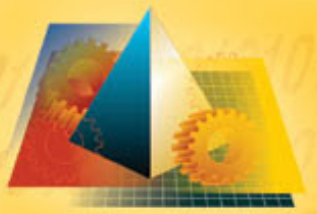

Clarion

ABC Library Reference

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Contents:

Foreword 45

Welcome 45
Documentation Conventions 46
Keyboard Conventions 46
Other Conventions 46

ABC Library Overview 47

About This Book 47
Application Builder Class (ABC) Library 47
Class Libraries Generally 47
Application Builder Classes—The ABCs of Rapid Application Development 47
ABC Library and the ABC Templates 51
ABC Coding Conventions 53
Method Names 53
Where to Initilize & Kill Objects 55
Return Values 55
PRIVATE (undocumented) Items 56
PROTECTED, VIRTUAL, DERIVED, and PROC Attributes 57
Documentation Conventions 58
Reference Item and Syntax Diagram 58
Property (short description of intended use) 58
Method (short description of what the method does) 58
Conceptual Example 60

ASCIIFileClass 61

ASCIIFileClass Overview 61
AsciiFileClass Properties 64
ASCIIFile (the ASCII file) 64
ErrorMgr (ErrorClass object) 64
OpenMode (file access/sharing mode) 64
AsciiFileClass Methods 65
ASCIIFileClass Functional Organization--Expected Use 65
FormatLine (a virtual to format text) 66
GetDOSFilename (let end user select file) 67
GetFilename (return the filename) 68
GetLastLineNo (return last line number) 69
GetLine (return line of text) 70
GetPercentile (convert file position to percentage:ASCIIFileClass) 71
Init (initialize the ASCIIFileClass object) 72
Kill (shut down the ASCIIFileClass object) 73
Reset (reset the ASCIIFileClass object) 74
SetLine (a virtual to position the file) 75
SetPercentile (set file to relative position) 76

ValidateLine (a virtual to implement a filter) 77

ASCIIPrintClass 79

ASCIIPrintClass Overview 79
AsciiPrintClass Properties 82
FileMgr (AsciiFileClass object:AsciiPrintClass) 82
PrintPreview (print preview switch) 82
Translator (TranslatorClass object:AsciiPrintClass) 82
AsciiPrintClass Methods 83
Ask (solicit print specifications) 83
Init (initialize the ASCIIPrintClass object) 84
PrintLines (print or preview specified lines) 85

ASCIISearchClass 87

ASCIISearchClass Overview 87
AsciiSearchClass Properties 90
Find (search constraints) 90
FileMgr (AsciiFileClass object:AsciiSearchClass) 91
LineCounter (current line number) 91
Translator (TranslatorClass object:ASCIISearchClass) 91
AsciiSearchClass Methods 92
Ask (solicit search specifications) 92
Init (initialize the ASCIISearchClass object) 93
Next (find next line containing search text) 94
Setup (set search constraints) 95

ASCIIViewerClass 97

ASCIIViewerClass Overview 97
AsciiViewerClass Properties 100
Popup (PopupClass object) 100
Printer (ASCIIPrintClass object) 100
Searcher (ASCIISearchClass object) 101
TopLine (first line currently displayed) 101
AsciiViewerClass Methods 102
AsciiViewerClass Functional Organization--Expected Use 102
AddItem (program the AsciiViewer object) 104
AskGotoLine (go to user specified line) 105
DisplayPage (display new page) 106
Init (initialize the ASCIIViewerClass object) 107
Kill (shut down the ASCIIViewerClass object) 109
PageDown (scroll down one page) 111
PageUp (scroll up one page) 112
Reset (reset the ASCIIViewerClass object) 113
SetLine (position to specific line) 114
SetLineRelative (move *n* lines) 115
SetTranslator (set run-time translator:ASCIIViewerClass) 116

TakeEvent (process ACCEPT loop event:ASCIIViewerClass) 117

BreakManagerClass 119

BreakManagerClass - Overview 119
BreakManagerClass - Concepts 119
BreakManagerClass - Relationship to Other Application Builder Classes 119
BreakManagerClass - ABC Template Implementation 119
BreakManagerClass - Source Files 120
BreakManagerClass - Conceptual Example 120
BreakManagerClass - Properties 123
BreakManagerClass - Methods 123
AddBreak (add a Break) 123
AddLevel (add a Level to the BreakId Break) 124
AddResetField (add a reset field to the last Level added) 125
AddTotal (add a total field to the last Level added) 126
Construct (automatic initialization of the BreakManager object) 127
Destruct (automatic destroy of the Breakmanager object) 127
Init (initialize the BreakManager object) 127
TakeEnd (Break closed) 128
TakeStart (Break opened) 129
UpdateTotal (Calculate Break totaling) 130

BrowseEIPManagerClass 131

BrowseEIPManagerClass--Overview 131
BrowseEIPManagerClass Concepts 132
BrowseEIPManagerClass--Relationship to Other Application Builder Classes 133
BrowseEIPManagerClass--ABC Template Implementation 133
BrowseEIPManagerClass Source Files 133
BrowseEIPManagerClass--Conceptual Example 134
BrowseEIPManagerClass Properties 137
BrowseEIPManagerClass Properties 137
BC (browse class) 137
BrowseEIPManagerClass Methods 138
BrowseEIPManagerClass--Functional Organization--Expected Use 138
ClearColumn (reset column property values) 139
Init (initialize the BrowseEIPManagerClass object) 140
Kill (shut down the BrowseEIPManagerClass object) 141
TakeCompleted (process completion of edit) 142
TakeNewSelection (reset edit-in-place column) 143

BrowseClass 145

BrowseClass Overview 145
BrowseClass Properties 150
BrowseClass Properties 150
ActiveInvisible (obscured browse list action) 150
AllowUnfilled (display filled list) 151

ArrowAction (edit-in-place action on arrow key) 152
AskProcedure (update procedure) 153
ChangeControl (browse change/update control number) 153
CurrentChoice (current LIST control entry number) 154
DeleteAction (edit-in-place action on delete key) 154
DeleteControl (browse delete control number) 154
EditList (list of edit-in-place controls) 155
EIP (edit-in-place manager) 155
EnterAction (edit-in-place action on enter key) 156
FocusLossAction (edit-in-place action on lose focus) 157
HasThumb (vertical scroll bar flag) 158
HideSelect (hide select button) 158
ILC(reference to IListControl interface) 158
InsertControl (browse insert control number) 159
ListQueue (browse data queue reference) 159
Loaded (browse queue loaded flag) 159
Popup (browse popup menu reference) 160
PrevChoice (prior LIST control entry number) 160
PrintControl (browse print control number) 160
PrintProcedure (print procedure) 161
Processors (reference to ProcessorQueue) 161
Query (reference to QueryClass) 161
QueryControl (browse query control number) 162
QueryShared (share query with multiple sorts) 162
QuickScan (buffered reads flag) 163
RetainRow (highlight bar refresh behavior) 164
SelectControl (browse select control number) 164
Selecting (select mode only flag) 165
SelectWholeRecord (select entire record flag) 165
Sort (browse sort information) 166
StartAtCurrent (initial browse position) 167
TabAction (edit-in-place action on tab key) 168
Toolbar (browse Toolbar object) 169
ToolbarItem (browse ToolbarTarget object) 170
ToolControl (browse toolbox control number) 171
ViewControl (view button) 171
Window (WindowManager object) 171
BrowseClass Methods 172
BrowseClass Methods 172
BrowseClass Functional Organization--Expected Use 172
AddEditControl (specify custom edit-in-place class) 174
AddField (specify a FILE/QUEUE field pair) 175
AddItem(program the BrowseClass object) 176
AddLocator (specify a locator) 176
AddResetField (set a field to monitor for changes) 177
AddSortOrder (specify a browse sort order) 178
AddToolbarTarget (set the browse toolbar) 179

ApplyRange (refresh browse based on resets and range limits) 180
Ask (update selected browse item) 181
AskRecord (edit-in-place selected browse item) 183
Fetch (get a page of browse items) 184
Init(initialize the BrowseClass object) 185
InitSort (initialize locator values) 186
Kill (shut down the BrowseClass object) 187
Next (get the next browse item) 188
NotifyUpdateError (throw error on update) 189
PostNewSelection (post an EVENT:NewSelection to the browse list) 190
Previous (get the previous browse item) 191
Records (return the number of browse queue items) 192
ResetFields(reinitialize FieldPairsClass) 192
ResetFromAsk (reset browse after update) 193
ResetFromBuffer (fill queue starting from record buffer) 195
ResetFromFile (fill queue starting from file POSITION) 196
ResetFromView (reset browse from current result set) 197
ResetQueue (fill or refill queue) 198
ResetResets (copy the Reset fields) 199
ResetSort (apply sort order to browse) 200
ScrollEnd (scroll to first or last item) 201
ScrollOne (scroll up or down one item) 202
ScrollPage (scroll up or down one page) 203
SetAlerts (alert keystrokes for list and locator controls) 204
SetLocatorField (set sort free element to passed field) 205
SetLocatorFromSort (use sort like locator field) 205
SetQueueRecord (copy data from file buffer to queue buffer:BrowseClass)..... 206
SetSort (apply a sort order to the browse) 207
TakeAcceptedLocator (apply an accepted locator value) 208
TakeEvent (process the current ACCEPT loop event:BrowseClass) 209
TakeKey (process an alerted keystroke:BrowseClass) 210
TakeNewSelection (process a new selection:BrowseClass) 211
TakeScroll (process a scroll event) 212
TakeVCRScroll (process a VCR scroll event) 213
UpdateBuffer (copy selected item from queue buffer to file buffer) 214
UpdateQuery (set default query interface) 215
UpdateResets (copy reset fields to file buffer) 216
UpdateThumb (position the scrollbar thumb) 217
UpdateThumbFixed (position the scrollbar fixed thumb) 218
UpdateViewRecord (get view data for the selected item) 219
UpdateWindow (update display variables to match browse) 220

BrowseQueue Interface..... 221

BrowseQueue Concepts 221
Relationship to Other Application Builder Classes 221
BrowseQueue Source Files 221
BrowseQueue Methods 222

Delete(remove entry in LIST queue) 222
Fetch(retrieve entry from LIST queue) 222
Free(clear contents of LIST queue) 222
GetViewPosition(retrieve VIEW position) 222
Insert(add entry to LIST queue) 223
Records(return number of records) 223
SetViewPosition(set VIEW position) 223
Update(update entry in LIST queue) 224
Who(returns field name) 224

BrowseToolbarClass 225

BrowseToolbarClass Overview 225
BrowseToolbarClass Concepts 225
Relationship to Other Application Builder Classes 225
BrowseToolbarClass ABC Template Implementation 225
BrowseToolbarClass Source Files 225
BrowseToolbarClass Properties 226
Browse (BrowseClass object) 226
Button (toolbar buttons FEQ values) 227
Window (WindowManager object) 227
BrowseToolbarClass Methods 228
Init (initialize the BrowseToolbarClass object) 228
InitBrowse (initialize the BrowseToolbarClass update buttons) 228
InitMisc (initialize the BrowseToolbarClass miscellaneous buttons) 229
InitVCR (initialize the BrowseToolbarClass VCR buttons) 230
ResetButton (synchronize toolbar with a corresponding browse control) 231
ResetFromBrowse(synchronize toolbar controls with browse controls) 232
TakeEvent(process the current event) 232

BufferedPairsClass 233

BufferedPairsClass Overview 233
BufferedPairsClass Properties 235
BufferedPairsClass Properties 235
RealList (recognized field pairs) 235
BufferedPairsClass Methods 236
BufferedPairsClass Methods 236
BufferedPairsClass Functional Organization Expected Use 236
AddPair (add a field pair:BufferedPairsClass) 238
AssignBufferToLeft (copy from "buffer" fields to "left" fields) 240
AssignBufferToRight (copy from "buffer" fields to "right" fields) 241
AssignLeftToBuffer (copy from "left" fields to "buffer" fields) 242
AssignRightToBuffer (copy from "right" fields to "buffer" fields) 243
EqualLeftBuffer (compare "left" fields to "buffer" fields) 244
EqualRightBuffer (compare "right" fields to "buffer" fields) 245
Init (initialize the BufferedPairsClass object) 246
Kill (shut down the BufferedPairsClass object) 247

ConstantClass 249

ConstantClass Overview 249
ConstantClass Properties 253
TerminatorField (identify the terminating field) 253
TerminatorInclude (include matching terminator record) 253
TerminatorValue (end of data marker) 254
ConstantClass Methods 255
ConstantClass Functional Organization--Expected Use 255
AddItem (set constant datatype and target variable) 256
Init (initialize the ConstantClass object) 257
Kill (shut down the ConstantClass object) 259
Next (load all constant items to file or queue) 260
Next (copy next constant item to targets) 262
Reset (reset the object to the beginning of the constant data) 263
Set (set the constant data to process) 264

Crystal8 Class 265

Crystal8 Class Properties 266
Crystal8 Methods 267
AllowPrompt (prompt for runtime parameter data) 267
CanDrillDown(allow Crystal drill down support) 268
HasCancelButton (display cancel button on report preview) 269
HasCloseButton (display close button on report preview) 270
HasExportButton (display export button on report preview) 271
HasLaunchButton (display launch button on report preview) 272
HasNavigationControls (display navigation controls on report preview) 273
HasPrintButton (display print button on report preview) 274
HasPrintSetupButton (display print setup button on report preview) 275
HasProgressControls (display progress controls on report preview) 276
HasRefreshButton (display refresh button on report preview) 277
HasSearchButton (display search button on report preview) 278
HasZoomControl (display zoom control on report preview) 279
Init (initialize Crystal8 object) 280
Kill (shut down Crystal8 object) 281
Preview (preview a Crystal Report) 282
_Print (print a Crystal Report) 283
Query (retrieve or set the SQL data query) 284
SelectionFormula (retrieve or set the Crystal formula) 285
ShowDocumentTips (show tips on docuement in the preview window) 286
ShowReportControls (show print controls) 287
ShowToolbarTips (show tips on preview window toolbar) 288

cwRTF Class 289

cwRTF Overview 289
cwRTF Class Concepts 289
cwRTF Relationship to Other Application Builder Classes 290

cwRTF ABC Template Implementation 290
cwRTF Source Files 290
cwRTF Properties 291
cwRTF Properties 291
hRTFWindow(RTF control handle) 291
cwRTF Methods 292
AlignParaCenter (center paragraph) 292
AlignParaLeft (left justify paragraph) 292
AlignParaRight (right justify paragraph) 292
ChangeFontStyle (set current font style) 293
CanRedo (check for redo data) 293
CanUndo (check for undo data) 294
Color (set text color) 294
Copy (copy selected text to clipboard) 294
Cut (cut selected text) 295
Find (set current font style) 295
FlatButtons (use flat button style) 296
Font (apply font attributes) 297
GetText (copy text to variable) 298
Init (initialize the cwRTF object) 299
IsDirty (indicates modified data) 300
Kill (shut down the csRTF object) 301
LeftIndent (indent the current or selected paragraph) 301
LimitTextSize (limit amount of text) 302
LoadField (load rich text data from field) 302
LoadFile (load rich text data from file) 303
NewFile (clear rich text data) 303
Offset (offset current or selected paragraph) 303
PageSetup (set page attributes) 304
ParaBulletsOff (turn off paragraph bullets) 304
ParaBulletsOn (turn on paragraph bullets) 304
Paste (paste text from clipboard) 305
_Print (print rich text control contents) 305
Redo (reapply action) 306
Replace (find and replace search) 306
ResizeControls (used internally) 306
RightIndent (indent the current or selected paragraph) 307
SaveField (save rich text data to field) 307
SaveFile (save rich text data to file) 308
SelectText (select characters) 308
SetDirtyFlag (set modified flag) 309
SetFocus (give rich text control focus) 309
SetText (place text into rich text control) 310
ShowControl (hide/unhide RTF control) 311
Undo (undo action) 311

DbAuditManager 313

DbAuditManager Overview 313
Relationship to Other Application Builder Classes 313
DbAuditManager ABC Template Implementation 313
DbAuditManager Source Files 313
DbAuditManager Properties 314
Action (log file action column) 314
ColumnInfo (log file column queue) 314
LogFiles (log file queue) 314
FM (DbLogFileManager object) 315
Errors (ErrorClass object) 315
DbAuditManager Methods 316
AddItem (maintain the columninfo structure) 316
AddLogFile (maintain log file structure) 317
AppendLog (initiate audit log file update) 317
BeforeChange (update audit log file before file change) 318
CreateHeader (create log file header records) 318
Init (initialize the DbAuditManager object) 319
Kill (shut down DbAuditManger object) 319
OnChange (update audit log file after a record change) 320
OnDelete (update audit log file when a record is deleted) 320
OnFieldChange (virtual method for each field change) 321
OnInsert (update audit log file when a record is added) 322
OpenLogFile (open the audit log file) 322
SetFM (determine log file status) 323

DbChangeManager 325

DbChangeManager Overview 325
Relationship to Other Application Builder Classes 325
DbChangeManager ABC Template Implementation 325
DbChangeManager Source Files 325
DbChangeManager Properties 326
NameQueue (pointer into trigger queue) 326
TriggerQueue (pointer to BFP for field changes) 326
DbChangeManager Methods 327
AddItem (maintain the namequeue structure) 327
AddThread (maintains the triggerqueue) 327
CheckChanges(check record for changes) 328
CheckPair(check field pairs for changes) 328
Equal(checks for equal before and after values) 329
Init (initialize the DbChangeManager object) 329
Kill (shut down DbChangeManger object) 330
SetThread (read triggerqueue) 330
Update (update the audit log file buffer) 331

DbLogFileManager 333

DbLogFileManager Overview 333
Relationship to Other Application Builder Classes 333
DbLogFileManager ABC Template Implementation 333
DbLogFileManager Source Files 333
DbLogFileManager Properties 334
DbLogFileManager Properties 334
Opened (file opened flag) 334
DbLogFileManager Methods 335
DbLogFileManager Methods 335
Init (initialize the DbLogFileManager object) 335

EditClass 337

EditClass Overview 337
EditClass Concepts 337
Relationship to Other Application Builder Classes 337
ABC Template Implementation 338
EditClass Source Files 338
EditClass Conceptual Example 339
EditClass Properties 343
FEQ (the edit-in-place control number) 343
ReadOnly (edit-in-place control is read-only) 343
EditClass Methods 344
Functional Organization--Expected Use 344
CreateControl (a virtual to create the edit control) 345
Init (initialize the EditClass object) 346
Kill (shut down the EditClass object) 347
SetAlerts (alert keystrokes for the edit control) 347
SetReadOnly (set edit control to read-only) 348
TakeAccepted (validate EIP field) 348
TakeEvent (process edit-in-place events) 349

EditSpinClass 351

EditSpinClass--Overview 351
EditSpinClass Concepts 351
EditSpinClass -- Relationship to Other Application Builder Classes 351
EditSpinClass--ABC Template Implementation 351
EditSpinClass--Conceptual Example 352
EditSpinClass Properties 355
EditSpinClass Properties 355
EditSpinClass Methods 356
EditSpinClass Methods 356
EditSpinClass--Functional Organization--Expected Use 356
CreateControl (create the edit-in-place SPIN control) 357

EditCheckClass 359

EditCheckClass Overview 359
EditCheckClass Concepts 359
EditCheckClass Relationship to Other Application Builder Classes 359
EditCheckClass ABC Template Implementation 359
EditCheckClass Source Files 359
EditCheckClass Conceptual Example 361
EditCheckClass Properties 364
EditCheckClass Methods 365
EditCheckClass Functional Organization—Expected Use 365
CreateControl (create the edit-in-place CHECK control) 366

EditColorClass 367

EditColorClassOverview 367
EditColorClass Concepts 367
EditColorClass Relationship to Other Application Builder Classes 367
EditColorClass ABC Template Implementation 367
EditColorClass Source Files 368
EditColorClass Conceptual Example 369
EditColorClass Properties 373
EditColorClass Properties 373
Title (color dialog title text) 373
EditColorClass Methods 374
EditColorClass Functional Organization--Expected Use 374
CreateControl (create the edit-in-place control) 375
TakeEvent (process edit-in-place events:EditColorClass) 376

EditDropComboClass 377

EditDropComboClass Overview 377
EditDropComboClass Concepts 377
Relationship to Other Application Builder Classes 377
EditDropComboClass ABC Template Implementation 377
EditDropComboClass Source Files 378
EditDropComboClass Conceptual Example 379
EditDropComboClass Properties 382
EditDropComboClass Methods 383
EditDropComboClass Functional Organization 383
CreateControl (create the edit-in-place COMBO control) 384

EditDropListClass 385

EditDropListClass Overview 385
EditDropListClass Concepts 385
EditDropListClass Relationship to Other Application Builder Classes 385
EditDropListClass ABC Template Implementation 385
EditDropListClass Source Files 385
EditDropListClass Conceptual Example 387

EditDropListClass Properties....390
EditDropListClass Properties....390
EditDropListClass Methods....391
EditDropListClass Functional Organization--Expected Use....391
CreateControl (create the edit-in-place DROPLIST control)....392
SetAlerts (alert keystrokes for the edit control:EditDropListClass)....393
SetReadOnly (set edit control to read-only:EditDropClass)....394
TakeEvent (process edit-in-place events:EditDropList Class)....395

EditEntryClass....397

EditEntryClass Overview....397
EditEntryClass Concepts....397
EditEntryClass Relationship to Other Application Builder Classes....397
EditEntryClass ABC Template Implementation....398
EditEntryClass Source Files....398
EditEntryClass Conceptual Example....398
EditEntryClass Properties....402
EditEntryClass Properties....402
EditEntryClass Methods....403
EditEntryClass Methods....403
EditEntryClass Functional Organization--Expected Use....403
CreateControl (create the edit-in-place ENTRY control)....404

EditFileClass....405

EditFileClass Overview....405
EditFileClass Concepts....405
EditFileClass Relationship to Other Application Builder Classes....405
EditFileClass ABC Template Implementation....405
EditFileClass Source Files....406
EditFileClass Conceptual Example....407
EditFileClass Properties....411
EditFileClass Properties....411
FileMask (file dialog behavior)....411
FilePattern (file dialog filter)....411
Title (file dialog title text)....412
EditFileClass Methods....413
EditFileClass Functional Organization--Expected Use....413
CreateControl (create the edit-in-place control:EditFileClass)....414
TakeEvent (process edit-in-place events:EditFileClass)....415

EditFontClass....417

EditFontClass Overview....417
EditFontClass Concepts....417
EditFontClass Relationship to Other Application Builder Classes....417
EditFontClass ABC Template Implementation....417
EditFontClass Source Files....418

EditFontClass Conceptual Example 419
EditFontClass Properties 423
EditFontClass Properties 423
Title (font dialog title text) 423
EditFontClass Methods 424
EditFontClass Methods 424
EditFontClass Functional Organization--Expected Use 424
CreateControl (create the edit-in-place control:EditFontClass) 425
TakeEvent (process edit-in-place events:EditFontClass) 426

EditMultiSelectClass 427

EditMultiSelectClass Overview 427
EditMultiSelectClass Concepts 427
EditMultiSelectClass Relationship to Other Application Builder Classes 427
EditMultiSelectClass ABC Template Implementation 428
EditMultiSelectClass Source Files 428
EditMultiSelectClass Conceptual Example 429
EditMultiSelectClass Properties 434
EditMultiSelectClass Properties 434
Title (font dialog title text:EditMultiSelectClass) 434
EditMultiSelectClass Methods 435
EditMultiSelectClass Methods 435
EditMultiSelectClass Functional Organization--Expected Use 435
AddValue (prime the MultiSelect dialog) 437
CreateControl (create the edit-in-place control:EditMultiSelectClass) 438
Reset (reset the EditMultiSelectClass object) 438
TakeAction (process MultiSelect dialog action) 439
TakeEvent (process edit-in-place events:EditMultiSelectClass) 442

EditTextClass 443

EditTextClass: Overview 443
EditTextClass Properties 445
Title (text dialog title text) 445
EditTextClass Methods 446
CreateControl (create the edit-in-place control:EditTextClass) 447
TakeEvent (process edit-in-place events:EditTextClass) 448

EIPManagerClass 449

EIPManagerClass--Overview 449
EIPManagerClass Concepts 449
EIPManagerClass--Relationship to Other Application Builder Classes 449
EIPManagerClass--ABC Template Implementation 450
EIPManagerClass Source Files 450
EIPManagerClass--Conceptual Example 451
EIPManagerClass Properties 454
Again (column usage flag) 454

Arrow (edit-in-place action on arrow key) 454
Column (listbox column) 454
Enter (edit-in-place action on enter key) 455
EQ (list of edit-in-place controls) 455
Fields (managed fields) 456
FocusLoss (action on loss of focus) 456
Insert (placement of new record) 457
ListControl (listbox control number) 458
LastColumn (previous edit-in-place column) 458
Repost (event synchronization) 459
RepostField (event synchronization field) 459
Req (database request) 460
SeekForward (get next field flag) 460
Tab (action on a tab key) 460
EIPManagerClass Methods 461
EIPManagerClass--Functional Organization--Expected Use 461
AddControl (register edit-in-place controls) 463
ClearColumn (reset column property values:EIPManagerClass) 464
GetEdit (identify edit-in-place field) 465
Init (initialize the EIPManagerClass object) 466
InitControls (initialize edit-in-place controls) 466
Kill (shut down the EIPManagerClass object) 467
Next (get the next edit-in-place field) 468
ResetColumn (reset edit-in-place object to selected field) 469
Run (run the EIPManager) 470
TakeAcceptAll (validate completed row) 470
TakeAction (process edit-in-place action) 471
TakeCompleted (process completion of edit:EIPManagerClass) 472
TakeEvent (process window specific events) 473
TakeFieldEvent (process field specific events) 474
TakeFocusLoss (a virtual to process loss of focus) 475
TakeNewSelection (reset edit-in-place column:EIPManagerClass) 476

EntryLocatorClass 477

EntryLocatorClass Overview 477
EntryLocatorClass Properties 481
EntryLocatorClass Properties 481
Shadow (the search value) 481
EntryLocatorClass Methods 482
GetShadow(return shadow value) 482
Init (initialize the EntryLocatorClass object) 483
Set (restart the locator:EntryLocatorClass) 484
SetShadow(set shadow value) 485
TakeAccepted (process an accepted locator value:EntryLocatorClass) 485
TakeKey (process an alerted keystroke:EntryLocatorClass) 486
Update (update the locator control and free elements) 487
UpdateWindow (redraw the locator control) 487

ErrorClass 489

ErrorClass Overview 489
Overview of ErrorClass changes in Clarion 6.1 489
ErrorClass Source Files 490
Multiple Customizable Levels of Error Treatment 491
Predefined Windows and Database Errors 492
Dynamic Extensibility of Errors 492
ErrorClass ABC Template Implementation 492
ErrorClass Relationship to Other Application Builder Classes 492
ErrorClass Macro Expansion 493
ErrorClass Multi-Language Capability 494
ErrorClass Conceptual Example 495
ErrorClass Properties 496
ErrorClass Properties 496
DefaultCategory (error category) 496
ErrorLog (errorlog interface) 497
Errors (recognized error definitions) 497
FieldName (field that produced the error) 498
FileName (file that produced the error) 498
History (error history structure) 498
HistoryResetOnView(clear error history log file) 499
HistoryThreshold (determine size of error history) 499
HistoryViewLevel (trigger error history) 499
KeyName (key that produced the error) 500
LogErrors (turn on error history logging) 500
MessageText (custom error message text) 500
Silent (silent error flag) 501
ErrorClass Methods 502
ErrorClass Functional Organization--Expected Use 502
AddErrors (add or override recognized errors) 504
AddHistory (update History structure) 505
GetCategory (retrieve error category) 505
GetDefaultCategory (get default error category) 505
GetError (Retrieve the current error message) 506
GetErrorcode (Retrieve the current Errorcode) 506
GetFieldName (get field that produced the error) 506
GetFileName (get file that produced the error) 507
GetHistoryResetOnView (get the error reset mode) 507
GetHistoryThreshold (get size of error history) 508
GetHistoryViewLevel (get error history viewing mode) 508
GetKeyName (get key name that produced the error) 509
GetLogErrors (get state of error log) 509
GetMessageText (get current error message text) 510
GetProcedureName (return procedure name) 510
GetSilent (get silent error flag) 511
HistoryMsg (initialize the message window) 511

Init (initialize the ErrorClass object) 512
Kill (perform any necessary termination code) 513
Message (display an error message) 514
Msg (initiate error message destination) 515
MessageBox (display error message to window) 516
RemoveErrors (remove or restore recognized errors) 517
ResetHistory(clear History structure) 518
SetCategory (set error category) 518
SetDefaultCategory (set default error category) 518
SetErrors (save the error state) 519
SetFatality (set severity level for a particular error) 520
SetField (set the substitution value of the %Field macro) 521
SetFieldName (set field name that produced the error) 521
SetFile (set the substitution value of the %File macro) 522
SetFileName (set the file that produced the error) 522
SetHistoryResetOnView (set error reset mode) 523
SetHistoryThreshold (set size of error history) 523
SetHistoryViewLevel (set error history viewing mode) 524
SetKey (set the substitution value of the %Key macro) 525
SetKeyName (set the key name that produced the error) 526
SetId (make a specific error current) 527
SetLogErrors (set error log mode) 528
SetMessageText (set the current error message text) 529
SetProcedureName (stores procedure names) 530
SetSilent (set silent error flag) 531
SubsString (resolves error message macros) 532
TakeBenign (process benign error) 533
TakeError (process specified error) 534
TakeFatal (process fatal error) 535
TakeNotify (process notify error) 536
TakeOther (process other error) 537
TakeProgram (process program error) 538
TakeUser (process user error) 539
Throw (process specified error) 540
ThrowFile (set value of %File, then process error) 541
ThrowMessage (set value of %Message, then process error) 542
ViewHistory (initiates the view of the current errors) 542

ErrorLogInterface 543

ErrorLogInterface Concepts 543
Relationship to Other Application Builder Classes 543
ErrorLogInterface Source Files 543
ErrorLogInterface Methods 544
ErrorLogInterface Methods 544
Close (initiate close of log file) 544
Open (method to initiate open of log file) 545
Take (update the log file) 545

FieldPairsClass 547

FieldPairsClass Overview 547
FieldPairsClass Properties 550
List (recognized field pairs) 550
FieldPairsClass Methods 551
FieldPairsClass Functional Organization--Expected Use 551
AddItem (add a field pair from one source field) 552
AddPair (add a field pair:FieldPairsClass) 553
AssignLeftToRight (copy from "left" fields to "right" fields) 555
AssignRightToLeft (copy from "right" fields to "left" fields) 556
ClearLeft (clear each "left" field) 557
ClearRight (clear each "right" field) 558
Equal (return 1 if all pairs are equal) 559
EqualLeftRight (return 1 if all pairs are equal) 560
Init (initialize the FieldPairsClass object) 560
Kill (shut down the FieldPairsClass object) 561

FileDropComboClass 563

Overview:FileDropComboClass 563
FileDropComboClass Properties 568
FileDropComboClass Properties 568
AskProcedure (update procedure) 568
ECOn (current state of entry completion) 568
EntryCompletion (automatic fill-ahead flag) 569
RemoveDuplicatesFlag (remove duplicate data) 569
UseField (COMBO USE variable) 570
FileDropComboClass Methods 571
FileDropComboClass Methods 571
FileDropComboClass Functional Organization--Expected Use 571
AddRecord (add a record filedrop queue) 573
Ask (add a record to the lookup file) 573
GetQueueMatch (locate a list item) 574
Init (initialize the FileDropComboClass object) 575
KeyValid (check for valid keystroke) 577
Kill (shut down the FileDropComboClass object) 577
ResetFromList (reset VIEW) 577
ResetQueue (refill the filedrop queue) 578
TakeAccepted (process accepted event) 579
TakeEvent (process the current ACCEPT loop event:FileDropComboClass) ... 579
TakeNewSelection (process NewSelection events:FileDropComboClass) 580
UniquePosition (check queue for duplicate record by key position) 581

FileDropClass 583

FileDropClass Overview 583
FileDropClass Properties 588
FileDropClass Properties 588

AllowReset (allow a reset) 588
DefaultFill (initial display value) 588
InitSyncPair (initial list position) 588
FileDropClass Methods 589
FileDropClass Methods 589
FileDropClass Functional Organization--Expected Use 589
AddField (specify display fields) 591
AddRecord (update filedrop queue) 592
AddUpdateField (specify field assignments) 592
Init (initialize the FileDropClass object) 593
Kill (shut down the FileDropClass object) 594
ResetQueue (fill filedrop queue) 595
SetQueueRecord (copy data from file buffer to queue buffer:FileDropClass) 596
TakeAccepted (a virtual to accept data) 596
TakeEvent (process the current ACCEPT loop event--FileDropClass) 597
TakeNewSelection (process EVENT:NewSelection events:FileDropClass) 598
ValidateRecord (a virtual to validate records) 599

FileManager 601

FileManager Overview 601
FileManager Properties 606
AliasedFile (the primary file) 606
Buffer (the record buffer) 607
Buffers (saved record buffers) 607
Create (create file switch) 608
Errors (the ErrorManager) 608
File (the managed file) 608
FileName (variable filename) 609
FileNameValue (constant filename) 610
LazyOpen (delay file open until access) 611
LockRecover (/RECOVER wait time parameter) 611
OpenMode (file access/sharing mode) 612
SkipHeldRecords (HELD record switch) 612
FileManager Methods 613
Naming Conventions and Dual Approach to Database Operations 613
FileManager Functional Organization--Expected Use 614
AddField(track fields in a structure) 616
AddKey (set the file's keys) 617
BindFields (bind fields when file is opened) 618
CancelAutoInc (undo PrimeAutoInc) 619
ClearKey (clear specified key components) 622
Close (close the file) 624
Deleted (return record status) 625
DeleteRecord (delete a record) 626
Destruct (automatic destructor) 627
EqualBuffer (detect record buffer changes) 628
Fetch (get a specific record by key value) 629

GetComponents (return the number of key components) 630
GetEOF (return end of file status) 631
GetError (return the current error ID) 632
GetField (return a reference to a key component) 633
GetFieldName (return a key component field name) 635
GetFields(get number of fields) 637
GetFieldPicture(get field picture) 637
GetFieldType(get field type) 637
GetName (return the filename) 638
Init (initialize the FileManager object) 639
Insert (add a new record) 641
KeyToOrder (return ORDER expression for a key) 642
Kill (shutdown the FileManager object) 644
Next (get next record in sequence) 645
Open (open the file) 646
Position (return the current record position) 647
PostDelete(trigger delete action post-processing) 648
PostInsert(trigger insert action post-processing) 649
PostUpdate(trigger update action post-processing) 650
PreDelete(trigger delete action pre-processing) 651
PreInsert(trigger insert action pre-processing) 652
PreUpdate(trigger update action pre-processing) 654
Previous (get previous record in sequence) 656
PrimeAutoInc (prepare an autoincremented record for adding) 657
PrimeFields (a virtual to prime fields) 659
PrimeRecord (prepare a record for adding:FileManager) 660
RestoreBuffer (restore a previously saved record buffer) 662
RestoreFile (restore a previously saved file state) 663
SaveBuffer (save a copy of the record buffer) 664
SaveFile (save the current file state) 665
SetError (save the specified error and underlying error state) 666
SetErrors (set the error class used) 667
SetKey (set current key) 668
SetName (set current filename) 669
Throw (pass an error to the error handler for processing) 671
ThrowMessage (pass an error and text to the error handler) 672
TryFetch (try to get a specific record by key value) 674
TryInsert (try to add a new record) 675
TryNext (try to get next record in sequence) 676
TryOpen (try to open the file) 677
TryPrevious (try to get previous record in sequence) 678
TryPrimeAutoInc (try to prepare an autoincremented record for adding) 679
TryReget (try to get a specific record by position) 681
TryUpdate (try to change the current record) 681
TryValidateField(validate field contents) 682
Update (change the current record) 683
UseFile (use LazyOpen file) 684

ValidateField (validate a field) 686
ValidateFields (validate a range of fields) 687
ValidateFieldServer(validate field contents) 688
ValidateRecord (validate all fields) 689

FilterLocatorClass 691

FilterLocatorClass Overview 691
FilterLocatorClass Properties 695
FilterLocatorClass Properties 695
FloatRight ("contains" or "begins with" flag) 695
FilterLocatorClass Methods 696
FilterLocatorClass Methods 696
TakeAccepted (process an accepted locator value:FilterLocatorClass) 696
UpdateWindow (apply the search criteria) 697

FuzzyClass 699

FuzzyClass Overview 699
Relationship to Other Application Builder Classes 699
FuzzyClass ABC Template Implementation 699
FuzzyClass Source Files 699
FuzzyClass Properties 700
FuzzyClass Methods 700
Construct (initialize FuzzyClass object) 700
Init (initialize FuzzyClass object) 700
Kill (shutdown FuzzyClass object) 700
Match (find query matches) 701
SetOption (set fuzzymatch options) 702

FormVCRClass 703

FormVCRClass Overview 703
FormVCRClass Concepts 703
FormVCRClass Relationship to Other Application Builder Classes 703
FormVCRClass ABC Template Implementation 703
FormVCRClass Source Files 704
FormVCRClass Properties 704
QuickScan (buffered reads flag) 704
Toolbar (FormVCR Toolbar object) 705
ToolbarItem (FormVCR ToolbarTarget object) 705
ViewPosition (store the current record position) 706
FormVCRClass Methods: 707
AddToolbarTarget (set the FormVCR toolbar) 707
Init (initialize the FormVCR object) 708
InitSort (initialize locator values) 708
Kill (shut down the FormVCR object) 709
CheckBorders (check for existence of records) 709
GetAction (return FormVCR action) 710

GetActionAllowed (validate a requested FormVCR action) 711
Next (get the next FormVCR item) 712
Previous (get the previous FormVCR item) 713
ResetSort (apply sort order to FormVCR) 713
SetAlerts (alert keystrokes for FormVCR controls) 714
SetRequestControl (assign field equates to FormVCR actions) 714
SetVCRControls (assign field equates to FormVCR scrolling) 715
SetSort (apply a sort order to the FormVCR group) 716
TakeAcceptedLocator (apply an accepted FormVCR locator value) 717
TakeEvent (process the current ACCEPT loop event) 717
TakeLocate (a FormVCR virtual to process each sort) 718
TakeScroll (process a FormVCR scroll event) 718
UpdateWindow (update display variables to match FormVCR action) 719

GraphClass 721

GraphClass Overview 721
Relationship to Other Application Builder Classes 721
GraphClass ABC Template Implementation 721
GraphClass Source Files 721
GraphClass Properties 722
eShowSBonFirstThread (display on base status bar) 722
eSumYMax (calculated maximum node value) 722
gShowDiagramName (show diagram name on target) 723
gShowDiagramNameV (show diagram value on target) 724
gShowMouse (show mouse coordinates on target) 725
gShowMouseX (show mouse X coordinate on target) 726
gShowMouseY (show mouse Y coordinate on target) 727
gShowNodeName (show node name on target) 728
gShowNodeNameV (show node name value on target) 729
gShowNodeValue (show node axis values on target) 730
gShowNodeValueX (show node x-axis value on target) 731
gShowNodeValueY (show node y-axis value on target) 732
GraphClass Methods 733
AllText (return full graph text information) 733
BeginRefresh (prepare drawing of graph class object) 733
CalcBestPositionNodeText (calculate graph text best fit position) 734
CalcCurrentGraph (calculates values for current graph type) 734
CalcCurrentNode (calculates values of current node) 735
CalcGraph (calculates all graph object values) 735
CalcPopup (create popup menu for graph object) 736
CalcPopupAdd2 (create popup menu item text for graph object) 737
DiagramNameText (create diagram name text) 738
DiagramText (create diagram name text with prompts) 738
DiagramNameText (create diagram name text) 739
DiagramText (create diagram name text with prompts) 739
Draw (calculate and draw GraphClass object) 740
DrawGraph (draws calculated values) 740

DrawReport (draw graph object on report) 741
DrawWallpaper (draw background wallpaper for graph object) 741
DrillDown (transfer control to new graph object) 742
FindNearbyNodes (locate nodes based on mouse position) 743
GetMouse (get mouse coordinates in all formats) 744
GetValueFromField (get contents of specified field) 745
GetValueFromStatusBar (return status bar zone contents) 745
ImageToWMF (Save object and return WMF file name) 746
Init (Initialize the graph object) 746
Interactivity (process mouse location data to tool tip or control 747
IsOverNode (is mouse over node location) 747
Kill (shut down the GraphClass object) 748
MouseText (creates text and mouse coordinate information) 748
MouseXText (generate X coordinate text only) 748
MouseYText (generate Y coordinate text only) 749
NodeNameText (generate current node name identifier) 749
NodeText (generate label, name, and node value) 750
NodeTipText (generate node information for tool tip) 750
NodeValueText (generate current node value text) 751
NodeXText (generate X node text value) 751
NodeYText (generate Y node text value) 752
Popup (GraphClass object popup menu manager) 752
PopupAsk (Display popup menu for graph object) 753
PostEvent (send an event to the GraphClass object) 754
PrintGraph (send graph object to printer) 756
Refresh (refresh drawing of GraphClass object) 757
Resize (conditional refresh when size changed) 757
ReturnFromDrillDown (transfer control to graph object after drilldown) 758
SaveAsGraph (save graph to WMF file selected) 759
SaveGraph (auto-save graph to WMF file) 759
SetDefault (initialize selected graph properties) 760
ShowOnField (show text contents to specified field) 760
ShowOnStatusBar (show text to status bar zone) 761
TakeEvent (process graph control events) 761
TakeEventofParent (process all graph events) 762
ToolTip (show all text to tool tips) 762
ToShowValues (show all composite text to all graph targets) 763

GridClass 765

GridClass Overview 765
Relationship to Other Application Builder Classes 765
GridClass ABC Template Implementation 765
GridClass Source Files 765
GridClass Properties 766
GridClass Properties 766
Children (reference to child group controls) 766
Chosen (current browse queue element) 766

ClickPress (forward control) 767
ControlBase (base control number) 767
ControlNumber (number of controls) 767
GroupColor (background color of group fields) 768
GroupControl (GROUP control number) 768
GroupTitle (title of group element) 768
SelColor (color of selected element) 769
Selectable (element selectable flag) 769
UpdateControl (file update trigger) 769
UpdateControlEvent 769
GridClass Methods 770
AddLocator (specify a locator) 770
FetchRecord (retrieve selected record) 770
GetAcross (number of horizontal grids) 771
GetClickPress (forward click control) 771
GetDown (number of vertical grids) 771
GetPosition (retrieve group control position) 772
IfGroupField (determine if current control is a GROUP) 772
Init (initialize the GridClass object) 773
IsSkelActive 773
Kill (shutdown the GridClass object) 774
SetAlerts (initialize and create child controls) 774
SyncGroup (initialize GROUP field properties) 774
TakeEvent (process the current ACCEPT loop event) 775
UpdateRecord (refresh BrowseGrid) 775
UpdateWindow (refresh window display) 775

HistHandlerClass 777

HistHandlerClass Source Files 777
HistHandlerClass Properties 777
Err (errorclass obejct) 777
History (error history structure) 777
LBColumns (number of listbox columns) 778
Win (reference to window) 778
HistHandlerClass Methods 779
Init (initialize the HistHandlerClass object) 779
TakeEvent (process window events) 779
VLBProc (retrieve LIST and error history information.) 780

IDbChangeAudit Interface 781

IDbChangeAudit Concepts 781
Relationship to Other Application Builder Classes 781
IDbChangeAudit Source Files 781
IDbChangeAudit Methods 781
BeforeChange (update audit log file before file change) 781
ChangeField (virtual method for managing field changes) 782

OnChange (update audit log file after a record change) 783

IListControl Interface 785

IListControl Concepts 785
Relationship to Other Application Builder Classes 785
IListControl Source Files 785
IListControl Methods 785
Choice(returns current selection number) 785
GetControl(returns control number) 786
GetItems(returns number of entries) 786
GetVisible(returns visibility of control) 786
SetChoice(change selected entry) 787
SetControl(change selected entry) 787

IncrementalLocatorClass 789

IncrementalLocatorClass Overview 789
IncrementalLocatorClass Properties 793
IncrementalLocatorClass Properties 793
IncrementalLocatorClass Methods 794
IncrementalLocatorClass Methods 794
SetAlerts (alert keystrokes for the LIST control:IncrementalLocatorClass) 794
TakeKey (process an alerted keystroke:IncrementalLocatorClass) 795

INIClass 797

INIClass Overview 797
INIClass Properties 800
INIClass Properties 800
FileName 800
INIClass Methods 801
Fetch (get INI file entries) 801
FetchField (return comma delimited INI file value) 803
FetchQueue (get INI file queue entries) 804
Init (initialize the INIClass object) 805
TryFetch (get a value from the INI file) 807
TryFetchField (return comma delimited INI file value) 808
Update (write INI file entries) 809

IReportGenerator Interface 811

IReportGenerator Interface 811
IReportGenerator Concepts 811
IReportGenerator Methods 811
AskProperties (pop up window to set properties) 811
CloseDocument (end document printing) 812
ClosePage (end a page print) 812
GetProperty (get a property value) 813
Init (initialize error class before printing) 813

OpenDocument (begin document printing) ... 814
OpenPage (begin a page print) ... 814
Opened (file opened flag) ... 814
ProcessArc (print an arc) ... 815
ProcessBand (begin/end report band processing) ... 816
ProcessCheck (print a checkbox) ... 816
ProcessChord (print a section of an ellipse) ... 817
ProcessEllipse (print an ellipse) ... 818
ProcessImage (print an image) ... 818
ProcessLine (print a line) ... 819
ProcessOption (print an option control) ... 819
ProcessRadio (print a radio button) ... 820
ProcessRectangle (print a box control) ... 820
ProcessString (print a string control) ... 821
ProcessText (print a text control) ... 821
SetProperty (set a property value) ... 822
WhoAmI (identify the report generator type) ... 822

LocatorClass ... 823

LocatorClass Overview ... 823
LocatorClass Properties ... 825
Control (the locator control number) ... 825
FreeElement (the locator's first free key element) ... 825
NoCase (case sensitivity flag) ... 826
ViewManager (the locator's ViewManager object) ... 826
LocatorClass Methods ... 827
GetShadow(return shadow value) ... 827
Init (initialize the LocatorClass object) ... 828
Reset (reset the locator for next search) ... 829
Set (restart the locator:LocatorClass) ... 830
SetAlerts (alert keystrokes for the LIST control:LocatorClass) ... 830
SetEnabled (enable or disable the locator control) ... 831
SetShadow (update shadow value) ... 831
TakeAccepted (process an accepted locator value:LocatorClass) ... 832
TakeKey (process an alerted keystroke:LocatorClass) ... 832
UpdateWindow (redraw the locator control with its current value) ... 833

MsgBoxClass ... 835

MsgBoxClass Overview ... 835
MsgBoxClass Source Files ... 835
MsgBoxClass Properties ... 836
ButtonTypes (standard windows buttons) ... 836
Caption (window title) ... 836
Err (errorclass object) ... 836
Icon (icon for image control) ... 836
HistoryHandler (windowcomponent interface) ... 837

MsgRVal (message box return value) 837
Style (font style) 837
Win (reference to window) 837
MsgBoxClass Methods 838
FetchFeq (retrieve button feq) 838
FetchStdButton (determine button pressed) 838
Init (initialize the MsgBoxClass object) 839
Kill (perform any necessary termination code) 839
SetupAdditionalFeqs (initialize additional control properties) 840
TakeAccepted (process accepted event) 840

PopupClass 841

PopupClass Overview 841
PopupClass Properties 845
ClearKeycode (clear KEYCODE character) 845
PopupClass Methods 846
PopupClass Functional Organization--Expected Use 846
AddItem (add menu item) 847
AddItemEvent (set menu item action) 849
AddItemMimic (tie menu item to a button) 850
AddMenu (add a menu) 851
AddSubMenu (add submenu) 852
Ask (display the popup menu) 853
DeleteItem (remove menu item) 854
DeleteMenu (remove a popup submenu) 855
GetItemChecked (return toggle item status) 856
GetItemEnabled (return item status) 857
GetItems(returns number of popup entries) 858
GetLastNumberSelection (get last menu item number selected) 858
GetLastSelection (return selected item) 859
Init (initialize the PopupClass object) 860
Kill (shut down the PopupClass object) 860
Restore (restore a saved menu) 861
Save (save a menu for restoration) 862
SetIcon (set icon name for popup menu item) 863
SetItemCheck (set toggle item status) 864
SetItemEnable (set item status) 865
SetLevel (set menu item level) 866
SetText (set menu item text) 867
SetToolbox (set menu item toolbox status) 868
SetTranslator (set run-time translator:PopupClass) 869
Toolbox (start the popup toolbox menu) 870
ViewMenu (popup menu debugger) 871

PrintPreviewClass 873

PrintPreviewClass Overview 873

PrintPreviewClass Properties 878
AllowUserZoom (allow any zoom factor) 878
ConfirmPages (force 'pages to print' confirmation) 878
CurrentPage (the selected report page) 879
Maximize (number of pages displayed horizontally) 879
PagesAcross (number of pages displayed horizontally) 879
PagesDown (number of vertical thumbnails) 880
PagesToPrint (the pages to print) 880
UserPercentile (custom zoom factor) 880
WindowPosSet (use a non-default initial preview window position) 881
WindowSizeSet (use a non-default initial preview window size) 881
ZoomIndex (index to applied zoom factor) 882
PrintPreviewClass Methods 883
PrintPreviewClass Functional Organization--Expected Use 883
AskPage (prompt for new report page) 884
AskPrintPages (prompt for pages to print) 885
AskThumbnails (prompt for new thumbnail configuration) 887
DeleteImageQueue (remove non-selected pages) 888
Display (preview the report) 889
Init (initialize the PrintPreviewClass object) 890
InPageList (check page number) 891
Kill (shut down the PrintPreviewClass object) 892
Open (prepare preview window for display) 893
SetINIManager (save and restore window coordinates) 894
SetPosition (set initial preview window coordinates) 895
SetZoomPercentile (set user or standard zoom factor) 896
SetDefaultPages (set the default pages to print) 897
SyncImageQueue (sync image queue with PagesToPrint) 897
TakeAccepted (process EVENT:Accepted events:PrintPreviewClass) 898
TakeEvent (process all events:PrintPreviewClass) 899
TakeFieldEvent (a virtual to process field events:PrintPreviewClass) 900
TakeWindowEvent (process non-field events:PrintPreviewClass) 901

ProcessClass 903

ProcessClass Overview 903
ProcessClass Properties 907
CaseSensitiveValue (case sensitive flag) 907
Percentile (portion of process completed) 907
PText (progress control number) 908
RecordsProcessed (number of elements processed) 908
RecordsToProcess (number of elements to process) 908
ProcessClass Methods 909
ProcessClass Functional Organization--Expected Use 909
Init (initialize the ProcessClass object) 911
Kill (shut down the ProcessClass object) 913
Next (get next element) 914
Reset (position to the first element) 915

SetProgressLimits (calibrate the progress monitor) 915
TakeLocate (a virtual to process each filter) 916
TakeRecord (a virtual to process each report record) 916

QueryClass 917

QueryClass Overview 917
QueryClass Concepts 917
QueryClass Relationship to Other Application Builder Classes 917
QueryClass ABC Template Implementation 918
QueryClass Source Files 918
QueryClass Conceptual Example 919
QueryClass Properties 922
QKCurrentQuery (popup menu choice) 922
QKIcon (icon for popup submenu) 922
QKMenuIcon (icon for popup menu) 922
QKSupport (quickqbe flag) 923
Window (browse window:QueryClass) 923
QueryClass Methods 924
QueryClass Functional Organization--Expected Use 924
AddItem (add field to query) 925
Ask (a virtual to accept query criteria) 927
ClearQuery (remove loaded query) 928
Delete (remove saved query) 929
GetFilter (return filter expression) 930
GetLimit (get searchvalues) 932
Init (initialize the QueryClass object) 933
Kill (shut down the QueryClass object) 934
Reset (reset the QueryClass object) 935
Restore (retrieve saved query) 936
Save (save a query) 937
SetLimit (set search values) 938
SetQuickPopup (add QuickQBE to browse popup) 940
Take (process QuickQBE popup menu choice) 941

QueryFormClass 943

QueryFormClass Overview 943
QueryFormClass Concepts 943
QueryFormClass Relationship to Other Application Builder Classes 943
QueryFormClass ABC Template Implementation 944
QueryFormClass Source Files 944
QueryFormClass Conceptual Example 945
QueryFormClass Properties 948
QueryFormClass Methods 949
QueryFormClass Functional Organization--Expected Use 949
Ask (solicit query criteria) 950
Init (initialize the QueryFormClass object) 951

Kill (shut down the QueryFormClass object) 952

QueryFormVisual 953

QueryFormVisual Overview 953
QueryFormVisual Concepts 953
QueryFormVisual Relationship to Other Application Builder Classes 953
QueryFormVisual ABC Template Implementation 953
QueryFormVisual Source Files 954
QueryFormVisual Conceptual Example 955
QueryFormVisual Properties 958
QFC (reference to the QueryFormClass) 958
QueryFormVisual Methods 959
QueryFormVisual Functional Organization--Expected Use 959
GetButtonFeq(returns a field equate label) 960
Init (initialize the QueryFormVisual object) 961
ResetFromQuery (reset the QueryFormVisual object) 962
SetText (set prompt text:QueryFormVisual) 963
TakeAccepted (handle query dialog Accepted events: QueryFormVisual) 964
TakeCompleted (complete the query dialog: QueryFormVisual) 965
TakeFieldEvent (a virtual to process field events:QueryFormVisual) 966
UpdateFields (process query values) 967

QueryListClass 969

QueryListClass--Overview 969
QueryListClass Concepts 969
QueryListClass--Relationship to Other Application Builder Classes 969
QueryListClass--ABC Template Implementation 969
QueryListClass Source Files 970
QueryListClass--Conceptual Example 971
QueryListClass Properties 974
QueryListClass Methods 975
QueryListClass--Functional Organization--Expected Use 975
Ask (solicit query criteria:QueryListClass) 976
Init (initialize the QueryListClass object) 977
Kill (shut down the QueryListClass object) 978

QueryListVisual 979

QueryListVisual--Overview 979
QueryListVisual Concepts 979
QueryListVisual--Relationship to Other Application Builder Classes 979
QueryListVisual--ABC Template Implementation 979
QueryListVisual Source Files 979
QueryListVisual--Conceptual Example 981
QueryListVisual Properties 984
QFC (reference to the QueryListClass) 984
OpsEIP (reference to the EditDropListClass) 984

FldsEIP (reference to the EditDropListClass) 984
ValueEIP(reference to QEditEntryClass) 985
QueryListVisual Methods 986
QueryListVisual--Functional Organization--Expected Use 986
Init (initialize the QueryListVisual object) 987
Kill (shutdown the QueryListVisual object) 988
ResetFromQuery (reset the QueryList Visual object) 989
SetAlerts (alert keystrokes for the edit control:QueryListVisual) 990
TakeAccepted (handle query dialog EVENT:Accepted events) 991
TakeCompleted (complete the query dialog) 992
TakeEvent (process edit-in-place events:QueryListVisual) 993
TakeFieldEvent (a virtual to process field events:QueryListVisual) 994
UpdateControl(updates the edit-in-place entry control) 995
UpdateFields (process query values) 995

QueryVisualClass 997

QueryVisualClass: Overview 997
QueryVisualClass Properties 998
QC (reference to the QueryClass) 998
Resizer (reference to the WindowResizeClass:QueryVisualClass) 998
QueryVisualClass Methods 999
Init (initialize the QueryVisual object) 999
Kill (shut down the QueryVisual object) 1000
Reset (reset the dialog for display:QueryVisualClass) 1001
TakeAccepted (handle query dialog EVENT:Accepted events) 1002
TakeFieldEvent (a virtual to process field events:QueryVisualClass) 1003
TakeWindowEvent (a virtual to process non-field events:QueryVisualClass) 1004

RelationManager 1005

RelationManager Overview 1005
RelationManager Properties 1010
RelationManager Properties 1010
Me (the primary file's FileManager object) 1010
UseLogout (transaction framing flag) 1010
RelationManager Methods 1011
RelationManager Functional Organization--Expected Use 1011
AddRelation (set a file relationship) 1012
AddRelationLink (set linking fields for a relationship) 1014
CancelAutoInc (undo autoincrement) 1016
Close (close a file and any related files) 1017
Delete (delete record subject to referential constraints) 1018
GetNbFiles(returns number of children) 1019
GetNbRelations(returns number of relations) 1019
GetRelation(returns reference to relation manager) 1020
GetRelationType(returns relation type) 1020
Init (initialize the RelationManager object) 1021

Kill (shut down the RelationManager object) 1022
ListLinkingFields (map pairs of linked fields) 1023
Open (open a file and any related files) 1024
Save (copy the current record and any related records) 1024
SetAlias (set a file alias) 1025
SetQuickScan (enable QuickScan on a file and any related files) 1026
Update (update record subject to referential constraints) 1027

ReportManager Class 1029

ReportManager Overview 1029
ReportManager Concepts 1029
ReportManager Properties 1034
Attribute (ReportAttributeManager object) 1034
BreakMan (BreakManagerClass object) 1034
DeferOpenReport (defer open) 1035
DeferWindow (defer progress window) 1035
KeepVisible (keep progress window visible) 1036
OutputFileQueue (advanced report generation filenames) 1036
Preview (PrintPreviewClass object) 1037
PreviewQueue (report metafile pathnames) 1037
Process (ProcessClass object) 1038
QueryControl (query button) 1038
Report (the managed REPORT) 1039
ReportTarget (IReportGenerator interface) 1039
SkipPreview (print rather than preview) 1039
TargetSelector (ReportTargetSelectorClass object) 1040
TargetSelectorCreated (report target active) 1040
WaitCursor (activate Wait cursor during report processing) 1041
WMFParser (WMFDocumentParser object) 1041
Zoom (initial report preview magnification) 1042
ReportManager Methods 1043
ReportManager Functional Organization--Expected Use 1043
AddItem (program the ReportManager object) 1044
Ask (display window and process its events:ReportManager) 1044
AskPreview (preview or print the report) 1045
CancelPrintReport (cancel report printing) 1046
EndReport (close the report) 1047
Kill (shut down the ReportManager object) 1049
Next (get next report record) 1050
Open (a virtual to execute on EVENT:OpenWindow--ReportManager) 1051
OpenReport (prepare report for execution) 1052
PrintReport (print the report) 1053
ProcessResultFiles (process generated output files) 1054
SetReportTarget (set ReportGenerator target) 1055
SetStaticControlsAttributes (set report's static controls) 1055
SetDynamicControlsAttributes (set report's static controls) 1056
TakeAccepted (process Accepted event) 1056

TakeCloseEvent (a virtual to process EVENT:CloseWindow) 1057
TakeNoRecords (process empty report) 1058
TakeRecord(process each record) 1058
TakeWindowEvent (a virtual to process non-field events:ReportManager) ... 1059

RuleManager 1061

Overview 1061
RuleManager Concepts 1061
RuleManager ABC Template Implementation 1063
Implementation Steps using hand code 1068
Rule Class Properties 1070
Rule Class Methods 1071
SetGlobalRule (post address to GlobalRule) 1073
ResetGlobalRule (clear address in GlobalRule) 1074
RuleIsBroken (test rule and return result) 1075
SetIndicator (set error indicator) 1076
RulesCollection Class Properties 1077
RulesCollection Class Methods 1077
Construct (initialize RulesCollection object) 1077
Destruct (shut down RulesCollection object) 1078
RuleCount (count rules in the collection) 1078
BrokenRuleCount (count rules in the collection which are broken) 1078
AddRule (add a rule to this collection) 1079
AddControl (add managed control) 1080
AddControlToRule (add managed control) 1081
CheckRule (check a particular rule) 1082
CheckAllRules (check all rules in this collection) 1082
Item (locate a particular rule) 1083
TakeAccepted (handle acceptance of error indicators) 1084
SetEnumerateIcons (set icons for broken rules display) 1085
EnumerateBrokenRules (display a list of rules with status of each) 1086
SetControlsStatus (set status of managed controls) 1087
NeedChangeControlStatus (check if control status needs to change) 1088
RulesManager Properties 1089
RulesManager Methods 1089
Construct (initialize RulesManager object) 1089
Destruct (shut down RulesManager object) 1089
RulesManagerCount (count rules in the collection) 1090
BrokenRulesCount (count rules in the collection which are broken) 1090
AddRulesCollection (add a rule to this collection) 1091
CheckAllRules (check all rules in all collections) 1091
TakeAccepted (handle acceptance of error indicators) 1092
SetEnumerateIcons (set icons for broken rules display) 1093
EnumerateBrokenRules (display a list of rules with status of each) 1094
SetControlsStatus (set status of managed controls) 1095

SelectFileClass 1097

SelectFileClass Concepts 1097
SelectFileClass Properties 1100
DefaultDirectory (initial path) 1100
DefaultFile (initial filename/filemask) 1100
Flags (file dialog behavior) 1101
WindowTitle (file dialog title text) 1101
SelectFileClass Methods 1102
AddMask (add file dialog file masks) 1102
Ask (display Windows file dialog) 1103
Init (initialize the SelectFileClass object) 1104
SetMask (set file dialog file masks) 1105

StandardBehavior Class 1107

StandardBehavior Overview 1107
StandardBehavior Class Concepts 1107
Relationship to Other Application Builder Classes 1107
StandardBehavior Source Files 1107
StandardBehavior Properties 1108
StandardBehavior Methods 1109
StandardBehavior Methods 1109
Init(initialize the StandardBehavior object) 1109

StandardErrorLogClass 1111

StandardErrorLogClass Overview 1111
StandardErrorLogClass Source Files 1111
ABC Template Implementation 1111
StandardErrorLogClass Properties 1112
StandardErrorLogClass Methods 1113
Close (close standarderrorlog file) 1113
Construct (initialize StandardErrorLogClass object) 1113
Destruct (remove the StandardErrorLogClass object) 1113
Open (open standarderrorlog file) 1114

StepClass 1115

StepClass Overview 1115
StepClass Properties 1117
Controls (the StepClass sort sequence) 1117
StepClass Methods 1118
GetPercentile (return a value's percentile:StepClass) 1118
GetValue (return a percentile's value:StepClass) 1119
Init (initialize the StepClass object) 1120
Kill (shut down the StepClass object) 1121
SetLimit (set smooth data distribution:StepClass) 1122
SetLimitNeeded (return static/dynamic boundary flag:StepClass) 1123

StepCustomClass 1125

StepCustomClass Overview 1125
StepCustomClass Properties 1129
Entries (expected data distribution) 1129
StepCustomClass Methods 1130
StepCustomClass Methods 1130
AddItem (add a step marker) 1130
GetPercentile (return a value's percentile:StepCustomClass) 1131
GetValue (return a percentile's value:StepCustomClass) 1132
Init (initialize the StepCustomClass object) 1133
Kill (shut down the StepCustomClass object) 1134

StepLongClass 1135

StepLongClass Overview 1135
StepLongClass Properties 1138
Low (lower boundary:StepLongClass) 1138
High (upper boundary:StepLongClass) 1138
StepLongClass Methods 1139
GetPercentile (return a value's percentile:StepLongClass) 1139
GetValue (return a percentile's value:StepLongClass) 1140
SetLimit (set smooth data distribution:StepLongClass) 1141

StepLocatorClass 1143

StepLocatorClass Overview 1143
StepLocatorClass Properties 1146
StepLocatorClass Methods 1147
StepLocatorClass Methods 1147
Set (restart the locator:StepLocatorClass) 1147
TakeKey (process an alerted keystroke:StepLocatorClass) 1148

StepRealClass 1149

StepRealClass Overview 1149
StepRealClass Properties 1152
StepRealClass Properties 1152
Low (lower boundary:StepRealClass) 1152
High (upper boundary:StepRealClass) 1152
StepRealClass Methods 1153
StepRealClass Methods 1153
GetPercentile (return a value's percentile:StepRealClass) 1153
GetValue (return a percentile's value:StepRealClass) 1154
SetLimit (set smooth data distribution:StepRealClass) 1155

StepStringClass 1157

StepStringClass Overview 1157
StepStringClass Properties 1162
LookupMode (expected data distribution) 1162

Root (the static portion of the step) 1163
SortChars (valid sort characters) 1163
TestLen (length of the static step portion) 1164
StepStringClass Methods 1165
GetPercentile (return a value's percentile) 1165
GetValue (return a percentile's value) 1166
Init (initialize the StepStringClass object) 1167
Kill (shut down the StepStringClass object) 1168
SetLimit (set smooth data distribution:StepStringClass) 1169
SetLimitNeeded (return static/dynamic boundary flag:StepStringClass) 1170

TagHTMLHelp Class 1171

TagHTMLHelpOverview 1171
TagHTMLHelp Class Concepts 1171
Relationship to Other Application Builder Classes 1171
TagHTMLHelp ABC Template Implementation 1171
TagHTMLHelp Source Files 1171
TagHTMLHelp Methods 1172
AlinkLookup (associative link lookup) 1172
CloseHelp (close HTML help file) 1173
GetHelpFile (get help file name) 1173
GetTopic (get current topic name) 1173
Init (initialize HTML Help object) 1174
KeyWordLookup (lookup keyword) 1175
Kill (shutdown the TagHTMLHelp object) 1175
SetHelpFile (set the current HTML Help file name) 1176
SetTopic (set the current HTML Help file topic) 1177
ShowIndex (open the HTML Help index tab) 1177
ShowSearch (open the HTML Help search tab) 1178
ShowTOC (open the HTML Help contents tab) 1178
ShowTopic (display a help topic) 1178

TextWindowClass 1179

TextWindowClass Overview 1179
TextWindowClass Concepts 1179
Relationship to Other Application Builder Classes 1179
ABC Template Implementation 1179
TextWindowClass Source Files 1179
TextWindowClass Properties 1180
SelE (ending edit position) 1180
SelS (starting edit position) 1180
Txt (field equate number) 1180
TextWindowClass Methods 1181
Init (initalize TextWindow object) 1181
Kill (shutdown TextWindow object) 1181
TakeAccepted (process window controls) 1182

ToolbarClass 1183

ToolbarClass Overview 1183
ToolbarClass Methods 1190
ToolbarClass Functional Organization--Expected Use 1190
AddTarget (register toolbar driven entity) 1191
DisplayButtons (enable appropriate toolbar buttons:ToolbarClass) 1192
Init (initialize the ToolbarClass object) 1193
Kill (shut down the ToolbarClass object) 1193
SetTarget (sets the active target) 1194
TakeEvent (process toolbar event:ToolbarClass) 1195

ToolbarListBoxClass 1197

ToolbarListBoxClass Overview 1197
ToolbarListboxClass Properties 1202
Browse (BrowseClass object) 1202
ToolbarListboxClass Methods 1203
DisplayButtons (enable appropriate toolbar buttons:ToolbarListboxClass) 1203
TakeEvent (convert toolbar events:ToolbarListboxClass) 1204
TakeToolbar (assume contol of the toolbar) 1205
TryTakeToolbar (return toolbar control indicator:ToolbarListBoxClass) 1206

ToolbarReltreeClass 1207

ToolbarReltreeClass Overview 1207
ToolbarReltreeClass Properties 1212
ToolbarReltreeClass Methods 1213
DisplayButtons (enable appropriate toolbar buttons:ToolbarReltreeClass) 1213
TakeToolbar (assume control of the toolbar:ToolbarReltreeClass) 1214

ToolbarTargetClass 1215

ToolbarTarget Overview 1215
ToolbarTarget Properties 1217
ChangeButton (change control number) 1217
Control (window control) 1217
DeleteButton (delete control number) 1218
HelpButton (help control number) 1218
InsertButton (insert control number) 1219
LocateButton(query control number) 1219
SelectButton (select control number) 1220
ToolbarTarget Methods 1221
ToolbarTarget Functional Organization--Expected Use 1221
DisplayButtons (enable appropriate toolbar buttons:ToolbarTarget) 1222
TakeEvent (convert toolbar events:ToolbarTarget) 1223
TakeToolbar (assume control of the toolbar:ToolbarTarget) 1225
TryTakeToolbar (return toolbar control indicator:ToolbarTarget) 1225

ToolbarUpdateClass 1228

ToolbarUpdateClass Overview 1228
ToolbarUpdateClass Properties 1236
Request (requested database operation) 1236
History (enable toolbar history button) 1237
ToolbarUpdateClass Methods 1238
DisplayButtons (enable appropriate toolbar buttons:ToolbarUpdateClass) 1238
TakeEvent (convert toolbar events:ToolbarUpdateClass) 1239
TakeToolbar (assume control of the toolbar:ToolbarUpdateClass) 1240
TryTakeToolbar (return toolbar control indicator:ToolbarUpdateClass) 1241

TransactionManagerClass 1242

Overview 1242
TransactionManager Concepts 1242
TransactionManager ABC Template Implementation 1242
TransactionManager Relationship to Other Application Builder Classes 1243
TransactionManager Source Files 1243
TransactionManager Conceptual Example 1243
TransactionManager Properties 1245
TransactionManager Methods 1246
AddItem (add a RelationManager to transaction list) 1247
Finish (rollback or commit transaction) 1248
Process (a virtual to process transaction) 1249
Reset (remove all RelationManagers from transaction list) 1250
RestoreLogout (restore all RelationManagers in transaction list to previous logout status) 1251
Run (initiates transaction sequence) 1252
SetLogoutOff (turn off logout for all RelationManagers in transaction list) 1253
SetTimeout (set timeout used in transaction) 1254
Start (start the transaction) 1255
TransactionCommit (commit the transaction) 1257
TransactionRollBack (rollback the transaction) 1258

TranslatorClass 1259

TranslatorClass Overview 1259
TranslatorClass Properties 1264
ExtractText (identify text to translate) 1264
TranslatorClass Methods 1265
AddTranslation (add translation pairs) 1265
Init (initialize the TranslatorClass object) 1267
Kill (shut down the TranslatorClass object) 1267
TranslateControl (translate text for a control) 1268
TranslateControls (translate text for range of controls) 1269
TranslateString (translate text) 1270
TranslateWindow (translate text for a window) 1271

ViewManager 1273

ViewManager Overview 1273
ViewManager Properties 1278
Order (sort, range-limit, and filter information) 1278
PagesAhead (buffered pages) 1279
PagesBehind (buffered pages) 1279
PageSize (buffer page size) 1280
Primary (the primary file RelationManager) 1280
SavedBuffers (saved record buffers) 1281
TimeOut (buffered pages freshness) 1282
View (the managed VIEW) 1282
ViewManager Methods 1283
ViewManager Functional Organization--Expected Use 1283
AddRange (add a range limit) 1285
AddSortOrder (add a sort order) 1286
AppendOrder (refine a sort order) 1287
ApplyFilter (range limit and filter the result set) 1288
ApplyOrder (sort the result set) 1289
ApplyRange (conditionally range limit and filter the result set) 1290
Close (close the view) 1291
GetFirstSortField (return first field of current sort) 1291
GetFreeElementName (return free key element name) 1292
GetFreeElementPosition (return free key element position) 1293
Init (initialize the ViewManager object) 1294
Kill (shut down the ViewManager object) 1295
Next (get the next element) 1295
Open (open the view) 1296
Previous (get the previous element) 1297
PrimeRecord (prepare a record for adding:ViewManager) 1298
Reset (reset the view position) 1299
RestoreBuffers (restore VIEW file buffers) 1300
SaveBuffers (save VIEW file buffers) 1300
SetFilter (add, change, or remove active filter) 1301
SetOrder (replace a sort order) 1303
SetSort (set the active sort order) 1304
UseView (use LazyOpen files) 1305
ValidateRecord (validate an element) 1306

WindowComponent Interface 1307

WindowComponent Overview 1307
WindowComponent Concepts 1307
Relationship to Other Application Builder Classes 1307
WindowComponent Source Files 1307
WindowComponent Methods 1308
WindowComponent Methods 1308
Kill(shutdown the parent object) 1308

PrimaryBufferRestored(confirm restore of primary buffer) 1309
PrimaryBufferRestoreRequired(flag restore of primary buffer) 1309
PrimaryBufferSaved(confirm save of primary buffer) 1310
PrimaryBufferSaveRequired(flag save of primary buffer) 1310
Reset(reset object's data) 1311
ResetRequired(determine if screen refresh needed) 1312
SetAlerts(alert keystrokes for window component) 1313
TakeEvent(process the current ACCEPT loop event) 1313
Update(get VIEW data for the selected item) 1314
UpdateWindow(update window controls) 1314

WindowResizeClass 1315

WindowResizeClass Overview 1315
WindowResizeClass Properties 1319
AutoTransparent (optimize redraw) 1319
DeferMoves (optimize resize) 1319
WindowResizeClass Methods 1320
WindowResizeClass Functional Organization--Expected Use 1320
GetParentControl (return parent control) 1321
GetPositionStrategy (return position strategy for a control type) 1322
GetResizeStrategy (return resize strategy for a control type) 1323
Init (initialize the WindowResizeClass object) 1324
Kill (shut down the WindowResizeClass object) 1327
Reset (resets the WindowResizeClass object) 1328
Resize (resize and reposition controls) 1329
RestoreWindow (restore window to initial size) 1330
SetParentControl (set parent control) 1331
SetParentDefaults (set default parent controls) 1332
SetStrategy (set control resize strategy) 1333

WindowManager 1335

WindowManager Overview 1335
WindowManager Properties 1343
AutoRefresh (reset window as needed flag) 1343
AutoToolbar (set toolbar target on new tab selection) 1343
CancelAction (response to cancel request) 1344
ChangeAction (response to change request) 1345
Dead (shut down flag) 1345
DeleteAction (response to delete request) 1346
Errors (ErrorClass object) 1347
FilesOpened(files opened by procedure) 1347
FirstField (first window control) 1347
ForcedReset (force reset flag) 1348
HistoryKey (restore field key) 1348
InsertAction (response to insert request) 1349
LastInsertedPosition (hold position of last inserted record) 1349

MyWindow (the Managed WINDOW) 1350
OKControl (window acceptance control--OK button) 1350
Opened (window opened flag) 1350
OriginalRequest (original database request) 1351
OwnerWindow (the Managed owner WINDOW) 1351
Primary (RelationManager object) 1351
Request (database request) 1353
ResetOnGainFocus (gain focus reset flag) 1354
Resize (WindowResize object) 1354
Response (response to database request) 1355
Saved (copy of primary file record buffer) 1355
Translator (TranslatorClass object:WindowManager) 1356
VCRRequest (delayed scroll request) 1356
WindowManager Methods 1357
WindowManager Functional Organization--Expected Use 1357
AddHistoryField (add restorable control and field) 1359
AddHistoryFile (add restorable history file) 1360
AddItem (program the WindowManager object) 1361
AddUpdateFile (register batch add files) 1362
Ask (display window and process its events:WindowManager) 1363
ChangeRecord(execute change record process) 1364
DeleteRecord(execute delete record process) 1365
Init (initialize the WindowManager object) 1366
InsertRecord (execute insert record activity) 1368
Kill (shut down the WindowManager object) 1369
Open (open and initialize a window structure) 1370
PostCompleted (initiates final Window processing) 1372
PrimeFields (a virtual to prime form fields) 1373
PrimeUpdate (update or prepare for update) 1374
RemoveItem(remove WindowComponent object) 1375
Reset (reset the window for display) 1376
RestoreField (restore field to last saved value) 1377
Run (run this procedure or a subordinate procedure) 1378
SaveHistory (save history fields for later restoration) 1380
SaveOnChangeAction(execute change record process and remain active) ... 1381
SaveOnInsertAction(execute insert record activity and remain active) 1382
SetAlerts (alert window control keystrokes) 1383
SetResponse (OK or Cancel the window) 1384
TakeAccepted (a virtual to process EVENT:Accepted--WindowManager) 1385
TakeCloseEvent (a virtual to Cancel the window) 1386
TakeCompleted (a virtual to complete an update form) 1388
TakeEvent (a virtual to process all events:WindowManager) 1390
TakeFieldEvent (a virtual to process field events:WindowManager) 1391
TakeNewSelection (a virtual to process EVENT:NewSelection) 1392
TakeNotify (a virtual to process EVENT:Notify) 1393
See Also: NOTIFICATION, NOTIFY 1393
TakeRejected (a virtual to process EVENT:Rejected) 1394

TakeSelected (a virtual to process EVENT:Selected) 1395
TakeWindowEvent (a virtual to process non-field events:WindowManager) . 1396
Update (prepare records for writing to disk) 1397

Index: 1399

Foreword

Welcome

Welcome to the Application Builder Class Library Reference! This book is designed to be your every day reference to the Classes that lie beneath the templates.

Once you've become familiar with the Clarion development environment, through *Getting Started*, *Learning Clarion* and the *Online User's Guide*, you will refer to those books less and less frequently. However, in your day-to-day work, we think you will continue to need information on the finer points of the various Application Builder Class methods.

That's why we created this Application Builder Class Library Reference —for every Clarion developer who wants a quick, ready reference to those Clarion components you use over and over again.

This book provides in-depth discussions of the ABC Library. It shows you how the ABC Templates use the powerful ABC Library objects—and how you can use, reuse, and modify the classes with the ABC Templates or within your hand-coded project.

These are the tools you'll continue to refer to regardless of your expertise with Clarion. The depths of information on these tools and the consequent versatility you can achieve with them is virtually unlimited.

Documentation Conventions

Typeface Conventions

Italics	Indicates what to type at the keyboard and variable information, such as *Enter This* or *filename*.TXT. Also identifies the title information of dialog windows, like *Procedure Properties*.
CAPS	Indicates keystrokes to enter at the keyboard such as ENTER or ESCAPE, and mouse operations such as RIGHT-CLICK.
Boldface	Indicates commands or options from a menu or text in a dialog window.
UPPERCASE	Clarion language keywords such as MAX or USE.
`Courier New`	Used for diagrams, source code listings, to annotate examples, and for examples of the usage of source statements.

Keyboard Conventions

F1	Indicates a single keystroke. In this case, press and release the F1 key.
ALT+X	Indicates a combination of keystrokes. In this case, hold down the ALT key and press the X key, then release both keys.

Other Conventions

Special Tips, Notes, and Warnings—information that is not immediately evident from the topic explanation.

ABC Library Overview

About This Book

This book describes the Application Builder Class (ABC) Library.

It provides an overview of each class or related group of classes. Then it provides specific information on the public properties and methods of each class, plus examples for using them. It also shows you the source files for each class and describes some of the relationships between the classes.

Application Builder Class (ABC) Library

Class Libraries Generally

The purpose of a class library in an Object Oriented system is to help programmers work more efficiently by providing a safe, efficient way to reuse pieces of program code. In other words, a class library should relieve programmers of having to write certain routines by letting them use already written generic routines to perform common or repetitive program tasks.

In addition, a class library can reduce the amount of programming required to implement changes to an existing class based program. By deriving classes that incrementally add to or subtract from the classes in the library, programmers can accomplish substantial changes without having to rewrite the base classes or the programs that rely on the base classes.

Application Builder Classes—The ABCs of Rapid Application Development

Typical Reusability and Maintenance Benefits

The Application Builder Classes (ABC Library) provide all the benefits of class libraries in general. Clarion's ABC Templates automatically generate code that uses and reuses the robust, flexible, and solid (pre-tested) objects defined by the ABC Library. Further, the templates are designed to help you easily derive your own classes based on the ABC Library.

Of course, you need not use the templates to use the Application Builder Classes. However, the template generated code certainly provides appropriate examples for using the ABC Library in hand coded programs. Either way, the bottom line for you is more powerful programs with less coding.

Database and Windows Program Orientation

The Application Builder Classes have a fairly specific focus or scope. That is, *its objects are designed to process databases within a Windows environment*. Even more specifically, these objects are designed to support all the standard functionality provided by prior versions of Clarion, plus a lot more.

As such, there are database related objects that open, read, write, view, search, sort, and print data files. There are objects that enforce relational integrity between related data files.

In addition there are general purpose Windows related objects that display error messages, manage popup menus, perform edit-in-place, manage file-loaded drop-down lists, perform language translation on windows, resize windows and controls, process toolbars across execution threads, read and write INI files, and manage selection and processing of DOS/Windows files.

The point is, the class library supports general purpose database Windows programs; it does not support, say, real-time process control for oil refineries.

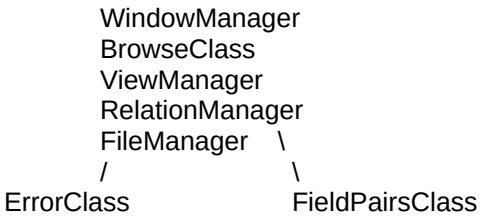
Core Classes

The Application Builder Classes may be logically divided into “core” classes and “peripheral” classes. The core classes are central to the ABC Library—everything else is built from them or hangs off them. If you intend to study the Application Builder Classes, you should begin with the core classes. Further, a thorough understanding of these classes should give you an excellent foundation for understanding the ABC Template generated programs and procedures that use these classes.

Even if you want to stay as far away from the ABC Library as possible, you should keep a couple of things in mind with regard to the core classes:

- The core classes are ErrorClass, FieldPairsClass, FileManager, RelationManager, ViewManager, WindowManager, and BrowseClass.
- Core classes are used repeatedly, so if you must modify them, try to keep them efficient.
- Core classes are almost certainly in any template based program, so additional references to them generally won’t affect the size of your executable.

There is a hierarchy within the core classes. The ErrorClass and the FieldPairsClass form the foundation upon which the FileManager, RelationManager, and ViewManager rest. Finally, the BrowseClass, which is derived from the ViewManager, tops off the core classes. The WindowManager is programmed to understand these core classes and manages window procedures that use them.



To understand these core classes, we recommend you tackle the core classes first (ErrorClass and FieldPairsClass), then work your way up to the WindowManager.

ABC Library Source Files

The Application Builder Classes are installed by default to the Clarion \LIBSRC folder. The specific classes reside in the following respective files. The core classes are shown in bold.

The class declarations reside in the .INC files, and their method definitions reside in the specified .CLW files.

ABASCII.INC	
AsciiFileClass	MODULE('ABASCII.CLW')
AsciiPrintClass	MODULE('ABASCII.CLW')
AsciiSearchClass	MODULE('ABASCII.CLW')
AsciiViewerClass	MODULE('ABASCII.CLW')
ABBROWSE.INC	
StepClass	MODULE('ABBROWSE.CLW')
StepLongClass	MODULE('ABBROWSE.CLW')
StepRealClass	MODULE('ABBROWSE.CLW')
StepStringClass	MODULE('ABBROWSE.CLW')
StepCustomClass	MODULE('ABBROWSE.CLW')
LocatorClass	MODULE('ABBROWSE.CLW')
StepLocatorClass	MODULE('ABBROWSE.CLW')
EntryLocatorClass	MODULE('ABBROWSE.CLW')
IncrementalLocatorClass	MODULE('ABBROWSE.CLW')
ContractingLocatorClass	MODULE('ABBROWSE.CLW')
EditClass	MODULE('ABBROWSE.CLW')
BrowseClass	**MODULE('ABBROWSE.CLW')**
ABDROPS.INC	
FileDropClass	MODULE('ABDROPS.CLW')
FileDropComboClass	MODULE('ABDROPS.CLW')

ABEIP.INC	
EditClass	MODULE('ABEIP.CLW')
EditCheckClass	MODULE('ABEIP.CLW')
EditColorClass	MODULE('ABEIP.CLW')
EditDropListClass	MODULE('ABEIP.CLW')
EditEntryClass	MODULE('ABEIP.CLW')
EditFileClass	MODULE('ABEIP.CLW')
EditFontClass	MODULE('ABEIP.CLW')
EditMultiSelectClass	MODULE('ABEIP.CLW')
ABERROR.INC	
ErrorClass	**MODULE('ABERROR.CLW')**
ABFILE.INC	
FileManager	**MODULE('ABFILE.CLW')**
RelationUsage	**MODULE('ABFILE.CLW')**
RelationManager	**MODULE('ABFILE.CLW')**
ViewManager	**MODULE('ABFILE.CLW')**
ABPOPUP.INC	
PopupClass	MODULE('ABPOPUP.CLW')
ABQUERY.INC	
QueryClass	MODULE('ABQUERY.CLW')
QueryVisualClass	MODULE('ABQUERY.CLW')
QueryFormVisual	MODULE('ABQUERY.CLW')
ABREPORT.INC	
ProcessClass	MODULE('ABREPORT.CLW')
PrintPreviewClass	MODULE('ABREPORT.CLW')
ReportManager	**MODULE('ABREPORT.CLW')**
ABRESIZE.INC	
WindowResizeClass	MODULE('ABRESIZE.CLW')
ABTOOLBA.INC	
ToolbarTargetClass	MODULE('ABTOOLBA.CLW')
ToolbarListboxClass	MODULE('ABTOOLBA.CLW')
ToolbarReltreeClass	MODULE('ABTOOLBA.CLW')
ToolbarUpdateClass	MODULE('ABTOOLBA.CLW')
ToolbarClass	MODULE('ABTOOLBA.CLW')
ABUTIL.INC	
ConstantClass	MODULE('ABUTIL.CLW')
FieldPairsClass	**MODULE('ABUTIL.CLW')**
BufferedPairsClass	**MODULE('ABUTIL.CLW')**
INIClass	MODULE('ABUTIL.CLW')
DOSFileLookupClass	MODULE('ABUTIL.CLW')
TranslatorClass	MODULE('ABUTIL.CLW')
ABWINDOW.INC	
WindowManager	**MODULE('ABWINDOW.CLW')**

Including the right files in your data section

Many of the class declarations directly reference other classes. To resolve these references, each class header (.INC file) INCLUDEs only the headers containing the directly referenced classes. This convention maximizes encapsulation, minimizes compile times, and ensures that all necessary components are present for the make process. We recommend you follow this convention too.

The Application Builder Classes source code is structured so that you can INCLUDE either the header or the definition (.CLW file) in your program's data section. If you include the header, it references the required definitions and vice versa.

A good rule of thumb is to INCLUDE as little as possible. The compiler will let you know if you have omitted something.

ABC Library and the ABC Templates

The ABC Templates rely heavily on the ABC Library. However, the templates are highly configurable and are designed to let you substitute your own class definitions if you wish. See *Part I—Classes Tab Options (Global)* for more information on configuring the global level interaction between the ABC Templates and the ABC Library. See *Part I—Classes Tab Options (Local)* for more information on configuring the local (module level) interaction between the ABC Templates and the ABC Library.

Classes and Their Template Generated Objects

The ABC Templates instantiate objects from the ABC Library. The default template generated *object* names are usually related to the corresponding *class* names, but they are not exactly the same. Your ABC applications' generated code may contain data declarations and executable statements similar to these:

```
GlobalErrors          ErrorClass
Hide:Access:Customer CLASS(FileManager)
INIMgr                INIClass
ThisWindow            CLASS(ReportManager)
ThisWindow            CLASS(WindowManager)
ThisReport            CLASS(ProcessClass)
ThisProcess           CLASS(ProcessClass)
BRW1                  CLASS(BrowseClass)
EditInPlace::CUS:NAME EditClass
Resizer               WindowResizeClass
Toolbar               ToolbarClass
 CODE
 GlobalResponse = ThisWindow.Run()
 BRW1.AddSortOrder(BRW1::Sort0:StepClass,ST:StKey)
 BRW1.AddToolbarTarget(Toolbar)
 GlobalErrors.Throw()
 Resizer.AutoTransparent=True
 Previewer.AllowUserZoom=True
```

These data declarations instantiate objects from the ABC Library, and the executable statements reference the instantiated objects. The various ABC classes and their template instantiations are listed below so you can identify ABC objects in your applications' generated code and find the corresponding ABC Library documentation.

Template Generated Object	Application Builder Class
Access:file	FileManager
BRWn	BrowseClass
BRWn::Sortn:Locator	LocatorClass
BRWn::Sortn:StepClass	StepClass
EditInPlace::field	EditClass
FDBn	FileDropClass
FDCBn	FileDropComboClass
FileLookupN	SelectFileClass
GlobalErrors	ErrorClass
INIMgr	INIClass
QBEn	QueryClass
QBVn	QueryVisualClass
Popup	PopupClass
Previewer	PrintPreviewClass
ProgressMgr	StepClass
Relate:file	RelationManager
RELn::Toolbar	ToolbarReltreeClass
Resizer	WindowResizeClass
ThisProcess	ProcessClass
ThisReport	ProcessClass
ThisWindow	WindowManager, ReportManager
Toolbar	ToolbarClass
ToolbarForm	ToolbarUpdateClass
Translator	TranslatorClass
ViewerN	ASCIIViewerClass

ABC Coding Conventions

The ABC Library uses several coding conventions. You may see instances of these code constructions in ABC applications' generated code and in the ABC Library code. We recommend that you follow these conventions within your embedded code.

Method Names

The following names have a specific meaning in the ABC Library. The names and their meanings are described below.

Add*Item*
The object adds an item to its datastore. The item may be a field, a key, a sort order, a range limit, another object, etc. The item may be anything the object needs to do its job.

Ask[*Information*]
The method interacts with the end user to get the Information.

Fetch
The method retrieves data from a file.

Get*Item*
The method returns the value of the named item.

Init
The method does whatever is required to initialize the object.

Kill
The method does whatever is required to shut down the object, including freeing any memory allocated during its lifetime.

Reset[*what* or *how*]
The method resets the object and its controls. This includes reloading data, resetting sort orders, redrawing window controls, etc.

Set*Item*
The method sets the value of the named item, or makes the named item active so that other object methods operate on the active item.

Take*Item*
The method "takes" the item from another method or object and continues processing it. The item may be a window event (Accepted, Rejected, OpenWindow, CloseWindow, Resize, etc.), a record, an error condition, etc.

Throw[*Item*]
The method “throws” the item to another object or method for handling. The item is usually an error condition.

Try*Action*
The method makes one attempt to carry out the action, then returns a value indicating success or failure. A return value of zero (0 or Level:Benign) indicates success; any other value indicates failure.

Where to Initilize & Kill Objects

There are generally two factors to consider when initializing and killing objects:

- Generally, objects should live as short a life a possible
- Objects should always be Killed (to free any memory allocated during its lifetime)

Balancing these two (sometimes conflicting) factors dictates that objects Initialized with EVENT:OpenWindow are usually Killed with EVENT:CloseWindow. Objects Initialized with ThisWindow.Init are usually Killed with ThisWindow.Kill.

Return Values

Many ABC methods return a value indicating success or failure. A return value of zero (0 or Level:Benign) indicates success. Any other return value indicates a problem whose severity may vary. Other return values and their ABC severity EQUATEs (Level:User, Level:Cancel, Level:Notify, Level:Fatal, Level:Program) are documented in the *Error Class* chapter and in the individual methods' documentation. This convention produces code like the following:

```
IF ABCObject.Method()
 !handle failure / error
ELSE

 !continue normally
END

IF ~ABCObject.Method()
 !continue normally
END
```

Event Processing Method Return Values

Some ABC methods process ACCEPT loop events. The names of these methods begin with "Take" and usually indicate the type of events they handle. These event processing methods execute within an ACCEPT loop (as implemented by the WindowManager.Ask method) and return a value indicating how the ACCEPT loop should proceed.

A return value of Level:Benign indicates processing of this event should continue normally. A return value of Level:Notify indicates processing is completed for this event and the ACCEPT loop should CYCLE. A return value of Level:Fatal indicates the event could not be processed and the ACCEPT loop should BREAK.

If you (or the ABC Templates) derive a class with any of these methods, you should use this return value convention to control ACCEPT loop processing.

Following is the WindowManager.Ask method code that implements this convention. See *WindowManager Concepts* for more information.

```
ACCEPT
 CASE SELF.TakeEvent()
 OF Level:Fatal
  BREAK
 OF Level:Notify
  CYCLE
 END
END
```

Ending a Procedure

In your embedded code you may encounter a condition that requires the procedure to end immediately (that is, it cannot wait for an EVENT:CloseWindow, or an EVENT:CloseWindow is not appropriate).

In some cases, a simple RETURN will not end your procedure (because a RETURN embedded within a derived method ends the method, not the calling procedure), and even if it would, it might not be appropriate (because the procedure may have allocated memory or started other tasks that should be ended in a controlled manner).

There are several ways you can initiate the normal shut down of your procedure, depending on where in the procedure your code is embedded. Following are the conventional ways to shut down your procedure normally.

```
RETURN(Level:Fatal)        !normal shutdown from ABC derived method

ReturnValue = Level:Fatal  !normal shutdown at end of ABC derived
method
ThisWindow.Kill            !normal shutdown from Procedure Routine
ThisWindow.Kill;RETURN     !normal shutdown from Procedure Routine
                           ! called from within ACCEPT loop
```

PRIVATE (undocumented) Items

Some of the properties and methods in the ABC Library have the PRIVATE attribute. These PRIVATE items are not documented. These items are PRIVATE because they are likely to change or disappear completely in future ABC Library releases. Making some items PRIVATE, gives TopSpeed the flexibility to change and improve these areas without affecting applications developed with the ABC Library. We strongly recommend that you do not remove the PRIVATE attributes on ABC Library items.

PROTECTED, VIRTUAL, DERIVED, and PROC Attributes

Some of the ABC Library properties and methods have special attributes that enhance their functionality, usability, and maintainability. Each property and method topic shows any applicable attributes in the syntax diagram (gray box). The purpose and effect of these attributes are documented here and in the Language Reference, but not in individual property and method topics.

PROTECTED Attribute

The **PROTECTED** attribute specifies that the property or method on which it is placed is visible only to the methods of the same CLASS or of derived CLASSes. This simply suggests that the property or method is important to the correct functioning of the CLASS, and that any changes to these items should be done with care. See *PROTECTED* in the *Language Reference*.

VIRTUAL Attribute

The **VIRTUAL** attribute allows methods in a parent CLASS to call methods in a derived CLASS. This has two primary benefits. First, it allows parent CLASSes to delegate the implementation of certain actions to derived classes; and second, it makes it easy for derived classes to override these same parent class actions. See *VIRTUAL* in the *Language Reference*.

Virtual methods let you insert custom code into an existing class, without copying or duplicating the existing code. Furthermore, the existing class calls the virtual methods (containing the custom code) as part of its normal operation, so you don't have to explicitly call them. When TopSpeed updates the existing class, the updates are automatically integrated into your application simply by recompiling. The existing class continues to call the virtual methods containing the custom code as part of its normal operation. This approach gives you many opportunities to customize your ABC applications while minimizing maintenance issues.

DERIVED Attribute

The **DERIVED** attribute is similar to the VIRTUAL attribute, except that it must have a matching prototype in the parent class.

PROC Attribute

The **PROC** attribute may be placed on a method prototyped with a return value, so you can call the method and ignore the return value without compiler warnings. See *PROC* in the *Language Reference*.

Documentation Conventions

Reference Item and Syntax Diagram

The documentation formats for Properties and Methods are illustrated in the following syntax diagrams.

Property (short description of intended use)

Property Datatype [, PROTECTED]

A complete description of the Property and its uses.

Datatype shows the datatype of the property such as LONG or &BrowseClass.

Implementation: A discussion of specific implementation issues. The implementation may change with each release / version of Internet Connect.

```
ComplexDataType STRUCTURE     !actual structure declaration

                END
```

See Also: Related Methods and Properties

Method (short description of what the method does)

Method(| parameter1 | [, parameter2]) [, PROTECTED] [, VIRTUAL] [, PROC]

| alternate |
| parameters |

Method A brief statement of what the method does.

parameter1 A complete description of parameter1, along with how it relates to parameter2 and the Method.

parameter2 A complete description of parameter2, along with how it relates to parameter1 and the Method. Brackets [ ] indicate optional parameters.

A concise description of what the Method does.

Implementation: A description of how the method currently accomplishes its objective. The implementation may change with each release / version of Clarion.

Return Data Type: The data type returned if applicable.

Example:

```
FieldOne = FieldTwo + FieldThree          !This is a source code example
FieldThree = Method(FieldOne,FieldTwo)    !Comments follow the "!" character
```

See Also: Related Methods and Properties

Conceptual Example

A description of the type of example to be illustrated. Examples show the concept of how a specific class is implemented in source code. The demands of brevity and concision often force the removal of structures which are not essential in illustrating the class.

```
 PROGRAM

 MAP
 END

! Data structures

 CODE
! Code Statements
```

ASCIIFileClass

ASCIIFileClass Overview

The ASCIIFileClass identifies, opens (read-only), indexes, and page-loads a file's contents into a QUEUE. The indexing function speeds any additional access of records and supports page-loading, which in turn allows browsing of very large files.

ASCIIFileClass Relationship to Other Application Builder Classes

There are several related classes whose collective purpose is to provide reusable, read-only, viewing, scrolling, searching, and printing capability for files, including variable length files. Although these classes are primarily designed for ASCII text and they anticipate using the Clarion ASCII Driver to access the files, they also work with binary files and with other database drivers. These classes can be used to build other components and functionality as well.

The classes that provide this read-only functionality and their respective roles are:

ASCIIViewerClass	ASCIIFileClass plus user interface
ASCIIFileClass	Open, read, filter, and index the file
ASCIIPrintClass	Print one or more lines
ASCIISearchClass	Locate and scroll to text

The ASCIIViewerClass is derived from the ASCIIFileClass. See *ASCIIViewerClass* for more information.

ASCIIFileClass ABC Template Implementation

The ASCIIFileClass serves as the foundation to the Viewer procedure template; however, the ABC Templates do not instantiate the ASCIIFileClass independently of the ASCIIViewerClass.

The ASCIIViewerClass is derived from the ASCIIFileClass, and the Viewer Procedure Template instantiates the derived ASCIIViewerClass.

ASCIIFileClass Source Files

The ASCIIFileClass source code is installed by default to the Clarion \LIBSRC folder. The ASCIIFileClass source code are contained in:

ABASCII.INC	ASCIIFileClass declarations
ABASCII.CLW	ASCIIFileClass method definitions

ASCIIFileClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an ASCIIFileClass object and related objects.

This example lets the end user select a file, then display it's pathname, total line count, and the text at a given percentage point within the file.

```
 PROGRAM
 MAP
 END
 INCLUDE('ABASCII.INC')                !declare ASCIIFileClass

Percentile   BYTE(50)                  !a value between 1 & 100
GlobalErrors ErrorClass                !declare GlobalErrors object
AFile        AsciiFileClass,THREAD     !declare AFile object
FileActive   BYTE(False),THREAD        !AFile initialized flag
Filename     STRING(255),THREAD        !FileName variable

AsciiFile FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1),THREAD
RECORD     RECORD,PRE()
Line        STRING(255)
           END
          END

window WINDOW('View a text file'),AT(3,7,203,63),SYSTEM,GRAY,DOUBLE
        PROMPT('Show Line at Percentile'),AT(5,4),USE(?Prompt:Pct)
        SPIN(@s3),AT(84,3,25,),USE(Percentile),RANGE(1,100)
        BUTTON('New File'),AT(113,2),USE(?NewFileButton)
        BUTTON('File Size'),AT(157,2),USE(?FileSizeButton)
        PROMPT('Line:'),AT(4,26),USE(?Prompt:Line)
        PROMPT(' '),AT(26,26,172,32),USE(?Line)
       END
 CODE
 GlobalErrors.Init                   !initialize GlobalErrors object
 OPEN(window)                        !Initialize AFile with:
 FileActive=AFile.Init( AsciiFile, | ! file label,
             A1:line,              | !file field to display
             Filename,             | !variable file NAME attribute
             GlobalErrors)           !GlobalErrors object
 IF FileActive
  window{PROP:Text}=AFile.GetFileName()
 ELSE
  window{PROP:Text}='no file selected'
 END

 ACCEPT
```

```
  CASE FIELD()
  OF ?NewFileButton                    !on New File button
   IF EVENT() = EVENT:Accepted
    CLEAR(FileName)
    FileActive=AFile.Reset(FileName)  !reset AFile to a new file
    IF FileActive
     window{PROP:Text}=AFile.GetFileName()    !show filename in titlebar
    ELSE
     window{PROP:Text}='no file selected'
    END
   END
  OF ?Percentile                   !on Percentile SPIN
   CASE EVENT()
   OF EVENT:Accepted OROF EVENT:NewSelection
    IF FileActive                  !calculate lineno and get the line
     ?Line{PROP:Text}=AFile.GetLine(Percentile/100*AFile.GetLastLineNo())
    ELSE
     ?Line{PROP:Text}='no file selected'
    END
   END
  OF ?FileSizeButton               !on File Size button
   IF EVENT() = EVENT:Accepted
    IF FileActive                  !display total line count
     ?FileSizeButton{PROP:Text}=AFile.GetLastLineNo()&' Lines'
    ELSE
     ?FileSizeButton{PROP:Text}='0 Lines'
    END
   END
  END
END
IF FileActive THEN AFile.Kill.     !shut down AFile object
GlobalErrors.Kill
```

AsciiFileClass Properties

ASCIIFile (the ASCII file)

ASCIIFile &FILE

The **File** property is a reference to the managed file. The File property simply identifies the managed file for the various ASCIIFileClass methods.

Implementation: The Init method initializes the File property.

See Also: Init

ErrorMgr (ErrorClass object)

ErrorMgr &ErrorClass, PROTECTED

The **ErrorMgr** property is a reference to the ErrorClass object for this ASCIIFileClass object. The ASCIIFileClass uses the ErrorMgr to handle various errors and conditions it encounters when processing the file.

Implementation: The Init method initializes the ErrorMgr property.

See Also: Init

OpenMode (file access/sharing mode)

OpenMode BYTE

The **OpenMode** property contains a value that determines the level of access granted to both the user opening the file and other users in a multi-user system.

Implementation: The Init method sets the OpenMode property to a hexadecimal value of 42h (ReadWrite/DenyNone). The ABC Templates override this default with the appropriate value from the application generator.

The Open method uses the OpenMode property when it OPENs the file for processing. See the *Language Reference* for more information on OPEN.

See Also: Init

AsciiFileClass Methods

ASCIIFileClass Functional Organization--Expected Use

As an aid to understanding the ASCIIFileClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ASCIIFileClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the ASCIIFileClass object
Kill	shut down the ASCIIFileClass object

Mainstream Use:

GetLastLineNo	return last line number
GetLine	return line of text
GetPercentile	convert file position to percentage
SetPercentile	convert percentage to file position

Occasional Use:

GetFilename	return the filename
Reset	reset the ASCIIFileClass object

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

GetDOSFilename	prompt end user to select a file
FormatLine	a virtual to format text
SetLine	position to specific line
ValidateLine	a virtual to implement a filter

FormatLine (a virtual to format text)

FormatLine(*line* [*, line number*] **), PROTECTED, VIRTUAL**

FormatLine	A virtual placeholder method to format text.
line	The label of the STRING variable containing the text to reformat.
line number	An integer constant, variable, EQUATE or expression that contains the offset or position of the line of text being formatted. If omitted, FormatLine operates on the current line.

The **FormatLine** method is a virtual placeholder method to reformat text prior to display at runtime.

Implementation: The FormatLine method is a placeholder for derived classes. It provides an easy way for you to reformat the text prior to display. The GetLine method calls the FormatLine method.

Example:

```
 INCLUDE('ABASCII.INC')                        !declare ASCIIViewerClass
MyViewer   CLASS(AsciiViewerClass),TYPE        !derive MyViewer class
FormatLine  PROCEDURE(*STRING),VIRTUAL         !prototype virtual FormatLine
           END
Viewer    MyViewer,THREAD                      !declare Viewer object
AsciiFile  FILE,DRIVER('ASCII'),NAME('MyText'),PRE(A1),THREAD
RECORD      RECORD,PRE()
Line         STRING(255)
            END
           END
 CODE
 !program code

MyViewer.FormatLine PROCEDURE(*STRING line) !called by ASCIIViewerClass
 CODE
 line = line[1:5]'  '&line[5:55]               !reformat the text
```

See Also: GetLine

GetDOSFilename (let end user select file)

GetDOSFilename(*filename* **), VIRTUAL**

GetDOSFilename Prompts the end user to select the file to process.

filename The label of the ASCIIFile property's NAME attribute variable which receives the selected filename.

The **GetDOSFilename** method prompts the end user to select the file to process and returns a value indicating whether the end user selected a file or did not select a file. A return value of one (1) indicates a file was selected and *filename* contains its pathname; a retun value of zero (0) indicates no file was selected and *filename* is empty.

Implementation: The GetDOSFileName method uses a SelectFileClass object to get the filename from the end user.

Return Data Type: BYTE

Example:

```
MyAsciiFileClass.Reset FUNCTION(*STRING FName)
RVal      BYTE(True)
SavePath  CSTRING(FILE:MaxFilePath+1),AUTO
  CODE
  CLOSE(SELF.AsciiFile)
  SavePath=PATH()
  LOOP
    IF ~FName AND ~SELF.GetDOSFilename(FName)
      RVal=False
      BREAK
    END
    OPEN(SELF.AsciiFile,ReadOnly+DenyNone)
    IF ERRORCODE()
      MESSAGE('Can't open ' & FName)
      RVal=False
    ELSE
      BREAK
    END
  END
  IF RVal
    SELF.FileSize=BYTES(SELF.AsciiFile)
  END
  SETPATH(SavePath)
  RETURN RVal
```

See Also: ASCIIFile, SelectFileClass

GetFilename (return the filename)

GetFilename

The **GetFilename** method returns the name of the ASCII file.

Implementation: The GetFileName method uses the NAME function. See the *Language Reference* for more information.

Return Data Type: STRING

Example:

```
 INCLUDE('ABASCII.INC')                  !declare ASCIIViewerClass
Viewer    AsciiViewerClass,THREAD           !declare Viewer object
Filename   STRING(255),THREAD             !declare filename variable
AsciiFile FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1),THREAD
RECORD     RECORD,PRE()
Line        STRING(255)
           END
          END
 CODE
 !program code
 MESSAGE('Filename:'&Viewer.GetFilename())         !get the ASCII filename
```

GetLastLineNo (return last line number)

GetLastLineNo, PROC

The **GetLastLineNo** method returns the number of the last line in the file, and indexes the entire file.

Return Data Type: LONG

Example:

```
MyViewer.TakeScroll PROCEDURE(UNSIGNED EventNo)
LineNo LONG
 CODE
 IF FIELD()=SELF.ListBox
  IF EVENT() = EVENT:ScrollBottom              !on scroll bottom
   LineNo = SELF.GetLastLineNo()              !index to end of file
   SELF.DisplayPage(LineNo-SELF.ListBoxItems+1)      !display last page
   SELECT(SELF.ListBox,SELF.ListBoxItems)         !highlight last row
  END
 END
```

GetLine (return line of text)

GetLine(*line number* **), PROC**

GetLine	Returns a line of text.
line number	An integer constant, variable, EQUATE or expresssion that contains the offset or position of the line of text to return.

The **GetLine** method returns the line of text specifiedby *line number*.

Implementation: The GetLine method gets a line at position *line number* from the ASCII file, extending the index queue if needed. If the index queue already contains the requested *line number* then the file is read using the existing offset, otherwise the index is extended. If the requested *line number* does not exist in the file, the text line is cleared and ERRORCODE() set.

Return Data Type: STRING

Example:

```
MyViewer.DisplayPage PROCEDURE(LONG LineNo)
LineOffset USHORT,AUTO
 CODE
 IF LineNo > 0                                    !line specified?
  SELF.ListBoxItems=SELF.ListBox{PROP:Items}      !note size of list box
  FREE(SELF.DisplayQueue)                         !free the display queue
  SELF.GetLine(LineNo+SELF.ListBoxItems-1)        !index to end of page
  LOOP LineOffset=0 TO SELF.ListBoxItems-1        !for each listbox line
   SELF.DisplayQueue.Line=SELF.GetLine(LineNo+LineOffset) !read ASCII file record
   IF ERRORCODE()                                 !on end of file
    BREAK                                         ! stop reading
   END
   ADD(SELF.DisplayQueue)                         !add to display queue
  END
  SELF.TopLine=LineNo                             !note 1st line displayed
  DISPLAY(SELF.ListBox)                           !redraw the list box
 END
```

See Also: GetLine

GetPercentile (convert file position to percentage:ASCIIFileClass)

GetPercentile(*line number* **)**

GetPercentile	Returns the specified position in the file as a percentage.
line number	An integer constant, variable, EQUATE or expresssion that contains the offset or position to convert to a percentage.

The **GetPercentile** method returns the specified position in the file as an approximate percentage which can be used to position a vertical scroll bar thumb.

Return Data Type: USHORT

Example:

```
SetThumb ROUTINE
 !current line is what % thru the file?
 PctPos=MyASCIIFile.GetPercentile(MyASCIIFile.TopLine+CHOICE(?ASCIIBox)-1)
 ?ASCIIBox{PROP:VScrollPos}=PctPos       !set thumb to corresponding % position
```

Init (initialize the ASCIIFileClass object)

Init(*file, field* [,*filename*]*, error handler* **)**

Init	Initializes the ASCIIFileClass object.
file	The label of the file to display.
field	The fully qualified label of the *file* field to display.
filename	The label of the *file*'s NAME attribute variable. If omitted, the *file* has a constant NAME attribute. If null (''), the ASCIIFileClass prompts the end user to select a file.
error handler	The label of the ErrorClass object to handle errors encountered by this ASCIIFileClass object.

The **Init** method initializes the ASCIIFileClass object and returns a value indicating whether it successfully accessed the *file* and is ready to proceed.

Implementation: The Init method returns one (1) if it accessed the *file* and is ready to proceed; it returns zero (0) and calls the Kill method if unable to access the *file* and cannot proceed. If the Init method returns zero (0), the ASCIIFileClass object is not initialized and you should not call its methods.

Return Data Type: BYTE

Example:

```
Filename    STRING(255),THREAD    !declare filename variable
FileActive  BYTE                  !declare success/fail switch
AsciiFile   FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1)
RECORD       RECORD,PRE()
Line          STRING(255)
             END
            END
 CODE                                        !init ASCIIFileClass object with:
 FileActive=ASCIIFile.Init(AsciiFile,    |   ! file label
              A1:Line,     |                 ! file field to display
              Filename,     |                ! NAME attribute variable
              GlobalErrors)                 ! ErrorClass object
 IF ~FileActive THEN RETURN.                !If init failed, don't proceed
 ACCEPT                                     !If init succeeded, proceed
  IF EVENT() = EVENT:CloseWindow
   IF FileActive THEN ASCIIFile.Kill.       !If init succeeded, shut down
  END !program code
END
```

See Also: Kill

Kill (shut down the ASCIIFileClass object)

Kill

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Example:

```
Filename   STRING(255),THREAD           !declare filename variable
FileActive  BYTE                        !declare success/fail switch
AsciiFile   FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1)
RECORD       RECORD,PRE()
Line          STRING(255)
             END
            END
 CODE                                   !init ASCIIFileClass object with:
 FileActive=ASCIIFile.Init(AsciiFile,|  ! file label
              A1:Line,               |  ! file field to display
              Filename,              |  ! NAME attribute variable
              GlobalErrors)             ! ErrorClass object
 IF ~FileActive THEN RETURN.            !If init failed, don't proceed
 ACCEPT                                 !If init succeeded, proceed
  IF EVENT() = EVENT:CloseWindow
   IF FileActive THEN ASCIIFile.Kill.   !If init succeeded, shut down
  END
  !program code
 END
```

Reset (reset the ASCIIFileClass object)

Reset(*filename* **)**

Reset Resets the ASCIIFileClass object.

filename The label of the ASCIIFile property's NAME attribute variable.

The **Reset** method resets the ASCIIFileClass object and returns a value indicating whether the end user selected a file or did not select a file. A return value of one (1) indicates a file was selected and *filename* contains its pathname; a retun value of zero (0) indicates no file was selected and *filename* is empty.

Implementation: The Reset method calls the GetDOSFileName method to get the filename from the end user. Reset opens the file and resets any statistics and flags associated with the selected file.

Return Data Type: BYTE

Example:

```
AsciiViewerClass.Reset FUNCTION(*STRING Filename)
  CODE
  FREE(SELF.DisplayQueue)
  DISPLAY(SELF.ListBox)
  IF ~PARENT.Reset(Filename) THEN RETURN False.
  SELF.TopLine=1
  SELF.DisplayPage
  SELECT(SELF.ListBox,1)
  RETURN True
```

See Also: ASCIIFile, GetDOSFilename

SetLine (a virtual to position the file)

SetLine(*line number* **), PROTECTED, VIRTUAL**

SetLine	A virtual placeholder method to position the file.
line number	The offset or position of the line in the file.

The **SetLine** method is a virtual placeholder method to position the file.

Implementation: The SetLine method is a placeholder for derived classes. The SetPercentile, the ASCIIViewerClass.AskGotoLine, and the ASCIISearchClass.Ask methods call the SetLine method.

Example:

```
MyViewerClass.SetLine PROCEDURE(LONG LineNo)  !synchronize LIST with line
number
 CODE
 SELF.DisplayPage(LineNo)                     !scroll list to LineNo
 !highlight the LineNo line
 SELECT(SELF.ListBox,CHOOSE(SELF.TopLine=LineNo,1,LineNo-SELF.TopLine+1))
```

See Also: SetPercentile, ASCIIViewerClass.AskGoToLine, ASCIISearchClass.Ask

SetPercentile (set file to relative position)

SetPercentile(*percentile* **)**

SetPercentile	Positions the file to the record nearest to file size * *percentile* / 100.
percentile	A value between 0 and 100 that indicates a relative position within the file. This value may be set by a vertical scrollbar thumb position.

The **SetPercentile** method positions the file to the record nearest to file size * *percentile* / 100. You may use SetPercentile to position the file based on the end user's vertical scrollbar thumb setting.

Implementation: The SetPercentile method positions the file based on a given percentage (usually determined by the vertical thumb position). SetPercentile extends the index as required and calls the virtual SetLine method to postion the file.

SetPercentile calculates the position by dividing *percentile* by 100 then multiplying the resulting percentage times the file size.

Example:

```
MyViewerClass.TakeDrag PROCEDURE(UNSIGNED EventNo)
 CODE
 IF FIELD()=SELF.ListBox
  IF EventNo = EVENT:ScrollDrag
   SELF.SetPercentile(SELF.ListBox{PROP:VScrollPos})  !reposition based on thumb
  END
 END
```

See Also: SetLine

ValidateLine (a virtual to implement a filter)

ValidateLine(*line* **), PROTECTED, VIRTUAL**

ValidateLine A virtual placeholder method to implement a filter.

line The offset or position of the line of text to evaluate.

The **ValidateLine** method is a virtual placeholder method to implement a filter. ValidateLine returns one (1) to include the *line* and zero (0) to exclude the *line*.

Implementation: The ValidateLine method is a placeholder method for derived classes. The ASCIIFileClass calls the ValidateLine method when it initially reads a record.

Return Data Type: BYTE

Example:

```
MyFileClass.ValidateLine FUNCTION(STRING LineToTest)

 CODE
 IF LineToTest[1] = '!'                !check for ! in column 1
  RETURN False                         !exclude lines with !
 ELSE
  RETURN True                          !include all other lines
 END
```

ASCIIPrintClass

ASCIIPrintClass Overview

The ASCIIPrintClass provides the user interface--a simple Print Options dialog--to print one or more lines from a text file. The ASCIIPrintClass interface lets the end user specify a range of lines to print, then optionally previews the lines before printing them. The ASCIIPrintClass interface also provides access to the standard Windows Print Setup dialog.

ASCIIPrintClass Relationship to Other Application Builder Classes

The ASCIIPrintClass relies on the ASCIIFileClass to read and index the file that it prints. It also relies on the PrintPreviewClass to provide the on-line preview. It also uses the TranslatorClass to translate its Print Options dialog text if needed.

The ASCIIViewerClass uses the ASCIIPrintClass to provide the end user with a Print Options dialog to print one or more lines from the viewed file.

There are several related classes whose collective purpose is to provide reusable, read-only, viewing, scrolling, searching, and printing capability for files, including variable length files. Although these classes are primarily designed for ASCII text and they anticipate using the Clarion ASCII Driver to access the files, they also work with binary files and with other database drivers. These classes can be used to build other components and functionality as well.

The classes that provide this read-only functionality are:

ASCIIViewerClass	ASCIIFileClass plus user interface
ASCIIFileClass	Open, read, filter, and index the file
ASCIIPrintClass	Print one or more lines
ASCIISearchClass	Locate and scroll to text

ASCIIPrintClass ABC Template Implementation

Both the Viewer procedure template and the ASCIIPrintButton control template generate code to instantiate an ASCIIPrintClass object. The Viewer template accomplishes this by adding a parameter to the ASCIIViewerClass.Init method. The ASCIIPrintButton template accomplishes this by declaring an ASCIIPrintClass object and calling the ASCIIViewerClass.AddItem method to register the ASCIIPrintClass object with the ASCIIViewerClass object.

ASCIIPrintClass Source Files

The ASCIIPrintClass source code is installed by default to the Clarion \LIBSRC folder. The specific ASCIIPrintClass source code and their respective components are contained in:

ABASCII.INC	ASCIIPrintClass declarations
ABASCII.CLW	ASCIIPrintClass method definitions

ASCIIPrintClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate an ASCIIPrintClass object and related objects.

This example lets the end user select a file, then search and print from it.

```
 MEMBER('viewer.clw')

 INCLUDE('ABASCII.INC')
 INCLUDE('ABWINDOW.INC')

 MAP
  MODULE('VIEWE002.CLW')
BrowseFiles  PROCEDURE
  END
 END

BrowseFiles  PROCEDURE

FilesOpened  BYTE
ViewerActive BYTE(False)
Filename     STRING(FILE:MaxFilePath),AUTO,STATIC,THREAD
AsciiFile FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1),THREAD
RECORD     RECORD,PRE()
Line        STRING(255)
           END
          END
ViewWindow  WINDOW('View an ASCII File'),AT(3,7,296,136),SYSTEM,GRAY
             LIST,AT(5,5,285,110),USE(?AsciiBox),IMM,FROM('')
             BUTTON('&Print...'),AT(7,119),USE(?Print)
             BUTTON('&Search...'),AT(44,119),USE(?Search)
            END
ThisWindow  CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeAccepted PROCEDURE(),BYTE,PROC,VIRTUAL
            END

Viewer    AsciiViewerClass            !declare Viewer object
```

```
Searcher  AsciiSearchClass            !declare Searcher object
Printer   AsciiPrintClass             !declare Printer object

 CODE
 GlobalResponse = ThisWindow.Run()

ThisWindow.Init PROCEDURE()
ReturnValue   BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?AsciiBox
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 OPEN(ViewWindow)
 SELF.Opened=True
 CLEAR(Filename)
 ViewerActive=Viewer.Init(AsciiFile,A1:Line,Filename,?AsciiBox,GlobalErrors)
 IF ~ViewerActive THEN RETURN Level:Fatal.
 Viewer.AddItem(Searcher)               !register Searcher with Viewer
 Viewer.AddItem(Printer)                !register Printer with Viewer
 SELF.SetAlerts()
 RETURN ReturnValue

ThisWindow.TakeAccepted PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
  ReturnValue = PARENT.TakeAccepted()
    CASE ACCEPTED()
    OF ?Print
      ThisWindow.Update
      IF ViewerActive THEN Viewer.Printer.Ask.   !display Print Options dialog
    OF ?Search
      ThisWindow.Update
      IF ViewerActive
       IF CHOICE(?AsciiBox)>0                    !search from current line
        Viewer.Searcher.Ask(Viewer.TopLine+CHOICE(?AsciiBox)-1)
       ELSE
        Viewer.Searcher.Ask(1)                   !search from line 1
       END
      END
    END
    RETURN ReturnValue
```

AsciiPrintClass Properties

FileMgr (AsciiFileClass object:AsciiPrintClass)

FileMgr &AsciiFileClass, PROTECTED

The **FileMgr** property is a reference to the AsciiFileClass object that manages the file to print. The AsciiPrintClass object uses the FileMgr to read the file, manage print range line numbers and to handle error conditions and messages.

Implementation: The Init method initializes the FileMgr property.

See Also: Init

PrintPreview (print preview switch)

PrintPreview BYTE

The **PrintPreview** property contains the print preview setting for the AsciiPrintClass object. A value of one (1 or True) initially "checks" the print preview box (default is preview); a value of zero (0 or False) "clears" the print preview box (default is no preview).

Implementation: The Init method sets the PrintPreview property to false. The PrintLines method implements the action specified by the PrintPreview property.

See Also: Init, PrintLines

Translator (TranslatorClass object:AsciiPrintClass)

Translator &TranslatorClass, PROTECTED

The **Translator** property is a reference to the TranslatorClass object for the AsciiPrintClass object. The AsciiPrintClass object uses this property to translate text in the object's Print Options dialog to the appropriate language.

Implementation: The AsciiPrintClass does not initialize the Translator property. The AsciiPrintClass only invokes the Translator if the Translator property is not null. You can use the AsciiViewerClass.SetTranslator method or a reference assignment statement to set the Translator property.

See Also: AsciiViewerClass.SetTranslator

AsciiPrintClass Methods

Ask (solicit print specifications)

Ask, VIRTUAL

The **Ask** method displays a Print Options dialog that prompts the end user for print specifications, then prints the selected lines subject to those specifications (printer destination, paper orientation, etc.).

Implementation: The Ask method prompts the end user for print specifications (including the Windows standard Print Setup dialog), print preview, plus a range of lines to print. If the user CLICKS the Print button, the Ask method prints the requested lines to the printer specified by the end user.

Example:

```
ACCEPT
 CASE FIELD()
 OF ?PrintButton                          !on "Print" button
  IF EVENT() = EVENT:Accepted             !call the Printer.Ask method
   IF ViewerActive THEN Viewer.Printer.Ask. !to gather specs and print lines
  END
 END
END
```

Init (initialize the ASCIIPrintClass object)

Init(*ASCIIFileMgr* **), VIRTUAL**

Init	Initializes the ASCIIPrintClass object.
ASCIIFileMgr	The label of the ASCIIFileClass object that manages the file to print. The ASCIIPrintClass object uses the *ASCIIFileMgr* to read from the file and handle line numbers and error conditions.

The **Init** method initializes the ASCIIPrintClass object.

Example:

```
MyViewerClass.Init FUNCTION(FILE AsciiFile,*STRING FileLine,*STRING Filename,|
             UNSIGNED ListBox,ErrorClass ErrHandler,BYTE Enables)
 CODE
 !program code
 IF BAND(Enables,EnableSearch)          !if Search flag is on
  SELF.Searcher &= NEW AsciiSearchClass !instantiate Searcher object
  SELF.Searcher.Init(SELF)              !initialize Searcher object
 END
 IF BAND(Enables,EnablePrint)           !if Print flag is on
  SELF.Printer &= NEW AsciiPrintClass   !instantiate Printer object
  SELF.Printer.Init(SELF)               !initialize Printer object
 END
```

PrintLines (print or preview specified lines)

PrintLines(*first, last* **), VIRTUAL**

PrintLines	Prints or previews the specified lines.
first	An integer constant, variable, EQUATE, or expression containing the number of the first line of the range of lines to print.
last	An integer constant, variable, EQUATE, or expression containing the number of the last line of the range of lines to print.

If the PrintPreview property is True, the **PrintLines** method previews the specified lines, then prints the lines or not, depending on the end user's response to the preview.

If the PrintPreview property is False, the **PrintLines** method prints the specified lines to the selected printer.

Example:

```
IF EVENT() = EVENT:Accepted
 IF ACCEPTED() = ?PrintButton
  FirstLine=1
  LastLine=HighestLine
  SELF.PrintLines(FirstLine,LastLine)
  POST(EVENT:CloseWindow)
 END
END
```

See Also: PrintPreview

ASCIISearchClass

ASCIISearchClass Overview

The ASCIISearchClass provides the user interface--a persistent non-MDI Find dialog--to locate specific text within the browsed file. The ASCIISearchClass interface lets the end user specify the direction and case sensitivity of the search, and it allows repeating searches ("find next").

ASCIISearchClass Relationship to Other Application Builder Classes

The ASCIISearchClass relies on the ASCIIFileClass to read and index the file that it searches. It also uses the TranslatorClass to translate its Find dialog text if needed.

The ASCIIViewerClass uses the ASCIISearchClass to provide the end user with a Find dialog to locate text in the viewed file.

There are several related classes whose collective purpose is to provide reusable, read-only, viewing, scrolling, searching, and printing capability for files, including variable length files. Although these classes are primarily designed for ASCII text and they anticipate using the Clarion ASCII Driver to access the files, they also work with binary files and with other database drivers. These classes can be used to build other components and functionality as well.

The classes that provide this read-only functionality and their respective roles are:

ASCIIViewerClass	ASCIIFileClass plus user interface
ASCIIFileClass	Open, read, filter, and index the file
ASCIISearchClass	Print one or more lines
ASCIISearchClass	Locate and scroll to text

ASCIISearchClass ABC Template Implementation

Both the Viewer procedure template and the ASCIISearchButton control template generate code to instantiate an ASCIISearchClass object. The Viewer template accomplishes this by adding a parameter to the ASCIIViewerClass.Init method. The ASCIISearchButton template accomplishes this by declaring an ASCIISearchClass object and calling the ASCIIViewerClass.AddItem method to register the ASCIISearchClass object with the ASCIIViewerClass object.

ASCIISearchClass Source Files

The ASCIISearchClass source code is installed by default to the Clarion \LIBSRC folder. The specific ASCIISearchClass source code and their respective components are contained in:

ABASCII.INC	ASCIISearchClass declarations
ABASCII.CLW	ASCIISearchClass method definitions

ASCIISearchClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate an ASCIISearchClass object and related objects.

This example lets the end user select a file, then search and print from it.

```
 MEMBER('viewer.clw')

 INCLUDE('ABASCII.INC')
 INCLUDE('ABWINDOW.INC')

 MAP
  MODULE('VIEWE002.CLW')
BrowseFiles  PROCEDURE
  END
 END

BrowseFiles  PROCEDURE

FilesOpened  BYTE
ViewerActive BYTE(False)
Filename     STRING(FILE:MaxFilePath),AUTO,STATIC,THREAD
AsciiFile    FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1),THREAD
RECORD        RECORD,PRE()
Line           STRING(255)
              END
             END

ViewWindow  WINDOW('View an ASCII File'),AT(3,7,296,136),SYSTEM,GRAY
             LIST,AT(5,5,285,110),USE(?AsciiBox),IMM,FROM('')
             BUTTON('&Print...'),AT(7,119),USE(?Print)
             BUTTON('&Search...'),AT(44,119),USE(?Search)
            END
ThisWindow  CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeAccepted PROCEDURE(),BYTE,PROC,VIRTUAL
            END

Viewer    AsciiViewerClass           !declare Viewer object
Searcher  AsciiSearchClass           !declare Searcher object
Printer   AsciiPrintClass            !declare Printer object

 CODE
 GlobalResponse = ThisWindow.Run()

ThisWindow.Init PROCEDURE()
ReturnValue   BYTE,AUTO
```

```
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?AsciiBox
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 OPEN(ViewWindow)
 SELF.Opened=True
 CLEAR(Filename)
 ViewerActive=Viewer.Init(AsciiFile,A1:Line,Filename,?AsciiBox,GlobalErrors)
 IF ~ViewerActive THEN RETURN Level:Fatal.
 Viewer.AddItem(Searcher)               !register Searcher with Viewer
 Viewer.AddItem(Printer)                !register Printer with Viewer
 SELF.SetAlerts()
 RETURN ReturnValue

ThisWindow.TakeAccepted PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
  ReturnValue = PARENT.TakeAccepted()
    CASE ACCEPTED()
    OF ?Print
      ThisWindow.Update
      IF ViewerActive THEN Viewer.Printer.Ask.    !display Print Options dialog
    OF ?Search
      ThisWindow.Update
      IF ViewerActive
        IF CHOICE(?AsciiBox)>0                    !search from current line
     Viewer.Searcher.Ask(Viewer.TopLine+CHOICE(?AsciiBox)-1)
    ELSE
     Viewer.Searcher.Ask(1)                       !search from line 1
    END
   END
    END
    RETURN ReturnValue
```

AsciiSearchClass Properties

Find (search constraints)

Find FindGroup, PROTECTED

The **Find** property contains the current search criteria or specification.

Implementation: The search specification includes the text to search for, the direction in which to search, and whether or not the search is case sensitive.

The Ask method sets the values of the Find property based on end user input to the Find dialog. The Setup method sets the values of the Find property for use without the Ask method. The Next method implements the seach specified by the Find property.

The FindGroup data type is declared in ABASCII.INC as follows:

```
FindGroup  GROUP,TYPE
What        PSTRING(64)  !text to look for
MatchCase   BYTE         !case sensitive?
Direction   STRING(4)    !either 'Up  ' or 'Down'
           END
```

See Also: Ask, Next, Setup

FileMgr (AsciiFileClass object:AsciiSearchClass)

FileMgr &AsciiFileClass, PROTECTED

The **FileMgr** property is a reference to the AsciiFileClass object tyhat manages the file to search. The AsciiSearchClass object uses the FileMgr to read the file, and to handle error conditions and messages.

Implementation: The Init method initializes the FileMgr property.

See Also: Init

LineCounter (current line number)

LineCounter LONG, PROTECTED

The **LineCounter** property contains the current line number of the searched file.

Implementation: The ASCIISearchClass object uses the LineCounter property to implement "find next" searches--searches that continue from the current line.

Translator (TranslatorClass object:ASCIISearchClass)

Translator &TranslatorClass, PROTECTED

The **Translator** property is a reference to the TranslatorClass object for the ASCIISearchClass object. The ASCIISearchClass object uses this property to translate window text to the appropriate language.

Implementation: The ASCIISearchClass does not initialize the Translator property. The ASCIISearchClass only invokes the Translator if the Translator property is not null. You can use the AsciiViewerClass.SetTranslator method to set the Translator property.

See Also: AsciiViewerClass.SetTranslator

AsciiSearchClass Methods

Ask (solicit search specifications)

Ask([*startline*] **), VIRTUAL**

Ask	Prompts the end user for search specifications then positions to the specified search value.
startline	The offset or position of the line at which to begin the search, typically the current line position. If omitted, *startline* defaults to one (1).

The **Ask** method prompts the end user for search specifications then positions the file to the next line subject to the search specifications, or issues an appropriate message if the search value is not found.

Implementation: The Ask method prompts the end user for search specifications including a value to search for, the direction of the search, and whether the search is case sensitive. If the user invokes the search (doesn't cancel), the Ask method positions the file to the next line containing the search value, or issues an appropriate message if the search value is not found.

Example:

```
ACCEPT
 CASE FIELD()
 OF ?PrintButton
  IF EVENT() = EVENT:Accepted
   IF ViewerActive THEN Viewer.Printer.Ask.
  END
 OF ?Search                          !on "search" button
  IF EVENT() = EVENT:Accepted
   IF ViewerActive                          !call Searcher.Ask method
    StartSearch=CHOOSE(CHOICE(?AsciiBox)>0, |  ! passing the currently
    Viewer.TopLine+CHOICE(?AsciiBox)-1,1)      ! selected line as the
    Viewer.Searcher.Ask(StartSearch)           ! search's starting point
   END
  END
 END
END
```

Init (initialize the ASCIISearchClass object)

Init(*ASCIIFileMgr* **), VIRTUAL**

Init	Initializes the ASCIISearchClass object.
ASCIIFileMgr	The label of the ASCIIFileClass object that manages the file to search. The ASCIISearchClass object uses the *ASCIIFileMgr* to read from the file.

The **Init** method initializes the ASCIISearchClass object.

Example:

```
MyViewerClass.Init FUNCTION(FILE AsciiFile,*STRING FileLine,*STRING Filename,|
             UNSIGNED ListBox,ErrorClass ErrHandler,BYTE Enables)
 CODE
 !program code
 IF BAND(Enables,EnableSearch)          !if Search flag is on
  SELF.Searcher &= NEW AsciiSearchClass !instantiate Searcher object
  SELF.Searcher.Init(SELF)              !initialize Searcher object
 END
 IF BAND(Enables,EnablePrint)           !if Print flag is on
  SELF.Printer &= NEW AsciiPrintClass   !instantiate Printer object
  SELF.Printer.Init(SELF)               !initialize Printer object
 END
```

Next (find next line containing search text)

Next, VIRTUAL

The **Next** method returns the line number of the next line containing the search value specified by the Ask method.

Implementation: The Ask method calls the Next method. The Next method searches for the search value and in the direction set by the Ask method. Alternatively, you can use the Setup method to set the search constraints.

Return Data Type: LONG

Example:

```
MyAsciiSearchClass.Ask PROCEDURE
 CODE
 !procedure code
 CASE EVENT()
 OF EVENT:Accepted
  CASE FIELD()
  OF ?NextButton
   SELF.LineCounter=SELF.Next()
   IF SELF.LineCounter
    SELF.FileMgr.SetLine(SELF.LineCounter)
   END
 !procedure code
```

See Also: Ask, Setup

Setup (set search constraints)

Setup(*constraints* [, *startline*] **)**

Setup	Sets the search constraints.
constraints	The label of a structure containing the search constraints. The structure must have the same structure as the FindGroup GROUP declared in ABASCII.INC.
startline	The offset or position of the line at which to begin the search, typically the current line position. If omitted, *startline* defaults to one (1).

The **Setup** method sets the search constraints. The AsciiSearchClass object applies the constraints when searching the text file.

Implementation: The ABC Library does not call the Setup method. The Setup method is provided so you can do custom searches outside the normal AsciiViewerClass process (without using the Ask method).

The Next method applies the search constraints set by the Setup method. The constraints include the text to search for, the direction in which to search, and whether or not the search is case sensitive.

The FindGroup GROUP is declared in ABASCII.INC as follows:

```
FindGroup  GROUP,TYPE
What        PSTRING(64) !text to look for
MatchCase   BYTE        !case sensitive?
Direction   STRING(4)   !either 'Up  ' or 'Down'
           END
```

Example:

```
MyAsciiSearchClass.Ask PROCEDURE
Constraints  LIKE(FindGroup)
 CODE
 Constraints.MatchCase = False        !never case sensitive
 Constraints.Direction = 'Down'       !always search downward
 !prompt end user for search value
 SELF.Setup(Constraints,StartLine)    !set search constraints
 SELF.LineCounter=SELF.Next()         !execute search
 IF SELF.LineCounter
  SELF.FileMgr.SetLine(SELF.LineCounter) !set to next line containing search value
 ELSE
  MESSAGE(''''&CLIP(SELF.Constraints.What)&''' not found.')
 END
```

See Also: Ask, Next

ASCIIViewerClass

ASCIIViewerClass Overview

There are several related classes whose collective purpose is to provide reusable, read-only, viewing, scrolling, searching, and printing capability for files, including variable length files. Although these classes are primarily designed for ASCII text and they anticipate using the Clarion ASCII Driver to access the files, they also work with binary files and with other database drivers. These classes can be used to build other components and functionality as well.

The classes that provide this read-only functionality are the ASCII Viewer classes. The ASCII Viewer classes and their respective roles are:

ASCIIViewerClass	Supervisor class
ASCIIFileClass	Open, read, filter, and index the file
ASCIIPrintClass	Print one or more lines
ASCIISearchClass	Locate and scroll to text

These classes are fully documented in the remainder of this chapter.

ASCIIViewerClass

The ASCIIViewerClass uses the ASCIIFileClass, the ASCIIPrintClass, and the ASCIISearchClass to create a single full featured ASCII file viewer object. This object uses a LIST control to display, scroll, search, and print the contents of the file. Typically, you instantiate only the ASCIIViewerClass in your program which, in turn, instantiates the other classes as needed.

ASCIIFileClass

The ASCIIFileClass identifies, opens (read-only), indexes, and page-loads a file's contents into a QUEUE. The indexing function speeds any reaccess of records and supports page-loading, which in turn allows browsing of very large files.

ASCIIPrintClass

The ASCIIPrintClass lets the end user specify a range of lines to print, then prints them. It also provides access to the standard Windows Print Setup dialog.

ASCIISearchClass

The ASCIISearchClass lets the end user specify a search value, case sensitivity, and a search direction, then scrolls to the next instance of the search value within the file.

ASCIIViewerClass Relationship to Other Application Builder Classes

The ASCIIViewerClass is derived from the ASCIIFileClass, plus it relies on the ASCIIPrintClass, ASCIISearchClass, ErrorClass, and PopupClass to accomplish some user interface tasks. Therefore, if your program instantiates the ASCIIViewerClass, it must also instantiate these other classes. Much of this is automatic when you INCLUDE the ASCIIViewerClass header (ABASCII.INC) in your program's data section. See the *Conceptual Example*.

ASCIIViewerClass ABC Template Implementation

The ABC Templates declare a local ASCIIViewer class *and* object for each instance of the ASCIIViewControl template. The ABC Templates automatically include all the classes necessary to support the functionality specified in the ASCIIViewControl template.

The templates *derive* a class from the ASCIIViewerClass for *each* ASCIIViewerClass in the application. The derived class is called *procedure*:Viewer# where *procedure* is the procedure name and # is the instance number of the ASCIIViewControl template. The templates provide the derived class so you can use the ASCIIViewControl template **Classes** tab to easily modify the viewer's behavior on an instance-by-instance basis.

The object is named Viewer# where # is the instance number of the control template. The derived ASCIIViewerClass is local to the procedure, is specific to a single ASCIIViewerClass and relies on the global ErrorClass object.

ASCIIViewerClass Source Files

The ASCIIViewerClass source code is installed by default to the Clarion \LIBSRC folder. The specific ASCIIViewerClass source code and their respective components are contained in:

ABASCII.INC	ASCIIViewerClass declarations
ABASCII.CLW	ASCIIViewerClass method definitions

ASCIIViewerClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate an ASCIIViewerClass object and related objects.

This example lets the end user select a file, then browse, scroll, search, and print from it.

```
 PROGRAM
 MAP
 END

 INCLUDE('ABASCII.INC')                !declare ASCIIViewer Class

ViewWindow WINDOW('View a text file'),AT(3,7,296,136),SYSTEM,GRAY
            LIST,AT(5,5,285,110),USE(?AsciiBox),IMM
            BUTTON('&Print'),AT(5,120),USE(?Print)
            BUTTON('&Search'),AT(45,120),USE(?Search)
            BUTTON('&Close'),AT(255,120),USE(?Close)
           END
GlobalErrors ErrorClass               !declare GlobalErrors object
Viewer       AsciiViewerClass,THREAD  !declare Viewer object

ViewerActive BYTE(False),THREAD       !Viewer initialized flag
Filename     STRING(255),THREAD       !FileName variable
StartSearch  LONG                     !hold selected line number

AsciiFile FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1),THREAD
RECORD     RECORD,PRE()
Line        STRING(255)
           END
          END
 CODE

 GlobalErrors.Init                    !initialize GlobalErrors object
 OPEN(ViewWindow)                     !open the window
                                      !Initialize Viewer with:
 ViewerActive=Viewer.Init( AsciiFile,   |       ! file label,
             A1:line,                   |       ! file field to display
             Filename,                  |       ! variable file NAME attribute
             ?AsciiBox,                 |       ! LIST control number
             GlobalErrors,              |       ! ErrorClass object
             EnableSearch+EnablePrint)          ! features to implement flag
 IF ~ViewerActive THEN RETURN.                  !if init unsuccessful, don't
                                                ! call other Viewer methods
```

AsciiViewerClass Properties

Popup (PopupClass object)

Popup &PopupClass

The **Popup** property is a reference to the PopupClass object for this ASCIIViewerClass object. The ASCIIViewerClass object uses the Popup property to define and manage its popup menus.

Implementation: The Init method initializes the Popup property.

See Also: Init

Printer (ASCIIPrintClass object)

Printer &ASCIIPrintClass

The **Printer** property is a reference to the ASCIIPrintClass object for this ASCIIViewerClass object. The ASCIIViewerClass object uses the Printer property to solicit print ranges and specifications from the end user, then print from the file subject to the specifications.

Implementation: The AddItem and Init methods initialize the Printer property.

The **Printer** property is added to the AsciiViewer by calling the AddItem method. The AsciiViewer does not take ownership of these objects, it just uses them if supplied. It is up to the owner of the objects to destroy them when they are no longer required.

Since these objects are generated by the templates in local procedure scope, they will be destroyed when the enclosing generated procedure dies. If these objects are created by hand coding, then they should be destroyed by whoever creates them.

The exception to this is when the **EnablePrint** parameter is set on the **Init** call. In this case the AsciiViewer may create it's own "internal" printer and viewer. In this case, they are destroyed in the **Kill** method of the AsciiViewer.

See Also: AddItem, Init

Searcher (ASCIISearchClass object)

Searcher **&ASCIISearchClass**

The **Searcher** property is a reference to the ASCIISearchClass object for this ASCIIViewerClass object. The ASCIIViewerClass object uses the Searcher property to solicit search values from the end user, then locate the values within the browsed file.

Implementation: The AddItem and Init methods initialize the Searcher property.

The **Searcher** property is added to the AsciiViewer by calling the AddItem method. The AsciiViewer does not take ownership of these objects, it just uses them if supplied. It is up to the owner of the objects to destroy them when they are no longer required.

Since these objects are generated by the templates in local procedure scope, they will be destroyed when the enclosing generated procedure dies. If these objects are created by hand coding, then they should be destroyed by whoever creates them.

The exception to this is when the **EnableSearch** parameter is set on the **Init** call. In this case the AsciiViewer may create it's own "internal" viewer. In this case, they are destroyed in the **Kill** method of the AsciiViewer.

See Also: AddItem, Init

TopLine (first line currently displayed)

TopLine **UNSIGNED**

The **TopLine** property contains the offset or position of the first line currently displayed by the ASCIIViewerClass object. The ASCIIViewerClass object uses the TopLine property to manage scrolling and scrollbar thumb positioning.

AsciiViewerClass Methods

AsciiViewerClass Functional Organization--Expected Use

As an aid to understanding the ASCIIViewerClass, it is useful to organize the its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ASCIIViewerClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the ASCIIViewerClass object
Kill	shut down the ASCIIViewerClass object

Mainstream Use:

AskGotoLine	go to user specified line
DisplayPage	display new page
PageDown	scroll down one page
PageUp	scroll up one page
TakeEvent	process ACCEPT loop event

Occasional Use:

AddItem	add printer or searcher object
GetFilename[I]	return the filename
GetLastLineNo[I]	return last line number
GetLine[I]	return line of text
GetPercentile[I]	convert file position to percentage
Reset	reset the ASCIIViewerClass object
SetPercentile[I]	convert percentage to file position
SetLine[V]	position to specific line
SetLineRelative	move N lines

[I] These methods are inherited from the ASCIIFileClass.

[V] These methods are also virtual.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

FormatLine[I]	format text
SetLine	position to specific line
ValidateLine[I]	implement a filter

[I] These methods are inherited from the ASCIIFileClass.

AddItem (program the AsciiViewer object)

AddItem(| *printer* | **)**

| *searcher* |

AddItem	Adds specific functionality to the AsciiViewer object.
printer	The label of an AsciiPrintClass object.
searcher	The label of an AsciiSearchClass object.

The **AddItem** method adds specific functionality to the AsciiViewer object. This method provides an alternative to the Init method for adding or changing the print and search capability of the AsciiViewer object.

Implementation: The AddItem method sets the value of the Printer or Searcher property, initializes the *printer* or *searcher*, then enables the corresponding popup menu item.

Example:

```
MyPrinter  CLASS(AsciiPrintClass)         !declare custom printer object
NewMethod   PROCEDURE
           END
MySearcher CLASS(AsciiSearchClass)        !declare custom searcher object
NewMethod   PROCEDURE
           END

 CODE
 Viewer.Init(AsciiFile,A1:line,Filename,?AsciiBox,GlobalErrors)
 Viewer.AddItem(MyPrinter)             !add print functionality
 Viewer.AddItem(MySearcher)            !add search functionality
```

See Also: Init, Printer, Searcher

AskGotoLine (go to user specified line)

AskGotoLine

The **AskGotoLine** method prompts the end user for a specific line number to display, then positions the file to the line nearest the one specified.

Implementation: The ASCIIViewerClass invokes the AskGotoLine method from a RIGHT-CLICK popup menu. The AskGotoLine method calls the SetLine method to position to the requested record.

Example:

```
MyViewerClass.TakeEvent PROCEDURE(UNSIGNED EventNo)
  CODE
  CASE EventNo
  OF EVENT:AlertKey
    IF KEYCODE()=MouseRight
      CASE SELF.Popup.Ask()
      OF 'Print'
        SELF.Printer.Ask
      OF 'Goto'
        SELF.AskGotoLine
      END
    END
  END
```

See Also: SetLine

DisplayPage (display new page)

DisplayPage([*line number*] **)**

DisplayPage	Displays a new page from the file.
line number	An integer constant, variable, EQUATE or expresssion that contains the offset or position of the line of text to include in the display. If omitted, *line number* defaults to the value of the TopLine property.

The **DisplayPage** method displays a new page from the file. The display includes the line at *line number*, or the line specified by the TopLine property, if *line number* is omitted.

Example:

```
MyViewerClass.Reset PROCEDURE(*STRING Filename)
  CODE
  FREE(SELF.DisplayQueue)
  DISPLAY(SELF.ListBox)
  PARENT.Reset(Filename)
  SELF.TopLine=1
  SELF.DisplayPage
  SELECT(SELF.ListBox,1)
```

See Also: TopLine

Init (initialize the ASCIIViewerClass object)

Init(*file, field,* [*filename*]*, list control, error handler* [*, features*] **)**

Init	Initializes the ASCIIViewerClass object.
file	The label of the file to display.
field	The fully qualified label of the *file* field to display.
filename	The label of the *file*'s NAME attribute variable. If omitted, the file has a constant NAME attribute. If null (''), the Init method prompts the end user to select a file.
list control	An integer constant, variable, EQUATE, or expression containing the control number of the LIST that displays the *file* contents.
error handler	The label of the ErrorClass object to handle errors encountered by this ASCIIViewerClass object.
features	An integer constant, variable, EQUATE, or expression that tells the ASCIIViewerClass object which features to implement; for example, printing (*EnablePrint*), searching (*EnableSearch*), or both. If omitted, no additional features are implemented.

The **Init** method initializes the ASCIIViewerClass object and returns a value indicating whether it successfully accessed the *file* and is ready to proceed.

Implementation: The Init method returns one (1) if it accessed the *file* and is ready to proceed; it returns zero (0) and calls the Kill method if unable to access the *file* and cannot proceed. If the Init method returns zero (0), the ASCIIViewerClass object is not initialized and you should not call its methods.

You can set the *features* value with the following EQUATEs declared in ASCII.INC. Pass either EQUATE to implement its feature (search or print), or add the EQUATEs together to implement both features.

```
EnableSearch        BYTE(001b)
EnablePrint         BYTE(010b)
```

Return Data Type: BYTE

Example:

```
 PROGRAM
 MAP
 END

 INCLUDE('ABASCII.INC')                !declare ASCIIViewer Class

ViewWindow WINDOW('View an ASCII File'),AT(3,7,296,136),SYSTEM,GRAY
            LIST,AT(5,5,285,110),USE(?AsciiBox),IMM
            BUTTON('&Print'),AT(5,120),USE(?Print)
            BUTTON('&Search'),AT(45,120),USE(?Search)
            BUTTON('&Close'),AT(255,120),USE(?Close)
           END

GlobalErrors ErrorClass                !declare GlobalErrors object
Viewer    AsciiViewerClass,THREAD         !declare Viewer object

ViewerActive BYTE(False),THREAD           !Viewer initialized flag
Filename     STRING(255),THREAD           !FileName variable

AsciiFile FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1),THREAD
RECORD     RECORD,PRE()
Line        STRING(255)
           END
          END
 CODE

 GlobalErrors.Init                          !initialize GlobalErrors object
 OPEN(ViewWindow)                           !open the window
 !Initialize Viewer with:
 ViewerActive=Viewer.Init( AsciiFile,  |    ! file label,
             A1:line,                  |    ! file field to display
             Filename,                 |    ! variable file NAME attribute
             ?AsciiBox,                |    ! LIST control number
             GlobalErrors,             |    ! ErrorClass object
             EnableSearch+EnablePrint)      ! features to implement flag
 IF ~ViewerActive THEN RETURN.              !if init unsuccessful, don't
                                            ! call other Viewer methods
 ACCEPT                                     !If init succeeded, proceed
  IF EVENT() = EVENT:CloseWindow
   IF ViewerActive THEN Viewer.Kill.        !If init succeeded, shut down
  END
  !program code
 END
```

See Also: Kill

Kill (shut down the ASCIIViewerClass object)

Kill

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Example:

```
 PROGRAM
 MAP
 END

 INCLUDE('ABASCII.INC')                !declare ASCIIViewer Class

ViewWindow WINDOW('View an ASCII File'),AT(3,7,296,136),SYSTEM,GRAY
       LIST,AT(5,5,285,110),USE(?AsciiBox),IMM
       BUTTON('&Print'),AT(5,120),USE(?Print)
       BUTTON('&Search'),AT(45,120),USE(?Search)
       BUTTON('&Close'),AT(255,120),USE(?Close)
      END

GlobalErrors ErrorClass                !declare GlobalErrors object
Viewer    AsciiViewerClass,THREAD      !declare Viewer object

ViewerActive BYTE(False),THREAD        !Viewer initialized flag
Filename     STRING(255),THREAD        !FileName variable

AsciiFile FILE,DRIVER('ASCII'),NAME(Filename),PRE(A1),THREAD
RECORD     RECORD,PRE()
Line        STRING(255)
           END
          END
 CODE

 GlobalErrors.Init                     !initialize GlobalErrors object
 OPEN(ViewWindow)                      !open the window
 !Initialize Viewer with:
 ViewerActive=Viewer.Init( AsciiFile,  |     ! file label,
              A1:line,                 |     ! file field to display
              Filename,                |     ! variable file NAME attribute
              ?AsciiBox,               |     ! LIST control number
              GlobalErrors,            |     ! ErrorClass object
              EnableSearch+EnablePrint)      ! features to implement flag
 IF ~ViewerActive THEN RETURN.                !if init unsuccessful, don't
                                              ! call other Viewer methods
 ACCEPT                                       !If init succeeded, proceed
```

```
  IF EVENT() = EVENT:CloseWindow
   IF ViewerActive THEN Viewer.Kill.          !If init succeeded, shut down
  END
  !program code
END
```

PageDown (scroll down one page)

PageDown, PROTECTED

The **PageDown** method scrolls the display down one "page." A page is the number of lines displayed in the ASCIIViewerClass object's LIST control.

Example:

```
MyViewerClass.TakeEvent PROCEDURE(UNSIGNED EventNo)
  CODE
  IF FIELD()=SELF.ListBox
    CASE EventNo
    OF EVENT:Scrollup
      SELF.SetLineRelative(-1)
    OF EVENT:ScrollDown
      SELF.SetLineRelative(1)
    OF EVENT:PageUp
      SELF.PageUp
    OF EVENT:PageDown
      SELF.PageDown
    END
  END
```

PageUp (scroll up one page)

PageUp, PROTECTED

The **PageUp** method scrolls the display up one "page." A page is the number of lines displayed in the ASCIIViewerClass object's LIST control.

Example:

```
MyViewerClass.TakeEvent PROCEDURE(UNSIGNED EventNo)
  CODE
  IF FIELD()=SELF.ListBox
    CASE EventNo
    OF EVENT:Scrollup
      SELF.SetLineRelative(-1)
    OF EVENT:ScrollDown
      SELF.SetLineRelative(1)
    OF EVENT:PageUp
      SELF.PageUp
    OF EVENT:PageDown
      SELF.PageDown
    END
  END
```

Reset (reset the ASCIIViewerClass object)

Reset(*filename* **)**

Reset Resets the ASCIIViewerClass object.

filename The label of the ASCIIFile property's NAME attribute variable.

The **Reset** method resets the ASCIIViewerClass object and returns a value indicating whether the end user selected a file or did not select a file. A return value of one (1) indicates a file was selected and *filename* contains its pathname; a retun value of zero (0) indicates no file was selected and *filename* is empty.

Implementation: The Reset method frees the display QUEUE and calls the ASCIIFileClass.Reset method to get a new filename from the end user. Reset refills the display QUEUE and redisplays the list box if a new file was selected.

Return Data Type: BYTE

Example:

```
AsciiFileClass.Init FUNCTION |
  (FILE AsciiFile,*STRING FileLine,*STRING FName,ErrorClass ErrorHandler)

  CODE
  SELF.AsciiFile&=AsciiFile
  SELF.Line&=FileLine
  SELF.ErrorMgr&=ErrorHandler
  SELF.IndexQueue&=NEW(IndexQueue)
  IF ~SELF.Reset(FName)
    SELF.Kill
    RETURN False
  END
  RETURN True
```

See Also: ASCIIFile, ASCIIFileClass.Reset

SetLine (position to specific line)

SetLine(*line number* **), PROTECTED, VIRTUAL**

SetLine	Positions the ASCIIViewerClass object to a specific line.
line number	An integer constant, variable, EQUATE or expresssion that contains the offset or position of the line of text to position to.

The **SetLine** method positions the ASCIIViewerClass object to a specific line within the browsed file.

Implementation: The AskGotoLine method, the ASCIIFileClass.SetPercentile method, and the ASCIISearchClass.Ask method all use the SetLine method to position to the required text line.

Example:

```
MyViewerClass.AskGotoLine PROCEDURE
LineNo  LONG,STATIC
OKGo    BOOL(False)
GotoDialog WINDOW('Goto'),AT(,,96,38),GRAY,DOUBLE
            SPIN(@n_5),AT(36,4,56,13),USE(LineNo),RANGE(1,99999)
            PROMPT('&Line No:'),AT(4,9,32,10),USE(?Prompt1)
            BUTTON('&Go'),AT(8,22,40,14),USE(?GoButton)
            BUTTON('&Cancel'),AT(52,22,40,14),USE(?CancelButton)
           END
  CODE
  OPEN(GotoDialog)
  ACCEPT
    CASE EVENT()
    OF EVENT:Accepted
      CASE ACCEPTED()
      OF ?GoButton
        OKGo=True
        POST(EVENT:CloseWindow)
      OF ?CancelButton
        POST(EVENT:CloseWindow)
      END
    END
  END
  CLOSE(GotoDialog)
  IF OKGo THEN SELF.SetLine(LineNo).
```

See Also: AskGoToLine, ASCIIFileClass.SetPercentile, ASCIISearchClass.Ask

SetLineRelative (move *n* lines)

SetLineRelative(*lines* **), PROTECTED**

SetLineRelative Positions the ASCIIViewerClass object to a relative line.

lines An integer constant, variable, EQUATE or expresssion containing the number of lines to move from the current position. A positive value moves downward; a negative value moves upward.

The **SetLineRelative** method repositions the ASCIIViewerClass object *lines* lines from the current position.

Example:

```
MyViewerClass.TakeScrollOne PROCEDURE(UNSIGNED EventNo)
  CODE
  IF FIELD()=SELF.ListBox
    CASE EventNo
    OF EVENT:Scrollup
      SELF.SetLineRelative(-1)
    OF EVENT:ScrollDown
      SELF.SetLineRelative(1)
    END
  END
```

SetTranslator (set run-time translator:ASCIIViewerClass)

SetTranslator(*translator* **)**

SetTranslator Sets the TranslatorClass object for the AsciiViewerClass object.

translator The label of the TranslatorClass object for this AsciiViewerClass object.

The **SetTranslator** method sets the TranslatorClass object for the AsciiViewerClass object. By specifying a TranslatorClass object for the AsciiViewerClass object, you automatically translate any window or popup menu text displayed by the viewer.

Implementation: The SetTranslator method sets the TranslatorClass object for the PopupClass, AsciiPrintClass, and AsciiSearchClass objects.

Example:

```
Viewer      AsciiViewerClass              !declare Viewer object
Translator  TranslatorClass               !declare Translator object
 CODE
  Translator.Init                         !initialize Translator object
 ViewerActive=Viewer.Init( AsciiFile,     |     ! file label,
             A1:line,                     |     ! file field to display
             Filename,                    |     ! variable file NAME attribute
             ?AsciiBox,                   |     ! LIST control number
             GlobalErrors,                |     ! ErrorClass object
             EnableSearch+EnablePrint)    ! features to implement flag
 IF ~ViewerActive THEN RETURN.            !if init unsuccessful, don't
                                          ! call other Viewer methods
 Viewer.SetTranslator(Translator)         !enable text translation
 !program code
```

TakeEvent (process ACCEPT loop event:ASCIIViewerClass)

TakeEvent(*event* **), PROC**

TakeEvent	Processes an ACCEPT loop event.
event	An integer constant, variable, EQUATE or expresssion containing the event number.

The **TakeEvent** method processes an ACCEPT loop event on behalf of the ASCIIViewerClass object and returns a value indicating whether a CYCLE to the top of the ACCEPT loop is required to properly refresh the display.

Implementation: The TakeEvent method handles resizing, RIGHT-CLICKS, LEFT-CLICKS, and scrolling events.

A return value of zero (0) indicates no CYCLE is needed; any other return value requires a CYCLE.

Return Data Type: BYTE

Example:

```
ACCEPT
  CASE FIELD()
  OF ?AsciiBox
    IF ViewerActive
     IF Viewer.TakeEvent(EVENT())
      CYCLE
     END
    END
  END
END
```

BreakManagerClass

BreakManagerClass - Overview

The BreakManagerClass handles embedded break events for a target report. Each break can perform totaling based on a data element's contents changing. Breaks can be nested, allowing the contents of one break result to determine another break result. Conditional headers and footers can be printed by any break. Each break is totally customizable through available embed points defined in virtual methods.

BreakManagerClass - Concepts

Each embedded break generated by BreakManager is controlled by a template interface in the Report Propeties dialog and through a set of embed points generated. Embedded breaks are designed to give the developer more control "behind the scenes". The BreakManager is not related to the traditional Break logic supported by the structure of the report.

Each break inherits a set of methods and properties defined by an internal LevelManager. An internal break queue stores a unique break and level id which triggers the appropriate break logic.

BreakManagerClass - Relationship to Other Application Builder Classes

ReportManagerClass

The BreakManager class is derived from the ReportManager class.

LevelManagerClass

Each ReportManagerClass utilizing embedded breaks declares a LevelManagerClass to manage the nesting and execution of the embedded break logic.

BreakManagerClass - ABC Template Implementation

The Report template declares a BreakManager when a break is added through the Break tab located in the Report Properties dialog.

BreakManagerClass - Source Files

The BreakManagerClass source code is installed by default to the Clarion \LIBSRC folder. The specific BreakManagerClass source code and their respective components are contained in:

ABBreak.INC	EditClass declarations
ABBreak.CLW	EditClass method definitions

BreakManagerClass - Conceptual Example

The following example shows a sequence of statements to declare, and instantiate a BreakManager object.

```
   MEMBER('people.clw')                                    ! This is a MEMBER module

   INCLUDE('ABBREAK.INC'),ONCE
   INCLUDE('ABBROWSE.INC'),ONCE
   INCLUDE('ABREPORT.INC'),ONCE

                    MAP
                      INCLUDE('PEOPL005.INC'),ONCE        !procedure decl
                    END

PrintPEO:KeyLastName PROCEDURE   ! Generated from procedure template - Report

Progress:Thermometer BYTE                          !
FilesOpened          BYTE                          !
TestCount            LONG                          !
Process:View         VIEW(people)
                       PROJECT(PEO:FirstName)
                       PROJECT(PEO:Gender)
                       PROJECT(PEO:Id)
                       PROJECT(PEO:LastName)
                     END
LocMyFocusControlExT SHORT(0)           !Used by the ENTER Instead of Tab template
LocEnableEnterByTab  BYTE(1)            !Used by the ENTER Instead of Tab template
ProgressWindow       WINDOW('Progress...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
                      PROGRESS,USE(Progress:Thermometer),AT(15,15,111,12),RANGE(0,100)
                      STRING(''),AT(0,3,141,10),USE(?Progress:UserString),CENTER
                      STRING(''),AT(0,30,141,10),USE(?Progress:PctText),CENTER
                      BUTTON('Cancel'),AT(45,42,50,15),USE(?Progress:Cancel)
                     END
```

```
report    REPORT,AT(1000,1540,6000,7458),PRE(RPT),FONT('Arial',10,,),THOUS
           HEADER,AT(1000,1000,6000,542)
           STRING('People by Last Name'),AT(0,20,6000,220),CENTER,FONT(,,,FONT:bold)
           BOX,AT(0,260,6000,280),COLOR(COLOR:Black),FILL(COLOR:Silver)
           LINE,AT(1500,260,0,280),COLOR(COLOR:Black)
           LINE,AT(3000,260,0,280),COLOR(COLOR:Black)
           LINE,AT(4500,260,0,280),COLOR(COLOR:Black)
           STRING('Id'),AT(50,310,1400,170),TRN
           STRING('First Name'),AT(1550,310,1400,170),TRN
           STRING('Last Name'),AT(3050,310,1400,170),TRN
           STRING('Gender'),AT(4550,310,1400,170),TRN
           END
detail     DETAIL,AT(,,6000,281),USE(?unnamed)
           LINE,AT(1500,0,0,280),COLOR(COLOR:Black)
           LINE,AT(3000,0,0,280),COLOR(COLOR:Black)
           LINE,AT(4500,0,0,280),COLOR(COLOR:Black)
           STRING(@S10),AT(50,50,1400,170),USE(PEO:Id),RIGHT(1)
           STRING(@S30),AT(1550,50,1400,170),USE(PEO:FirstName)
           STRING(@S30),AT(3050,50,1400,170),USE(PEO:LastName)
           STRING(@S1),AT(4552,52,240,167),USE(PEO:Gender)
           STRING(@n_4),AT(5208,42),USE(TestCount),RIGHT(1)
           LINE,AT(50,280,5900,0),COLOR(COLOR:Black)
           END
           FOOTER,AT(1000,9000,6000,219)
           STRING(@pPage <<<#p),AT(5250,30,700,135),PAGENO,USE(?PageCount)
           END
          END

ThisWindow           CLASS(ReportManager)
Init                   PROCEDURE(),BYTE,PROC,DERIVED! Method added to host embed code
Kill                   PROCEDURE(),BYTE,PROC,DERIVED! Method added to host embed code
OpenReport             PROCEDURE(),BYTE,PROC,DERIVED! Method added to host embed code
SetAlerts              PROCEDURE(),DERIVED          ! Method added to host embed code
TakeWindowEvent        PROCEDURE(),BYTE,PROC,DERIVED! Method added to host embed code
                     END

ThisReport           CLASS(ProcessClass)            ! Process Manager
TakeRecord             PROCEDURE(),BYTE,PROC,DERIVED! Method added to host embed code
                     END

ProgressMgr          StepStringClass                    ! Progress Manager
Previewer            PrintPreviewClass                  ! Print Previewer
BreakMgr             BreakManagerClass                  ! Break Manager

  CODE
  GlobalResponse = ThisWindow.Run()        !Opens the window and starts an Accept Loop

!---------------------------------------------------------------------------
DefineListboxStyle ROUTINE
!|
!| This routine create all the styles to be shared in this window
!| It's called after the window open
!|
```

```
!-----------------------------------------------------------------------------

ThisWindow.Init PROCEDURE

ReturnValue          BYTE,AUTO

  CODE
  GlobalErrors.SetProcedureName('PrintPEO:KeyLastName')
  SELF.Request = GlobalRequest              ! Store the incoming request
  ReturnValue = PARENT.Init()
  IF ReturnValue THEN RETURN ReturnValue.
  SELF.FirstField = ?Progress:Thermometer
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  CLEAR(GlobalRequest)
  CLEAR(GlobalResponse)
  SELF.AddItem(Translator)
  Relate:people.Open
  ! File people used by this procedure, so make sure it's RelationManager is open
  SELF.FilesOpened = True
  BreakMgr.Init()                   !Initialize the BreakManager object
  BreakMgr.AddBreak()               !A break exists
  BreakMgr.AddLevel()               !People Count is the name of the brteak
  BreakMgr.AddResetField(PEO:Gender)!resets when gender changes
  BreakMgr.AddTotal(TestCount,1)    !Performs a count when break occurs
  SELF.AddItem(BreakMgr)

  OPEN(ProgressWindow)              ! Open window
```

BreakManagerClass - Properties

The BreakManagerClass contains no public properties.

BreakManagerClass - Methods

The BreakManagerClass contains the following methods:

AddBreak (add a Break)

AddBreak( )

AddBreak Identifies to the corresponding report that an embedded break object is active.

The **AddBreak** method identifies that an embedded break object is active for a corresponding report. An internal BreakID number is assigned for each break object created. This BreakID is incremented when a subsequent **AddBreak** method is executed.

Implementation: The AddBreak method is called for each break object that is active for a report. Each object is instantiated from the LevelManagerClass. An AddLevel method follows each AddBreak method.

Example:

```
BreakMgr.AddBreak()                 !First Break
BreakMgr.AddLevel()                 !Auto assign level 1
BreakMgr.AddResetField(PEO:Gender)
BreakMgr.AddTotal(TestCount,1)
BreakMgr.AddBreak()                 !Second Break
BreakMgr.AddLevel() !Break2
```

See Also: Add Level

AddLevel (add a Level to the BreakId Break)

AddLevel(| *breakid* | **)**

AddLevel Assign a level number to the active break.

breakid An integer that identifies which internal break to assign this level to.

The **AddLevel** method identifies the order of break execution that is assigned to a corresponding report. This is used when nested breaks are assigned, and controls which break is executed first.

Implementation: The **AddLevel** method is called after each break is added, directly following the AddBreak method.

Example:

```
BreakMgr.AddBreak()                 !First Break
BreakMgr.AddLevel()                 !Auto assign level 1
BreakMgr.AddResetField(PEO:Gender)
BreakMgr.AddTotal(TestCount,1)
BreakMgr.AddBreak()                 !Second Break
BreakMgr.AddLevel() !Break2
```

See Also: Add Break

AddResetField (add a reset field to the last Level added)

AddResetField(*fieldlabel* **)**

AddResetField	Identify a field to reset on the active break.
fieldlabel	The label of a field that the break will reset

The **AddResetField** method identifies the field whose contents will be reset when a break is executed.

Implementation: The **AddResetField** method is called after each break and level is added, directly following the AddLevel method. In the template interface, it is only active when the **Reset on Break** option is set to TRUE.

Example:

```
BreakMgr.AddBreak()                  !First Break
BreakMgr.AddLevel()                  !Auto assign level 1
BreakMgr.AddResetField(PEO:Gender)   !Reset on break is active
BreakMgr.AddTotal(TestCount,1)
BreakMgr.AddBreak()                  !Second Break
BreakMgr.AddLevel() !Break2
```

See Also: Add Break

AddTotal (add a total field to the last Level added)

AddTotal **(***target, source*, *type*, *reset* **)**
(*target, source, type, reset, condition***)**
(*target, reset* **)**
(*target, reset, condition* **)**

AddTotal	Identify the break total type and optional source/target fields and condition.
target	The label of a field that the total result will be stored into.
source	The label of a field that the total result will be calculated from.
type	A byte that identifies the total type defined for the break. A count type = 1, average type = 2, sum type = 3.
reset	A byte that specifies whether or not the target variable is reset on each break detected. A value of 1 specifies a reset, zero will not reset the target value.
condition	A valid expression that will force a reset when evaluated to TRUE.

The **AddTotal** method is an overloaded method that caluculates three types of conditional or unconditional totaling.

Implementation: The **AddTotal** method is called after each break and level is added, directly following the AddResetField method. In the template interface, it is only active when totaling is added to the break.

Example:

```
BreakMgr.Init()
BreakMgr.AddBreak()
BreakMgr.AddLevel() !Count Break
BreakMgr.AddResetField(PEO:Gender)
BreakMgr.AddTotal(CountValue,1)
BreakMgr.AddBreak()
BreakMgr.AddLevel() !SumBreak
BreakMgr.AddResetField(PEO:Gender)
BreakMgr.AddTotal(SumValue,SourceToTotal,eBreakTotalSum,1)
BreakMgr.AddBreak()
BreakMgr.AddLevel() !ConditionalAverage
BreakMgr.AddResetField(PEO:Gender)
BreakMgr.AddTotal(AverageValue,SourceToAverage,eBreakTotalAve,0,'PEO:Gender = ''M''')
```

Construct (automatic initialization of the BreakManager object)

Construct

The **Construct** method performs the necessary code to initialize the BreakManager object.

Implementation: The Construct method is automatically called when the object is instantiated. The internal break queue is created, and the Break Id is reset to zero.

Destruct (automatic destroy of the Breakmanager object)

Destruct

The **Destruct** method performs the necessary code to destroy the BreakManager object.

Implementation: The Destruct method is automatically called when the object is instantiated. Each break object instantiated in the Init method is cleared from memory.

Init (initialize the BreakManager object)

Init( )

Init Initialize the BreakManager object.

The **Init** method initializes the BreakManager by clearing any prior entries in the internal Break Queue, which holds any breaks defined. Normally, the Destruct method also performs a similar function, but the **Init** method ensures that the Break Queue is clean before calling the report.

Implementation: The **Init** method is called prior to the first AddBreak method.

Example:

```
CODE
GlobalErrors.SetProcedureName('PrintPEO:KeyLastName')
SELF.Request = GlobalRequest    ! Store the incoming request
ReturnValue = PARENT.Init()
IF ReturnValue THEN RETURN ReturnValue.
SELF.FirstField = ?Progress:Thermometer
SELF.VCRRequest &= VCRRequest
SELF.Errors &= GlobalErrors
CLEAR(GlobalRequest)            ! Clear GlobalRequest after storing locally
CLEAR(GlobalResponse)
SELF.AddItem(Translator)
Relate:people.Open
SELF.FilesOpened = True
BreakMgr.Init()
BreakMgr.AddBreak()
```

TakeEnd (Break closed)

TakeEnd ( )

TakeEnd A virtual method called prior to closing an active break.

The **TakeEnd** method is a virtual method that performs any necessary code action prior to the close of the active break.

Implementation: The **TakeEnd** method is used by the ABC templates to print a custom footer detail for the active break. There are embed points available if you need to prime any variables prior to its printing.

Example:

```
BreakMgr.TakeEnd PROCEDURE(SHORT BreakId,SHORT LevelId)

  CODE
     CASE BreakId
         END
     OF 2
         CASE LevelId
         OF 1 !SumBreak
         PRINT(RPT:sumdetail)
         END
     OF 3
         CASE LevelId
         OF 1 !ConditionalAverage
         PRINT(RPT:AverageDetail)
         END
     END
  PARENT.TakeEnd(BreakId,LevelId)
```

TakeStart (Break opened)

TakeStart ( )

TakeStart A virtual method called prior to the start of an active break.

The **TakeStart** method is a virtual method that performs any necessary code action prior to the start of the active break.

Implementation: The **TakeStart** method is used by the ABC templates to print a custom header detail for the active break. There are embed points available if you need to prime any variables prior to its printing.

Example:

```
BreakMgr.TakeStart PROCEDURE(SHORT BreakId,SHORT LevelId)

  CODE
     CASE BreakId
     OF 1
         CASE LevelId
         OF 1 !Count Break
         PRINT(RPT:CountDetail)
         END
     OF 3
         CASE LevelId
            OF 1 !ConditionalAverage
         PRINT(RPT:AverageDetail)
         END
     END
  PARENT.TakeStart(BreakId,LevelId)
```

UpdateTotal (Calculate Break totaling)

UpdateTotal( )

UpdateTotal A virtual method called prior to the start and ending of any break totaling.

The **UpdateTotal** method is a virtual method that performs any necessary code action prior to the start and finish of any totaling defined in an active break.

Implementation:

The **UpdateTotal** method is used by the ABC templates to allow any modifications or extra cleanup of any totaling performed for an active break. The virtual method embeds provide a “Before Totaling” and “After Totaling” embed point for every total defined in each break.

BrowseEIPManagerClass

BrowseEIPManagerClass--Overview

The BrowseEIPManagerClass is an EIPManager that displays an Edit-in-place dialog, and handles events for that dialog. Each BrowseClass utilizing Edit-in-place declares a BrowseEIPManagerClass to manage the events and processes that are used by each Edit-in-place field in the browse.

See Also:

BrowseEIPManagerClass Concepts

BrowseEIPManagerClass--Relationship to Other Application Builder Classes

BrowseEIPManagerClass--ABC Template Implementation

BrowseEIPManagerClass Source Files

BrowseEIPManagerClass--Conceptual Example

BrowseEIPManagerClass Concepts

Each Edit-in-place control is a window created on top of the browse from which it is called. The EIPManager dynamically creates an Edit-in-place object and control upon request (Insert, Change, or Delete) by the end user. When the end user accepts the edited record the EIPManager destroys the edit-in-place object and control.

See Also:

BrowseEIPManagerClass--Relationship to Other Application Builder Classes

BrowseEIPManagerClass--ABC Template Implementation

BrowseEIPManagerClass Source Files

BrowseEIPManagerClass--Conceptual Example

BrowseEIPManagerClass--Relationship to Other Application Builder Classes

EIPManagerClass

The BrowseEIPManager class is derived from the EIPManager class.

BrowseClass

Each BrowseClass utilizing edit-in-place declares a BrowseEIPManagerClass to manage the events and processes that are used by each edit-in-place field in the browse.

The BrowseClass.AskRecord method is the calling method for edit-in-place functionality when edit-in-place is enabled.

EditClass

The BrowseEIPManager provides the basic or "under the hood" interface between the Edit classes and the Browse class. All fields in the browse utilizing customized edit-in-place controls are kept track of by the BrowseEIPManager via the BrowseEditQueue.

BrowseEIPManagerClass--ABC Template Implementation

The Browse template declares a BrowseEIPManager when the BrowseUpdateButtons control template enables default edit-in-place support for the BrowseBox.

See *Control Templates--BrowseBox,* and *BrowseUpdateButton*s for more information.

BrowseEIPManagerClass Source Files

The BrowseEIPManagerClass source code is installed by default to the Clarion \LIBSRC folder. The specific BrowseEIPManagerClass source code and their respective components are contained in:

ABBrowse.INC	EditClass declarations
ABBrowse.CLW	EditClass method definitions
ABBrowse.TRN	EditClass translation strings

BrowseEIPManagerClass--Conceptual Example

The following example shows a sequence of statements to declare, and instantiate a BrowseEIPManager object. The example page-loads a LIST of actions and associated priorities, then edits the list items via edit-in-place. Note that the BrowseClass object declares a BrowseEIPManager which is a refrence to the EIPManager as declared in ABBrowse.INC.

```
   PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABBROWSE.INC'),ONCE
   INCLUDE('ABEIP.INC'),ONCE
   INCLUDE('ABWINDOW.INC'),ONCE
   MAP
   END

Actions              FILE,DRIVER('TOPSPEED'),PRE(ACT),CREATE,BINDABLE,THREAD
KeyAction                KEY(ACT:Action),NOCASE,OPT
Record                   RECORD,PRE()
Action                      STRING(20)
Priority                    DECIMAL(2)
Completed                   DECIMAL(1)
                         END
                     END

Access:Actions       &FileManager
Relate:Actions       &RelationManager
GlobalErrors         ErrorClass
GlobalRequest        BYTE(0),THREAD
ActionsView   VIEW(Actions)
              END

Queue:Browse  QUEUE
ACT:Action     LIKE(ACT:Action)
ACT:Priority   LIKE(ACT:Priority)
ViewPosition   STRING(1024)
              END
BrowseWindow WINDOW('Browse Records'),AT(0,0,247,140),SYSTEM,GRAY
               LIST,AT(5,5,235,100),USE(?List),IMM,HVSCROLL,MSG('Browsing Records'),|
               FORMAT('80L~Action~@S20@8R~Priority~L@N2@'),FROM(Queue:Browse)
               BUTTON('&Insert'),AT(5,110,40,12),USE(?Insert),KEY(InsertKey)
               BUTTON('&Change'),AT(50,110,40,12),USE(?Change),KEY(CtrlEnter),DEFAULT
               BUTTON('&Delete'),AT(95,110,40,12),USE(?Delete),KEY(DeleteKey)
              END
```

```
ThisWindow  CLASS(WindowManager)
Init                        PROCEDURE(),BYTE,PROC,DERIVED
Kill                        PROCEDURE(),BYTE,PROC,DERIVED
            END

BRW1 CLASS(BrowseClass)
Q    &Queue:Browse
Init PROCEDURE|
(SIGNED ListBox,*STRING Posit,VIEW V,QUEUE Q,RelationManager RM,WindowManager WM)
     END

BRW1::EIPManager     BrowseEIPManager

  CODE
  GlobalErrors.Init
  Relate:Actions.Init
  GlobalResponse = ThisWindow.Run()
  Relate:Actions.Kill
  GlobalErrors.Kill

ThisWindow.Init PROCEDURE

ReturnValue          BYTE,AUTO
  CODE
  SELF.Request = GlobalRequest
  ReturnValue =PARENT.Init()
  IF ReturnValue THEN RETURN ReturnValue.
  SELF.FirstField = ?List
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  SELF.AddItem(Toolbar)
  CLEAR(GlobalRequest)
  CLEAR(GlobalResponse)
  Relate:Actions.Open
  FilesOpened = True
  BRW1.Init|
  (?List,Queue:Browse.ViewPosition,BRW1::View:Browse,Queue:Browse,Relate:Actions,SELF)
  OPEN(BrowseWindow)
  SELF.Opened=True
  BRW1.Q &= Queue:Browse
  BRW1.AddSortOrder(,ACT:KeyAction)
  BRW1.AddLocator(BRW1::Sort0:Locator)
  BRW1::Sort0:Locator.Init(,ACT:Action,1,BRW1)
  BRW1.AddField(ACT:Action,BRW1.Q.ACT:Action)
  BRW1.AddField(ACT:Priority,BRW1.Q.ACT:Priority)
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
```

```
  BRW1.DeleteControl=?Delete
  BRW1.AddToolbarTarget(Toolbar)
  SELF.SetAlerts()
  RETURN ReturnValue


ThisWindow.Kill PROCEDURE

ReturnValue          BYTE,AUTO
  CODE
  ReturnValue =PARENT.Kill()
  IF ReturnValue THEN RETURN ReturnValue.
  IF FilesOpened
    Relate:Actions.Close
  END
  RETURN ReturnValue




BRW1.Init PROCEDURE(SIGNED ListBox,*STRING Posit,VIEW V,QUEUE Q,RelationManager|
RM,WindowManager WM)

  CODE
  PARENT.Init(ListBox,Posit,V,Q,RM,WM)
  SELF.EIP &= BRW1::EIPManager
```

BrowseEIPManagerClass Properties

BrowseEIPManagerClass Properties

The BrowseEIPManagerClass contains the following property and inherits all the properties of the EIPManagerClass.

BC (browse class)

BC &BrowseClass, PROTECTED

The **BC** property is a reference to the calling BrowseClass object.

BrowseEIPManagerClass Methods

BrowseEIPManagerClass--Functional Organization--Expected Use

As an aid to understanding the EIPManagerClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EIPManagerClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init D	initialize the BrowseEditClass object
Kill D	shut down the BrowseEditClass object

Mainstream Use:

TakeNewSelection D	handle Event:NewSelections

Occasional Use:

ClearColumn D	reset column property values
TakeCompleted D	process completion of edit

D These methods are also Derived

Derived Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are derived, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init D	initialize the BrowseEditClass object
Kill D	shut down the BrowseEditClass object
TakeNewSelection D	handle Event:NewSelections
ClearColumn D	reset column property values
TakeCompleted D	process completion of edit

ClearColumn (reset column property values)

ClearColumn, DERIVED

The **ClearColumn** method checks for a value in the LastColumn property and conditionally sets the column values to 0.

The TakeCompleted method calls the ClearColumn method.

Example:

```
BrowseEIPManager.TakeCompleted PROCEDURE(BYTE Force)
SaveAns UNSIGNED,AUTO
Id      USHORT,AUTO
  CODE
  SELF.Again = 0
  SELF.ClearColumn
  SaveAns = CHOOSE(Force = 0,Button:Yes,Force)
  IF SELF.Fields.Equal()
    SaveAns = Button:No
  ELSE
    IF ~Force
      SaveAns =  SELF.Errors.Message(Msg:SaveRecord,|
                 Button:Yes+Button:No+Button:Cancel,Button:Yes)
    END
  END
 ! code to handle user input from SaveRecord message
```

See Also: Column

Init (initialize the BrowseEIPManagerClass object)

Init, DERIVED, PROC

The **Init** method initializes the BrowseEIPManagerClass object.

Implementation: The Init method primes variables and calls the InitControls method which then initializes the appropriate edit-in-place controls. It is indirectly called by the BrowseClass.AskRecord method via a call to an inherited Run method.

Return Data Type: BYTE

Example:

```
WindowManager.Run PROCEDURE
  CODE
  IF ~SELF.Init()
    SELF.Ask
  END
  SELF.Kill
  RETURN CHOOSE(SELF.Response=0,RequestCancelled,SELF.Response)
```

See Also: BrowseClass.ResetFromAsk

Kill (shut down the BrowseEIPManagerClass object)

Kill, DERIVED, PROC

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code. The Kill method must leave the object in a state in which it can be initialized.

Implementation: The Kill method calls the BrowseClass.ResetFromAsk method.

Return Data Type: BYTE

Example:

```
WindowManager.Run PROCEDURE
  CODE
  IF ~SELF.Init()
    SELF.Ask
  END
  SELF.Kill
  RETURN CHOOSE(SELF.Response=0,RequestCancelled,SELF.Response)
```

See Also: BrowseClass.ResetFromAsk

TakeCompleted (process completion of edit)

TakeCompleted(*force*), DERIVED

TakeCompleted Determines the edit-in-place dialog's action after either a loss of focus or an end user action.

force An integer constant, variable, EQUATE, or expression that indicates the record being edited should be saved without prompting the end user.

The **TakeCompleted** method either saves the record being edited and end the edit-in-place process, or prompts the end user to save the record and end the edit-in-place process, cancel the changes and end the edit-in-place process, or remain editing.

Implementation: The EIPManager.TakeFocusLoss and EIPManager.TakeAction methods call the TakeCompleted method.

Note: TakeCompleted does not override the WindowManager.TakeCompleted method.

Example:

```
EIPManager.TakeFocusLoss PROCEDURE
CODE
CASE CHOOSE(SELF.FocusLoss&=NULL,EIPAction:Default,BAND(SELF.FocusLoss,EIPAction:Save))
 OF EIPAction:Always OROF EIPAction:Default
   SELF.TakeCompleted(Button:Yes)
 OF EIPAction:Never
   SELF.TakeCompleted(Button:No)
 ELSE
   SELF.TakeCompleted(0)
END
```

See Also: EIPManager.TakeFocusLoss, EIPManager.TakeAction

TakeNewSelection (reset edit-in-place column)

TakeNewSelection, DERIVED, PROC

The **TakeNewSelection** method resets the edit-in-place column selected by the end user.

Implementation: TakeNewSelection calls ResetColumn, and returns a Level:Benign.

Return Data Type: BYTE

Example:

```
WindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
    IF ~FIELD()
      RVal = SELF.TakeWindowEvent()
      IF RVal THEN RETURN RVal.
    END
    CASE EVENT()
    OF EVENT:Accepted
      RVal = SELF.TakeAccepted()
    OF EVENT:Rejected
      RVal = SELF.TakeRejected()
    OF EVENT:Selected
      RVal = SELF.TakeSelected()
    OF EVENT:NewSelection
      RVal = SELF.TakeNewSelection()
    OF EVENT:AlertKey
      IF SELF.HistoryKey AND KEYCODE() = SELF.HistoryKey
        SELF.RestoreField(FOCUS())
      END
    END
    IF RVal THEN RETURN RVal.
```

See Also: ResetColumn

BrowseClass

BrowseClass Overview

The BrowseClass is a ViewManager with a user interface for navigating through the result set of the underlying VIEW.

BrowseClass Concepts

The BrowseClass uses several related classes to provide standard browse functionality--that is, file-loaded or page-loaded lists with automatic scrolling, searching, ranging, filtering, resets, conditional colors, conditional icons, etc. These classes can be used to build other components and functionality as well.

Added to this standard functionality, is Edit-In-Place--that is, you can update the VIEW's primary file by typing directly into the browse list. No separate update procedure is required, and the updates are appropriately autoincremented, referentially constrained, and field validated.

Following are the classes that provide this browse functionality. The classes and their respective roles are:

BrowseClass	Browse list "supervisor" class
StepClass	Scrollbar/Progress Bar base class
LongStepClass	Numeric Runtime distribution
RealStepClass	Numeric Runtime distribution
StringStepClass	Alpha/Lastname distribution
CustomStepClass	Custom distribution
LocatorClass	Locator base class
StepLocatorClass	Step Locator
EntryLocatorClass	Entry Locator
IncrementalLocatorClass	Incremental Locator
FilterLocatorClass	Filter Locator
EditClass	Edit-In-Place

The BrowseClass is fully documented in the remainder of this chapter. Each related class is documented in its own chapter.

BrowseClass Relationship to Other Application Builder Classes

The BrowseClass is closely integrated with several other ABC Library objects--in particular the WindowManager and ToolbarClass objects. These objects register their presence with each other, set each other's properties, and call each other's methods as needed to accomplish their respective tasks.

The BrowseClass is derived from the ViewManager, plus it relies on many of the other Application Builder Classes (RelationManager, FieldPairsClass, ToolbarClass, PopupClass, etc.) to accomplish its tasks. Therefore, if your program instantiates the BrowseClass, it must also instantiate these other classes. Much of this is automatic when you INCLUDE the BrowseClass header (ABBROWSE.INC) in your program's data section. See the *Conceptual Example*.

BrowseClass ABC Template Implementation

The ABC Templates automatically include all the classes and generate all the code necessary to support the functionality specified in your application's Browse Procedure and BrowseBox Control templates.

The templates *derive* a class from the BrowseClass for *each* BrowseBox in the application. By default, the derived class is called BRW# where # is the BrowseBox control template instance number. This derived class object supports all the functionality specified in the BrowseBox template.

The derived BrowseClass is local to the procedure, is specific to a single BrowseBox and relies on the global file-specific RelationManager and FileManager objects for the browsed files. The templates provide the derived class so you can customize the BrowseBox behavior on a per-instance basis. See *Control Templates--BrowseBox* for more information.

BrowseClass Source Files

The BrowseClass source code is installed by default to the Clarion \LIBSRC folder. The specific BrowseClass source code and their respective components are contained in:

ABBROWSE.INC	BrowseClass declarations
ABBROWSE.CLW	BrowseClass method definitions
ABBROWSE.TRN	BrowseClass translation strings

BrowseClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a BrowseClass object and related objects. The example initializes and page-loads a LIST, then handles a number of associated events, including searching, scrolling, and updating. When they are initialized properly, the BrowseClass and WindowManager objects do most of the work (default event handling) internally.

```
   PROGRAM
   INCLUDE('ABWINDOW.INC')              !declare WindowManager class
   INCLUDE('ABBROWSE.INC')              !declare BrowseClass
   MAP
   END

State     FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey  KEY(ST:STATECODE),NOCASE,OPT
Record        RECORD,PRE()
STATECODE      STRING(2)
STATENAME      STRING(20)
              END
          END

StView    VIEW(State)               !declare VIEW for BrowseSt
          END

StateQ    QUEUE                     !declare Q for LIST
ST:STATECODE  LIKE(ST:STATECODE)
ST:STATENAME  LIKE(ST:STATENAME)
ViewPosition  STRING(512)
          END

GlobalErrors ErrorClass             !declare GlobalErrors object
Access:State CLASS(FileManager)           !declare Access:State object
Init      PROCEDURE
             END
Relate:State CLASS(RelationManager)       !declare Relate:State object
Init      PROCEDURE
             END
VCRRequest  LONG(0),THREAD

ThisWindow CLASS(WindowManager)           !declare ThisWindow object
Init     PROCEDURE(),BYTE,PROC,VIRTUAL
Kill     PROCEDURE(),BYTE,PROC,VIRTUAL
           END
BrowseSt  CLASS(BrowseClass)              !declare BrowseSt object
Q       &StateQ
          END
```

```
StLocator  StepLocatorClass               !declare StLocator object
StStep     StepStringClass                !declare StStep object

StWindow WINDOW('Browse States'),AT(,,123,152),IMM,SYSTEM,GRAY
          LIST,AT(8,5,108,124),USE(?StList),IMM,HVSCROLL,FROM(StateQ),|
          FORMAT('27L(2)|M~CODE~@s2@80L(2)|M~STATENAME~@s20@')
          BUTTON('&Insert'),AT(8,133),USE(?Insert)
          BUTTON('&Change'),AT(43,133),USE(?Change),DEFAULT
          BUTTON('&Delete'),AT(83,133),USE(?Delete)
         END
 CODE
 ThisWindow.Run()                  !run the window procedure

ThisWindow.Init  PROCEDURE()       !initialize things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()       !call base class init
 IF ReturnValue THEN RETURN ReturnValue.
 GlobalErrors.Init                 !initialize GlobalErrors object
 Relate:State.Init                 !initialize Relate:State object
 SELF.FirstField = ?StList         !set FirstField for ThisWindow
 SELF.VCRRequest &= VCRRequest     !VCRRequest not used
 SELF.Errors &= GlobalErrors       !set error handler for ThisWindow
 Relate:State.Open                 !open State and related files
 !Init BrowseSt object by naming its LIST,VIEW,Q,RelationManager & WindowManager
 BrowseSt.Init(?StList,StateQ.ViewPosition,StView,StateQ,Relate:State,SELF)
 OPEN(StWindow)
 SELF.Opened=True
 BrowseSt.Q &= StateQ              !reference the browse QUEUE
 !initialize the StStep object
 StStep.Init(+ScrollSort:AllowAlpha,ScrollBy:Runtime)
 !set the browse sort order
 BrowseSt.AddSortOrder(StStep,ST:StateCodeKey)
 BrowseSt.AddLocator(StLocator)    !plug in the browse locator
 StLocator.Init(,ST:STATECODE,1,BrowseSt)      !initialize the locator
 BrowseSt.AddField(ST:STATECODE,BrowseSt.Q.ST:STATECODE) !set a column to browse
 BrowseSt.AddField(ST:STATENAME,BrowseSt.Q.ST:STATENAME) !set a column to browse
 BrowseSt.InsertControl=?Insert    !set the control to add records
 BrowseSt.ChangeControl=?Change    !set the control to change records
 BrowseSt.DeleteControl=?Delete    !set the control to delete records
 SELF.SetAlerts()                  !alert any keys for ThisWindow
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()       !shut down things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()       !call base class shut down
```

```
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Close                !close State and related files
 Relate:State.Kill                 !shut down Relate:State object
 GlobalErrors.Kill                 !shut down GlobalErrors object
 RETURN ReturnValue

Access:State.Init PROCEDURE
 CODE
 PARENT.Init(State,GlobalErrors)
 SELF.FileNameValue = 'State'
 SELF.Buffer &= ST:Record
 SELF.AddKey(ST:StateCodeKey,'ST:StateCodeKey',0)

Relate:State.Init PROCEDURE
 CODE
 Access:State.Init
 PARENT.Init(Access:State,1)
```

BrowseClass Properties

BrowseClass Properties

The BrowseClass inherits all the properties of the ViewManager from which it is derived. See *ViewManager Properties* for more information.

In addition to the inherited properties, the BrowseClass contains the following properties:

ActiveInvisible (obscured browse list action)

ActiveInvisible BYTE

The **ActiveInvisible** property indicates whether to fill or refill the browse queue when the browse LIST is "invisible" because it is on a non-selected TAB or is otherwise hidden. A value of one (1) refills the queue when the LIST is invisible; a value of zero (0) suppresses the refill.

Setting ActiveInvisible to zero (0) improves performance for procedures with "invisible" browse lists; however, buffer contents for the invisible browse list are not current and should not be relied upon.

Implementation: The ResetQueue method implements the behavior specified by the ActiveInvisible property.

See Also: ResetQueue

AllowUnfilled (display filled list)

AllowUnfilled BYTE

The **AllowUnfilled** property indicates whether to always display a "full" list, or to allow a partially filled list when the result set "ends" in mid-list. A value of one (1) displays a partially filled list and improves performance by suppressing any additional reads needed to fill the list; a value of zero (0) always displays a filled list.

Setting AllowUnfilled to one (1) improves performance for browse lists, especially for those using SQL data.

Implementation: The ResetQueue method implements the behavior specified by the AllowUnfilled property.

See Also: ResetQueue

ArrowAction (edit-in-place action on arrow key)

ArrowAction BYTE

The **ArrowAction** property indicates the action to take when the end user presses the up or down arrow key during an edit-in-place process. There are three types of actions that ArrowAction controls:

what to do with any changes (default, save, abandon, or prompt),
what mode to use next (continue editing or revert to non-edit mode),
what column to edit next (current column or first editable column).

The specified actions are implemented by the Ask method. Set the actions by assigning, adding, or subtracting the following EQUATEd values to ArrowAction. The following EQUATEs are in ABBROWSE.INC:

```
      ITEMIZE,PRE(EIPAction)
Default      EQUATE(0)       !save according to the Ask method
Always       EQUATE(1)       !always save the changes
Never        EQUATE(2)       !never save the changes
Prompted     EQUATE(4)       !ask whether to save the changes
Remain       EQUATE(8)       !continue editing
RetainColumn EQUATE(16)      !maintain column position in new row
      END
```

Example:

```
BRW1.ArrowAction = EIPAction:Prompted                      !ask to save changes
BRW1.ArrowAction = EIPAction:Prompted+EIPAction:Remain     !ask to save, keep editing
                                                           !1st editable column
BRW1.ArrowAction = EIPAction:Remain+EIPAction:RetainColumn!default save, keep editing
                                                           !same column
```

See Also: Ask

AskProcedure (update procedure)

AskProcedure USHORT

The **AskProcedure** property identifies the procedure to update a browse item. A value of zero (0) uses the BrowseClass object's own AskRecord method to do updates. Any other value uses a separate procedure registered with the WindowManager object.

Implementation: Typically, the WindowManager object (Init method) sets the value of the AskProcedure property when a separate update procedure is needed. The Ask method passes the AskProcedure value to the WindowManager.Run method to indicate which procedure to execute.

See Also: Ask, AskRecord, WindowManager.Run

ChangeControl (browse change/update control number)

ChangeControl SIGNED

The **ChangeControl** property contains the number of the browse's change/update control. This is typically the value of the Change BUTTON's field equate. The BrowseClass methods use this value to enable and disable the control when appropriate, to post events to the control, to map change behavior to corresponding popup menu choices, etc.

Implementation: The BrowseClass.Init method does not initialize the ChangeControl property. You should initialize the ChangeControl property after the BrowseClass.Init method is called. See the *Conceptual Example*.

See Also: UpdateToolbarButtons

CurrentChoice (current LIST control entry number)

CurrentChoice LONG, PROTECTED

The **CurrentChoice** property represents the entry number of the highlighted record in a LIST control.

Implementation: The CurrentChoice property is updated as the scroll bar for the LIST control is moved within the Listbox.

DeleteAction (edit-in-place action on delete key)

DeleteAction BYTE

The **DeleteAction** property indicates the action to take when the end user presses the DELETE key during an edit-in-place process. **DeleteAction** controls what mode to use next (continue editing or revert to non-edit mode).

The specified actions are implemented by the Ask method. Set the actions by assigning, adding, or subtracting the following EQUATEd values to ArrowAction. The following EQUATEs are in ABBROWSE.INC:

```
      ITEMIZE,PRE(EIPAction)
Default   EQUATE(0)       !save according to the Ask method
Always    EQUATE(1)       !always save the changes
Never     EQUATE(2)       !never save the changes
Prompted  EQUATE(4)       !ask whether to save the changes
Remain    EQUATE(8)       !continue editing

      END
```

DeleteControl (browse delete control number)

DeleteControl SIGNED

The **DeleteControl** property contains the number of the browse's delete control. This is typically the value of the Delete BUTTON's field equate. The BrowseClass methods use this value to enable and disable the control when appropriate, to post events to the control, to map delete behavior to corresponding popup menu choices, etc.

Implementation: The BrowseClass.Init method does not initialize the DeleteControl property. You should initialize the DeleteControl property after the BrowseClass.Init method is called. See the *Conceptual Example*.

See Also: UpdateToolbarButtons

EditList (list of edit-in-place controls)

EditList &BrowseEditQueue, PROTECTED

The **EditList** property is a reference to a structure containing a list of edit-in-place classes for use with specific browse list columns.

The AddEditControl method adds new edit-in-place classes and their associated browse list columns to the EditList property.

Implementation: You do not need to initialize this property to implement the default edit-in-place controls. The EditList property supports custom edit-in-place controls.

The EditList property is a reference to a QUEUE declared in ABBROWSE.INC as follows:

```
BrowseEditQueue QUEUE,TYPE
Field             UNSIGNED
FreeUp            BYTE
Control           &EditClass
                  END
```

See Also: AddEditControl

EIP (edit-in-place manager)

EIP &BrowseEIPManager

The **EIP** property is a reference to the BrowseEIPManager class used by this BrowseClass object.

See Also: Init

EnterAction (edit-in-place action on enter key)

EnterAction BYTE

The **EnterAction** property indicates the action to take when the end user presses the ENTER key during an edit-in-place process.There are two types of actions that EnterAction controls:

what to do with any changes (default, save, abandon, or prompt),
what mode to use next (continue editing or revert to non-edit mode).

The specified actions are implemented by the Ask method. Set the actions by assigning, adding, or subtracting the following EQUATEd values to ArrowAction. The following EQUATEs are in ABBROWSE.INC:

```
      ITEMIZE,PRE(EIPAction)
Default   EQUATE(0)       !save according to the Ask method
Always    EQUATE(1)       !always save the changes
Never     EQUATE(2)       !never save the changes
Prompted  EQUATE(4)       !ask whether to save the changes
Remain    EQUATE(8)       !continue editing
      END
```

Example:

```
BRW1.EnterAction = EIPAction:Prompted       !ask to save changes
BRW1.EnterAction = EIPAction:Prompted+EIPAction:Remain !ask to save, keep
editing
```

See Also: Ask

FocusLossAction (edit-in-place action on lose focus)

FocusLossAction BYTE

The **FocusLossAction** property indicates the action to take with regard to pending changes when the edit control loses focus during an edit-in-place process.

The specified action is implemented by the Ask method. Set the action by assigning, adding, or subtracting one of the following EQUATEd values to FocusLossAction. The following EQUATEs are in ABBROWSE.INC:

```
      ITEMIZE,PRE(EIPAction)
Default    EQUATE(0)       !save according to the Ask method
Always     EQUATE(1)       !always save the changes
Never      EQUATE(2)       !never save the changes
Prompted   EQUATE(4)       !ask whether to save the changes
      END
```

Example:

```
BRW1.FocusLossAction = EIPAction:Prompted     !ask to save changes
```

See Also: Ask

HasThumb (vertical scroll bar flag)

HasThumb BYTE

The **HasThumb** property indicates whether BrowseClass object's LIST control has a vertical scroll bar. A value of one (1) indicates a scroll bar; a value of zero (0) indicates no scroll bar.

Implementation: The SetAlerts method sets the value of the HasThumb property. The UpdateThumb method uses the HasThumb property to implement correct thumb and scroll bar behavior.

See Also: ListControl, SetAlerts, UpdateThumb

HideSelect (hide select button)

HideSelect BYTE

The **HideSelect** property indicates whether to HIDE the Select button (as indicated by the SelectControl property) when the browse is called for update purposes (as indicated by the Selecting property). A value of one (1) hides the select button; a value of zero (0) always displays the select button.

Implementation: The ResetQueue method implements the behavior specified by the HideSelect property.

See Also: ResetQueue, SelectControl, Selecting

ILC(reference to IListControl interface)

ILC &IListControl

The **ILC** property is a reference to the IListControl interface which is passed to the Init method. The IListControl interface is used to implement standard behaviors for a listbox. See the IListControl interface section for more information.

Implementation: The Init method creates an instance of ILC for the list control. The Kill method disposes of that interface instance.

See Also: BrowseClass.Init, BrowseClass.Kill

InsertControl (browse insert control number)

InsertControl SIGNED

The **InsertControl** property contains the number of the browse's insert control. This is typically the value of the Insert BUTTON's field equate. The BrowseClass methods use this value to enable and disable the control when appropriate, to post events to the control, to map Insert behavior to corresponding popup menu choices, etc.

Implementation: The BrowseClass.Init method does not initialize the InsertControl property. You should initialize the InsertControl property after the BrowseClass.Init method is called. See the *Conceptual Example*.

See Also: UpdateToolbarButtons

ListQueue (browse data queue reference)

ListQueue &BrowseQueue, PROTECTED

The **ListQueue** property is a reference to a structure that is the source of the data elements displayed in the browse LIST.

The BrowseClass.Init method initializes the ListQueue property. See the *Conceptual Example*.

See Also: Init

Loaded (browse queue loaded flag)

Loaded BYTE, PROTECTED

The **Loaded** property contains a value that indicates whether or not the BrowseClass object has tried to load the browse list queue. The BrowseClass uses this property to ensure the browse queue gets loaded and to avoid redundant reloads.

Popup (browse popup menu reference)

Popup &PopupClass

The **Popup** property is a reference to the PopupClass class used by this BrowseClass object.

Implementation: Because it directly references the PopupClass, the BrowseClass header INCLUDEs the PopupClass header. That is, the BrowseClass's implementation of the PopupClass is automatic. You need take no action.

The BrowseClass.Init method instantiates the PopupClass object referenced by the Popup property. See the *Conceptual Example*.

See Also: Init

PrevChoice (prior LIST control entry number)

PrevChoice LONG, PROTECTED

The **PrevChoice** property represents the entry number of the previously selected record in a LIST control.

Implementation: The PrevChoice property is updated as the scroll bar for the LIST control is moved within the Listbox.

PrintControl (browse print control number)

PrintControl SIGNED

The **PrintControl** property contains the number of the browse's print control. This is typically the value of the Print BUTTON's field equate. The BrowseClass methods use this value to enable and disable the control when appropriate, to post events to the control, to map Print behavior to corresponding popup menu choices, etc.

Implementation: The BrowseClass.Init method does not initialize the PrintControl property. You should initialize the PrintControl property after the BrowseClass.Init method is called. See the *Conceptual Example*.

See Also: UpdateToolbarButtons

PrintProcedure (print procedure)

PrintProcedure USHORT

The **PrintProcedure** property identifies the procedure to execute when the Browse Print action is called. The procedure name is registered with the WindowManager object.

Implementation: Typically, the WindowManager object (Init method) sets the value of the PrintProcedure property when a Browse Print is called. The Ask method passes the AskProcedure value to the WindowManager.Run method to indicate which procedure to execute.

See Also: Ask
AskRecord
WindowManager.Run

Processors (reference to ProcessorQueue)

ListQueue &QUEUE, PROTECTED

The **Processors** property is a reference to the ProcessorQueue queue which contains references to the RecordProcessor interface and manages several processes.

See Also: BrowseClass.Init, BrowseClass.Kill

Query (reference to QueryClass)

Query &QueryClass

The **Query** property is a reference to the QueryClass which manages Query-by-Example processes for the BrowseClass.

See Also: BrowseClass.Init
BrowseClass.Kill

QueryControl (browse query control number)

QueryControl SIGNED

The **QueryControl** property contains the number of the browse's query (QBE) control. This is typically the value of the QBE BUTTON's field equate. The BrowseClass methods use this value to enable and disable the control when appropriate, to post events to the control, to map QBE behavior to corresponding popup menu choices, etc.

Implementation: The BrowseClass.Init method does not initialize the QueryControl property. You should initialize the QueryControl property after the BrowseClass.Init method is called. See the *Conceptual Example*.

See Also: UpdateToolbarButtons

QueryShared (share query with multiple sorts)

QueryShared BYTE

The **QueryShared** property contains a value that tells the BrowseClass whether or not to keep queries active when changing different sort orders. An example of this is when switching from one tab control to another in the active browse.

A value of zero (0) disables sharing (the query is only active for the tab in which it is set); a value of 1 enables sharing.

Implementation: The QueryShared property is ser by the Query Button template interface when the **Auto-share between tabs** option is checked.

QuickScan (buffered reads flag)

QuickScan BYTE

The **QuickScan** property contains a value that tells the BrowseClass whether or not to quickscan when page-loading the browse list queue. Quick scanning only affects file systems that use multi-record buffers. See *Database Drivers* for more information.

A value of zero (0) disables quick scanning; a non-zero value enables quick scanning. Quick scanning is the normal way to read records for browsing. However, rereading the buffer may provide slightly improved data integrity in some multi-user circumstances at the cost of substantially slower reads.

Implementation: TheBrowseClass.Fetch method implements the faster reads only during the page-loading process, and only if the QuickScan property is not zero. The BrowseClass.Fetch method SENDs the 'QUICKSCAN=ON' driver string to the applicable files' database drivers with the RelationManager.SetQuickScan method.

Note: The RelationManager.SetQuickScan method does *not* set the BrowseClass.QuickScan property. However if you set the BrowseClass.QuickScan property to 1, the BrowseClass uses the RelationManager.SetQuickScan method to SEND the QUICKSCAN driver string to the appropriate files.

See Also: Fetch, RelationManager.SetQuickScan.

RetainRow (highlight bar refresh behavior)

RetainRow BYTE

The **RetainRow** property indicates whether the BrowseClass object tries to maintain the highlight bar in the same list row following a change in sort order, an update, or other browse refresh action. A value of one (1) maintains the current highlight bar row; a value of zero (0) lets the highlight bar move to the first row.

Setting RetainRow to one (1) can cause a performance penalty in applications using TopSpeed's pre-Accelerator ODBC driver.

Implementation: The Init method sets the RetainRow property to one (1). The ResetQueue method implements the behavior specified by the RetainRow property.

See Also: Init, ResetQueue

SelectControl (browse select control number)

SelectControl SIGNED

The **SelectControl** property contains the number of the browse's select control. This is typically the value of the Select BUTTON's field equate. The BrowseClass methods use this value to enable and disable the control when appropriate, to post events to the control, to map Select behavior to corresponding popup menu choices, etc.

Implementation: The BrowseClass.Init method does not initialize the SelectControl property. You should initialize the SelectControl property after the BrowseClass.Init method is called. See the *Conceptual Example*.

See Also: UpdateToolbarButtons

Selecting (select mode only flag)

Selecting BYTE

The **Selecting** property indicates whether the BrowseClass object selects a browse item or updates browse items. A value of zero (0) sets update mode; a value of one (1) sets select only mode.

The HideSelect property is only effective when the Selecting property indicates update mode.

Implementation: In select mode, a DOUBLE-CLICK or ENTER selects the item; otherwise, a DOUBLE-CLICK or ENTER updates the item.

See Also: HideSelect

SelectWholeRecord (select entire record flag)

SelectWholeRecord BYTE

The **SelectWholeRecord** property indicates whether an UpdateViewRecord should be called in the TakeEvent method. A value of one (1) will get the whole record from the view; a value of zero (0), the default, gets the record from the buffer.

See Also: UpdateViewRecord, TakeEvent

Sort (browse sort information)

Sort &BrowseSortOrder

The **Sort** property is a reference to a structure containing all the sort information for this BrowseClass object. The BrowseClass methods use this property to implement multiple sort orders, range limits, filters, and locators for a single browse list.

Implementation: The BrowseClass.Sort property mimics or shadows the inherited ViewManager.Order property. The Sort property is a reference to a QUEUE declared in ABBROWSE.INC as follows:

```
BrowseSortOrder QUEUE(SortOrder),TYPE !browse sort information
Locator          &LocatorControl      !locator for this sort order
Resets           &FieldPairsClass     !reset fields for this sort order
Thumb            &ThumbClass          !ThumbClass for this sort order
                 END
```

Notice this BrowseSortOrder queue contains all the fields in the SortOrder queue declared in ABFILE.INC as follows:

```
SortOrder    QUEUE,TYPE      !VIEW sort information
Filter        &FilterQueue   !ANDed filter expressions
FreeElement   ANY            !The Free key element
LimitType     BYTE           !Range limit type flag
MainKey       &KEY           !The KEY
Order         &STRING        !ORDER expression (equal to KEY)
RangeList     &FieldPairsClass  !fields in the range limit
              END
```

And the SortOrder queue contains a reference to the FilterQueue declared in ABFILE.INC as follows:

```
FilterQueue   QUEUE,TYPE     !VIEW filter information
ID             STRING(30)    !filter ID
Filter         &STRING       !filter expression
               END
```

So, the BrowseSortOrder queue is, among other things, a queue of queues.

The AddSortOrder method defines sort orders for the browse. The SetSort method applies or activates a sort order for the browse. Only one sort order is active at a time.

See Also: AddSortOrder, SetSort

StartAtCurrent (initial browse position)

StartAtCurrent BYTE

The **StartAtCurrent** property indicates whether the BrowseClass object initially positions to the first item in the sort order or positions to the item specified by the contents of the Browse's view buffer. A value of zero (0 or False) positions to the first item; a value of one (1 or True) positions to the item specified by the contents of the view buffer.

Implementation: The SetSort method implements the StartAtCurrent initial position. The SetSort method positions the browse list based on the contents of the fields in the active sort order, including the free element field.

Example:

```
BRW1.StartAtCurrent = True
ST:StateCode = 'K'                  !set key component value
BrowseSt.Init(?StList,StateQ.ViewPosition,StView,StateQ,Relate:State,SELF)
```

See Also: SetSort

TabAction (edit-in-place action on tab key)

TabAction BYTE

The **TabAction** property indicates the action to take when the end user presses the TAB key during an edit-in-place process. There are two types of actions that TabAction controls:

what to do with pending changes (default, save, abandon, or prompt),
what mode to use next (continue editing or revert to non-edit mode).

The specified actions are implemented by the Ask method. Set the actions by assigning, adding, or subtracting the following EQUATEd values to TabAction. The following EQUATEs are in ABBROWSE.INC:

```
      ITEMIZE,PRE(EIPAction)
Default   EQUATE(0)         !save according to the Ask method
Always    EQUATE(1)         !always save the changes
Never     EQUATE(2)         !never save the changes
Prompted  EQUATE(4)         !ask whether to save the changes
Remain    EQUATE(8)         !continue editing
      END
```

Example:

```
BRW1.TabAction = EIPAction:Prompted          !ask to save changes
BRW1.TabAction = EIPAction:Prompted+EIPAction:Remain  !ask to save, keep
editing
```

See Also: Ask

Toolbar (browse Toolbar object)

Toolbar &ToolbarClass

The **Toolbar** property is a reference to the ToolbarClass for this BrowseClass object. The ToolbarClass object collects toolbar events and passes them on to the active ToolbarTarget object for processing.

The AddToolbarTarget method registers a ToolbarTarget, such as a ToolbarListBoxClass object, as a potential target of a ToolbarClass object.

The ToolbarClass.SetTarget method sets the active target for a ToolbarClass object.

Implementation: The ToolbarClass object for a browse is the object that detects toolbar events, such as scroll down or page down, and passes them on to the *active* ToolbarListBoxClass (ToolbarTarget) object. In the standard template implementation, there is a single global toolbar, and a ToolbarClass object per procedure that may drive several different browses and forms, each of which is a ToolbarTarget. Only one ToolbarTarget is active at a time.

See Also: ToolbarItem, AddToolbarTarget, ToolbarClass.SetTarget

ToolbarItem (browse ToolbarTarget object)

ToolbarItem &ToolbarListBoxClass

The **ToolbarItem** property is a reference to the ToolbarListBoxClass for this BrowseClass object. The ToolbarListBoxClass (ToolbarTarget) object receives toolbar events (from a ToolbarClass object) and processes them.

The AddToolbarTarget method registers a ToolbarTarget, such as a ToolbarListBoxClass object, as a potential target of a ToolbarClass object.

The ToolbarClass.SetTarget method sets the active target for a ToolbarClass object.

Implementation: The ToolbarClass object for a browse is the object that detects toolbar events, such as scroll down or page down, and passes them on to the *active* ToolbarListBoxClass (ToolbarTarget) object. In the standard template implementation, there is a single global toolbar, and a ToolbarClass object per procedure that may drive several different browses and forms, each of which is a ToolbarTarget. Only one ToolbarTarget is active at a time.

See Also: Toolbar, AddToolbarTarget, ToolbarClass.SetTarget

ToolControl (browse toolbox control number)

ToolControl SIGNED

The **ToolControl** property contains the number of the browse's toolbox control. This is typically the value of the Toolbox BUTTON's field equate. The BrowseClass methods use this value to enable and disable the control when appropriate, to post events to the control, to map Toolbox behavior to corresponding popup menu choices, etc.

Implementation: The BrowseClass.Init method does not initialize the ToolControl property. You should initialize the ToolControl property after the BrowseClass.Init method is called. See the *Conceptual Example*.

See Also: UpdateToolbarButtons

ViewControl (view button)

ViewControl SIGNED

The **ViewControl** property contains the number (field equate) of the browse's view button control.

Window (WindowManager object)

Window &WindowManager

The **Window** property is a reference to the WindowManager object for this BrowseClass object. The WindowManager object forwards events to the active BrowseClass object for processing.

The WindowManager.AddItem method registers the BrowseClass object with the WindowManager object, so the WindowManager object can forward events.

The Init method sets the value of the Window property.

Implementation: The WindowManager object calls the BrowseClass.TakeEvent method so the BrowseClass object can handle the events as needed.

See Also: Init, WindowManager.AddItem

BrowseClass Methods

BrowseClass Methods

The BrowseClass inherits all the methods of the ViewManager from which it is derived. See *ViewManager Methods* for more information.

BrowseClass Functional Organization--Expected Use

As an aid to understanding the BrowseClass, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the BrowseClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the BrowseClass object
AddEditControl	specify custom edit-in-place for a browse field
AddField	identify corresponding FILE and QUEUE fields
AddLocator	associate a locator with its sort order
AddResetField	specify a field that refreshes the browse list
AddSortOrder	add a sort order to the browse list
AddToolbarTarget	associate the browse list with a toolbar object
SetAlertsv	alert keys for list, locator, and edit controls
Kill v	shut down the BrowseClass object

Mainstream Use:

Nextv	get the next view record in sequence
Previousv	get the previous view record in sequence
Ask	update the selected item
TakeEventv	process the current ACCEPT loop event
TakeNewSelectionv	process a new browse list item selection

v These methods are also Virtual.

Occasional Use:

ApplyRange	refresh browse list to specified range limit
AskRecord	edit-in-place the selected item
PostNewSelection	post an EVENT:NewSelection to the browse list
Records	return the number of records in the browse list
ResetResets	snapshot the current value of the Reset fields
ResetThumbLimits	reset thumb limits to match the result set
TakeAcceptedLocator	apply an entered locator value

UpdateResets	copy reset fields to file buffer
UpdateThumb	position the scrollbar thumb
UpdateThumbFixed	position the scrollbar fixed thumb
UpdateWindow v	apply pending scroll, locator, range, etc.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

ApplyRange	conditionally range limit and filter the records
Fetch	loads a page of items into the browse list
Kill	shut down the BrowseClass object
Next	get the next record from the browse view
Previous	get the previous record from the browse view
Reset	reset the view position
ResetFromAsk	reset browse object after update
ResetFromBuffer	refill queue based on current record buffer
ResetFromFile	refill queue based on FILE POSITION
ResetFromView	reset browse object to its result set
ResetQueue	fill or refill the browse queue
ScrollEnd	scroll to the first or last item
ScrollOne	scroll up or down one item
ScrollPage	scroll up or down one page of items
SetAlerts	alert keys for list, locator, and edit controls
SetQueueRecord	copy data from file buffer to queue buffer
SetSort	apply sort order to browse
ResetSort	apply sort order to browse
TakeKey	process an alerted keystroke
TakeEvent	process the current ACCEPT loop event
TakeNewSelection	process a new browse list item selection
TakeScroll	process a scroll event
TakeVCRScroll	process a VCR scroll event
UpdateBuffer	copy data from queue buffer to file buffer
UpdateViewRecord	copy selected item to corresponding file buffers
UpdateWindow	apply pending scroll, locator, range, etc.

Use ResetSort followed by UpdateWindow to refresh and redisplay your ABC BrowseBoxes. Or, use the WindowManager.Reset method.

AddEditControl (specify custom edit-in-place class)

AddEditControl([*editclass*]*, column* [*, autofree*] **)**

AddEditControl Specifies a custom edit-in-place class for a browse field.

editclass The label of the EditClass. If omitted, the specified *column* is not editable.

column An integer constant, variable, EQUATE, or expression that indicates the browse list column to edit with the specified *editclass* object. A value of one (1) indicates the first column; a two (2) indicates the second column, etc.

autofree A numeric constant, variable, EQUATE, or expression that indicates whether the BrowseClass.Kill method DISPOSEs of the *editclass* object. A zero (0) value leaves the object intact. A non-zero value DISPOSEs the object. If omitted, *autofree* defaults to zero (0).

The **AddEditControl** method specifies the *editclass* that defines the edit-in-place control for the browse *column*. Use *autofree* with caution; you should only DISPOSE of memory allocated with a NEW statement. See the *Language Reference* for more information on NEW and DISPOSE.

Implementation: You do not need to call this method to use the default *editclass*. If you do not call the AddEditControl method for a browse list column, the BrowseClass automatically instantiates the EditClass declared in ABBROWSE.INC for that column.

The *autofree* parameter defaults to zero (0). The BrowseClass.Kill method DISPOSEs the editclass objects only if *autofree* contains a non-zero value.

The BrowseClass.Ask method instantiates the *editclass* objects as needed, then creates and deletes the edit-in-place control upon the end user's insert or change request.

Example:

```
INCLUDE('ABBROWSE.INC')            !declare browse & related classes
INCLUDE('MYCOMBO.INC')             !declare custom Edit-in-place control class
!other browse class declarations
CODE
MyBrowse.AddEditControl(,1)        !column 1 not editable
MyBrowse.AddEditControl(ComboClass,2)   !edit column 2 with combo control
```

See Also: Ask

AddField (specify a FILE/QUEUE field pair)

AddField(*filefield, queuefield* **)**

AddField	Identifies the corresponding FILE and QUEUE fields for a browse list column.
filefield	The fully qualified label of the FILE field or memory variable. The *filefield* is the original source of the browse LIST's data.
queuefield	The fully qualified label of the corresponding QUEUE field. The *queuefield* is loaded from the *filefield*, and is the immediate source of the browse LIST's data.

The **AddField** method identifies the corresponding FILE and QUEUE fields for a browse list column. You must call AddField for each column displayed in the browse list.

You may also use the AddField method to pair memory variables with QUEUE fields by specifying a variable label as the *filefield* parameter.

Implementation: For browses with edit-in-place, you must add fields (call the AddField method) in the same sequence that you declare the browse QUEUE fields.

Example:

```
 INCLUDE('ABBROWSE.INC')                    !declare browse & related classes
States  FILE,DRIVER('TOPSPEED'),PRE(StFile) !declare States file
ByCode   KEY(StFile:Code),NOCASE,OPT
Record   RECORD,PRE()
Code      STRING(2)
Name      STRING(20)
         END
        END
StQType  QUEUE,TYPE                         !declare the St QUEUE type
Code      LIKE(StFile:Code)
Name      LIKE(StFile:Name)
Position  STRING(512)
         END
BrowseStClass CLASS(BrowseClass),TYPE       !declare the BrowseSt CLASS
Q              &StQType
              END
StQ      StQType                            !declare the (real) StQ QUEUE
BrowseSt BrowseStClass                      !declare the BrowseSt object
 CODE
 BrowseSt.AddField(StFile:Code,BrowseSt.Q.Code)   !pair up fields in
 BrowseSt.AddField(StFile:Name,BrowseSt.Q.Name)   !FILE & QUEUE
```

AddItem(program the BrowseClass object)

AddItem(*RecordProcessor*)

AddItem Adds specific functionality to the BrowseClass object.

RecordProcessor The label of a RecordProcessor interface.

The **AddItem** method registers an ABC Library interface with the BrowseClass object and adds the interface's specific functionality to the BrowseClass.

See Also: BrowseClass.Kill

AddLocator (specify a locator)

AddLocator(*locator* **)**

AddLocator Specifies a locator object for a specific sort order.

locator The label of the locator object.

The **AddLocator** method specifies a locator object for the sort order defined by the preceding call to the AddSortOrder or SetSort method. Typically, you call the AddLocator method immediately after the AddSortOrder method.

Implementation: The specified *locator* is sort order specific--it is enabled only when the associated sort order is active. The SetSort method applies or activates a sort order for the browse. Only one sort order is active at a time.

Example:

```
BrowseSt.AddSortOrder(BrowseSt:Step,StFile:ByCode)  !add sort order and
BrowseSt.AddLocator(BrowseSt:Locator)               !associated locator
BrowseSt:Locator.Init(?Loc,StFile:StCode,1,BrowseSt)!init locator object
```

See Also: AddSortOrder, LocatorClass, SetSort

AddResetField (set a field to monitor for changes)

AddResetField(*resetfield***)**

AddResetField Specifies a field that resets the browse list when the contents of the field changes.

resetfield The label of the field to monitor for changes.

For the active sort order (defined by the preceding call to the AddSortOrder or SetSort method), the **AddResetField** method specifies a field that the browse object monitors for changes, then, when the contents of the field changes, refreshes the browse list. Typically, you call the AddResetField method immediately after the AddSortOrder method.

You may call AddResetField multiple times to establish multiple reset fields for a sort order.

Implementation: The specified *resetfield* is sort order specific--it is enabled only when the associated sort order is active. The SetSort method sets the active sort order for the browse. SetSort also calls ApplyRange to monitor the reset fields for changes and SetSort resets the browse when a change occurs.

The WindowManager.Reset method also initiates an evaluation of the reset fields and a subsequent browse reset if needed for any browse objects registered with the WindowManager.

Example:

```
BrowseSt.AddSortOrder(BrowseSt:Step,StFile:ByCode) !add sort order
BrowseSt.AddLocator(BrowseSt:Locator)              !and associated locator
BrowseSt.AddResetField(Local:StFilter)             !and associated reset field
```

See Also: AddSortOrder, SetSort, WindowManager.Reset

AddSortOrder (specify a browse sort order)

AddSortOrder([*thumbstep*] [, *key*]**), PROC**

AddSortOrder Specifies an additional sort order for the browse list.

thumbstep The label of the StepClass object that controls vertical scroll bar and thumb behavior. If omitted, the vertical scroll bar exhibits Fixed Thumb behavior. See *Control Templates--BrowseBox* for more information on thumb behavior.

key The label of the KEY to sort by. If omitted, the browse list is not sorted--the items appear in physical order, or in the order specified by the inherited AppendOrder method.

The **AddSortOrder** method specifies an additional sort order for the browse list and returns the sort order's sequence number for use with the SetSort method. You must call the AddSortOrder method for each different sort order applied to the browse list.

The AddLocator method adds an associated locator for the sort order defined by the preceding call to AddSortOrder.

The AddResetField method adds an associated reset field for the sort order defined by the preceding call to AddSortOrder. You may add multiple reset fields for each sort order with multiple calls to AddResetField.

The inherited AddRange method adds an associated range limit for the sort order defined by the preceding call to AddSortOrder.

Implementation: The AddSortOrder method adds an entry at a time to the Sort property.

Return Data Type: BYTE

Example:

```
BrowseSt.AddSortOrder(BrowseSt:Step,StFile:ByCode) !add sort order
BrowseSt.AddLocator(BrowseSt:Locator)              !and associated locator
BrowseSt.AddResetField(Local:StFilter)             !and associated reset field
```

See Also: AddLocator, AddResetField, Sort, StepClass, SetSort, ViewManager.AddRange, ViewManager.AppendOrder

AddToolbarTarget (set the browse toolbar)

AddToolbarTarget(*toolbar* **)**

AddToolbarTarget Registers the browse list as a potential target of the specified *toolbar*.

toolbar The label of the ToolbarClass object that directs toolbar events to this BrowseClass object.

The **AddToolbarTarget** method registers the BrowseClass object as a potential target of the specified *toolbar*.

The ToolbarClass.SetTarget method sets the active target for a ToolbarClass object.

Implementation: The Toolbar object for a browse is the object that detects toolbar events, such as scroll down or page down, and passes them on to the *active* ToolbarTarget object. In the standard template implementation, there is a single global toolbar, and a Toolbar object per procedure that may drive several different browses and forms, each of which is a ToolbarTarget. Only one ToolbarTarget is active at a time.

Example:

```
BrowseSt.AddToolbarTarget(Browse:Toolbar)  !tie BrowseSt object to Toolbar object
BrowseZIP.AddToolbarTarget(Browse:Toolbar) !tie BrowseZIP object to Toolbar object
!program code
Browse:Toolbar.SetTarget(?StList)          !state list is current toolbar target
!program code
Browse:Toolbar.SetTarget(?ZIPList)         !ZIP list is current toolbar target
```

See Also: Toolbar, ToolbarItem, ToolbarClass.SetTarget

ApplyRange (refresh browse based on resets and range limits)

ApplyRange, VIRTUAL, PROC

The **ApplyRange** method checks the current status of reset fields and range limits and refreshes the browse list if necessary. Then it returns a value indicating whether a screen redraw is required.

The inherited AddRange method adds an associated range limit for each sort order. The AddResetField method establishes reset fields for each browse sort order.

Implementation: The ApplyRange method returns one (1) if a screen redraw is required or zero (0) if no redraw is required.

Return Data Type: BYTE

Example:

```
IF BrowseSt.ApplyRange()      !refresh browse queue if things changed
 DISPLAY(?StList)             !redraw LIST if queue refreshed
END
```

See Also: AddResetField, ViewManager.AddRange

Ask (update selected browse item)

Ask(*request* **), VIRTUAL, PROC**

Ask	Updates the selected browse record.
request	A numeric constant, variable, EQUATE, or expression that indicates the requested update action. Valid actions are Insert, Change, and Delete.

The **Ask** method updates the selected browse record and returns a value indicating whether the requested update was completed or cancelled.

Implementation: Depending on the value of the AskProcedure property, the Ask method either calls the WindowManager.Run method to execute a specific update procedure, or it calls the AskRecord method to do an edit-in-place update.

The TakeEvent method calls the Ask method. The Ask method assumes the UpdateViewRecord method has been called to ensure correct record buffer contents.

Return value EQUATEs are declared in \LIBSRC\TPLEQU.CLW:

```
RequestCompleted   EQUATE (1)     !Update Completed
RequestCancelled   EQUATE (2)     !Update Aborted
```

EQUATEs for *request* are declared in \LIBSRC\TPLEQU.CLW:

```
InsertRecord     EQUATE (1)     !Add a record to table
ChangeRecord     EQUATE (2)     !Change the current record
DeleteRecord     EQUATE (3)     !Delete the current record
```

Return Data Type: BYTE

Example:

```
BrowseClass.TakeEvent PROCEDURE
!procedure data
  CODE
 !procedure code
 CASE ACCEPTED()
 OF SELF.DeleteControl
  SELF.Window.Update()
  SELF.Ask(DeleteRecord)           !delete a browse item
 OF SELF.ChangeControl
  SELF.Window.Update()
  SELF.Ask(ChangeRecord)           !change a browse item
 OF SELF.InsertControl
  SELF.Window.Update()
  SELF.Ask(InsertRecord)           !insert a browse item
```

```
OF SELF.SelectControl
 SELF.Window.Response = RequestCompleted
 POST(EVENT:CloseWindow)
ELSE
 SELF.TakeAcceptedLocator
END
```

See Also: AskProcedure, AskRecord, TakeEvent

AskRecord (edit-in-place selected browse item)

AskRecord(*request* **), VIRTUAL, PROC**

AskRecord	Does edit-in-place update of the selected browse record.
request	A numeric constant, variable, EQUATE, or expression that indicates the requested edit-in-place action. Valid edit-in-place actions are Insert, Change, and Delete.

The **AskRecord** method does edit-in-place updates for the selected browse row and column, then returns a value indicating whether the requested edit was completed or cancelled. The AddEditControl method specifies a custom EditClass for a specific browse column.

Implementation: The AskRecord method assumes the UpdateViewRecord method has been called to ensure correct record buffer contents. AskRecord should be followed by the ResetFromAsk method. The Ask method calls the AskRecord method.

Return value EQUATEs are declared in \LIBSRC\TPLEQU.CLW:

```
RequestCompleted   EQUATE (1)     !Update Completed
RequestCancelled   EQUATE (2)     !Update Aborted
```

EQUATEs for *request* are declared in \LIBSRC\TPLEQU.CLW:

```
InsertRecord     EQUATE (1)     !Add a record to table
ChangeRecord     EQUATE (2)     !Change the current record
DeleteRecord     EQUATE (3)     !Delete the current record
```

Return Data Type: BYTE

Example:

```
BrowseClass.Ask PROCEDURE(BYTE Req)
Response BYTE
  CODE
  LOOP
    SELF.Window.VCRRequest = VCR:None
    IF Req=InsertRecord THEN
      SELF.PrimeRecord
    END
    IF SELF.AskProcedure
      Response = SELF.Window.Run(SELF.AskProcedure,Req)   !do edit-in-place update
      SELF.ResetFromAsk(Req,Response)
    ELSE
      Response = SELF.AskRecord(Req)
    END
  UNTIL SELF.Window.VCRRequest = VCR:None
  RETURN Response
```

See Also: AddEditControl, Ask, ResetFromAsk

Fetch (get a page of browse items)

Fetch(*direction* **), VIRTUAL, PROTECTED**

Fetch	Loads a page of items into the browse list queue.
direction	A numeric constant, variable, EQUATE, or expression that indicates whether to get the next set of items or the previous set of items.

The **Fetch** method loads the next or previous page of items into the browse list queue.

Implementation: Fetch is called by the ResetQueue, ScrollOne, ScrollPage, and ScrollEnd methods. A page of items is as many items as fits in the LIST control.

BrowseClass.Fetch *direction* value EQUATEs are declared in ABBROWSE.INC as follows:

```
FillBackward   EQUATE(1)
FillForward    EQUATE(2)
```

Example:

```
ScrollOne PROCEDURE(SIGNED Event)
 CODE
  IF Event = Event:ScrollUp AND CurrentChoice > 1
    CurrentChoice -= 1
  ELSIF Event = Event:ScrollDown AND CurrentChoice < RECORDS(ListQueue)
    CurrentChoice += 1
  ELSE
    ItemsToFill = 1
    MyBrowse.Fetch( CHOOSE( Event = EVENT:ScrollUp, FillForward, FillBackward ))
  END
```

See Also: ResetQueue, ScrollOne, ScrollPage, ScrollEnd

Init(initialize the BrowseClass object)

Init(|*listcontrol*, *viewposition*, *view*, *listqueue*, *relationmanager*, *windowmanager* |)

|*ilistcontrol*, *view*, *browsequeue*, *relationmanager*, *windowmanager* |

Init	Initializes the BrowseClass object.
listcontrol	A numeric constant, variable, EQUATE, or expression containing the control number of the browse's LIST control.
ilistcontrol	A reference to an IListControl interface.
viewposition	The label of a string field within the listqueue containing the POSITION of the view.
view	The label of the browse's underlying VIEW.
listqueue	The label of the listcontrol's data source QUEUE.
browsequeue	A reference to a BrowseQueue interface.
relationmanager	The label of the browse's primary file RelationManager object. See Relation Manager for more information.
windowmanager	The label of the browse's WindowManager object. See Window Manager for more information.

The **Init** method initializes the BrowseClass object.

Init(*listcontrol*, *viewposition*, *view*, *listqueue*, *relationmanager*, *windowmanager*)
Initializes the BrowseClass object using the Standard Behaviour interface. For more information see the StandardBehaviour section.

Init(*ilistcontrol*, *view*, *browsequeue*, *relationmanager*, *windowmanager*)
Initializes the BrowseClass object without the Standard Behaviour interface. The Init method calls the PARENT.Init (ViewManager.Init) method to initialize the browse's ViewManager object. See View Manager for more information. The Init method instantiates a PopupClass object for the browse. The Init method calls the WindowManager.AddItem method to register its presence with the WindowManager.

Example:

```
CODE                                !Setup the BrowseClass object:
BrowseState.Init(?StateList,|       ! identify its LIST control,
     StateQ.Position,       |       ! its VIEW position string,
     StateView,             |       ! its source/target VIEW,
     StateQ,                |       ! the LIST's source QUEUE,
     Relate:State           |       ! the primary file RelationManager
     ThisWindow)                    ! the WindowManager
```

See Also: ViewManager.Init, PopupClass, WindowManager.AddItem, StandardBehavior Interface

InitSort (initialize locator values)

InitSort (*neworder***), VIRTUAL**

The **InitSort** method initializes locator values when a new sort order is applied to a browse list.

See Also: SetSort

Kill (shut down the BrowseClass object)

Kill, VIRTUAL

The **Kill** method shuts down the BrowseClass object.

Implementation: Among other things, the BrowseClass.Kill method calls the PARENT.Kill (ViewManager.Kill) method to shut down the browse's ViewManager object. See *View Manager* for more information.

Example:

```
CODE                                    !Setup the BrowseClass object:
BrowseState.Init(?StateList,|           ! identify its LIST control,
         StateQ.Position,   |           ! its VIEW position string,
         StateView,         |           ! its source/target VIEW,
         StateQ,            |           ! the LIST's source QUEUE,
         Relate:State       |           ! the primary file RelationManager
         ThisWindow)                    ! the WindowManager

!program code

BrowseState.Kill                        !shut down the BrowseClass object
```

See Also: ViewManager.Kill

Next (get the next browse item)

Next, VIRTUAL

The **Next** method gets the next record from the browse view and returns a value indicating its success or failure.

Next returns Level:Benign if successful, Level:Notify if it reached the end of the file, and Level:Fatal if it encountered a fatal error.

Implementation: Corresponding return value EQUATEs are declared in ABERROR.INC. See *Error Class* for more information on these severity level EQUATEs.

```
Level:Benign                EQUATE(0)
Level:User                  EQUATE(1)
Level:Program               EQUATE(2)
Level:Fatal                 EQUATE(3)
Level:Cancel                EQUATE(4)
Level:Notify                EQUATE(5)
```

The Next method is called by the Fetch and ResetThumbLimits(PRIVATE) methods. Among other things, Next calls the PARENT.Next (ViewManager.Next) method. See *ViewManager* for more information.

Return Data Type: BYTE

Example:

```
CASE MyBrowse.Next()       !get next record
OF Level:Benign            !if successful, continue
OF Level:Fatal             !if fatal error
 RETURN                    ! end this procedure
OF Level:Notify            !if end of file reached
 MESSAGE('Reached end of file.')  ! acknowledge EOF
END
```

See Also: Fetch

NotifyUpdateError (throw error on update)

NotifyUpdateError( ), BYTE, VIRTUAL

The **NotifyUpdateError** method returns an error code to the active ErrorManager when an attempted update to refresh a record has failed.

Implementation: The NotifyUpdateError is called from the BrowseClass UpdateViewRecord method, which is used to retrieve the VIEW record that corresponds to a chosen listbox record.

Return Data Type: BYTE

Example:

```
IF SELF.ListQueue.Records()
   SELF.CurrentChoice = SELF.ILC.Choice()
   SELF.ListQueue.Fetch(SELF.CurrentChoice)
   WATCH(SELF.View)
   REGET(SELF.View,SELF.ListQueue.GetViewPosition())

   RC = ERRORCODE()

   IF  RC = NoDriverSupport
     Pos = POSITION (SELF.View)
     RESET(SELF.View,SELF.ListQueue.GetViewPosition())
     WATCH(SELF.View)
     NEXT(SELF.View)
     RC = ERRORCODE()
     RESET(SELF.View,Pos)
   END
   IF  RC <> 0
     SELF.NeedRefresh = SELF.NotifyUpdateError()
   END
 END
```

See Also: UpdateViewRecord

PostNewSelection (post an EVENT:NewSelection to the browse list)

PostNewSelection

The **PostNewSelection** method posts an EVENT:NewSelection to the browse list to support scrolling, inserts, deletes, and other changes of position within the browse list.

Implementation: Event EQUATEs are declared in EQUATES.CLW.

Example:

```
UpdateMyBrowse ROUTINE
 !update code
 MyBrowse.ResetFromFile          !after insert or change, reload Q from file
 MyBrowse.PostNewSelection       !after update, post a new selection event
                                 !so window gets properly refreshed
```

Previous (get the previous browse item)

Previous, VIRTUAL

The **Previous** method gets the previous record from the browse view and returns a value indicating its success or failure.

Implementation: Returns Level:Benign if successful, Level:Notify if it reached the end of the file, and Level:Fatal if it encountered a fatal error. Corresponding severity level EQUATEs are declared in ABERROR.INC. See *Error Class* for more information on error severity levels.

```
Level:Benign                EQUATE(0)
Level:User                  EQUATE(1)
Level:Program               EQUATE(2)
Level:Fatal                 EQUATE(3)
Level:Cancel                EQUATE(4)
Level:Notify                EQUATE(5)
```

The Previous method is called by the Fetch and ResetThumbLimits methods. Among other things, Previous calls the PARENT.Previous (ViewManager.Previous) method. See *ViewManager* for more information.

Return Data Type: BYTE

Example:

```
CASE MyBrowse.Previous()        !get previous record
OF Level:Benign                 !if successful, continue
OF Level:Fatal                  !if fatal error
 RETURN                         ! end this procedure
OF Level:Notify                 !if end of file reached
 MESSAGE('Reached end of file.')! acknowledge EOF
END
```

See Also: Fetch

Records (return the number of browse queue items)

Records, PROC

The **Records** method returns the number of records in the browse list queue *and* disables appropriate controls if the record count is zero.

Return Data Type: LONG

Example:

```
DeleteMyBrowse ROUTINE
 !delete code
 MyBrowse.Records()           !disable delete button (and menu) if no items
```

ResetFields(reinitialize FieldPairsClass)

ResetFields

The **ResetFields** method reinitializes the FieldPairs recognized by the FieldPairsClass.

Implementation: The ResetFields method reinitializes the FieldPairs by first disposing the FieldsPairsClass and then initializing the FieldPairsClass.

See Also: FieldPairsClass.Init , FieldPairsClass.Kill

ResetFromAsk (reset browse after update)

ResetFromAsk(*request, response* **), VIRTUAL, PROTECTED**

ResetFromAsk Resets the BrowseClass object following an update.

request A BYTE variable or value that indicates the type of update requested. Valid updates are insert (1), change (2), and delete (3).

response A BYTE variable or value that indicates whether the requested update was completed (1) or cancelled (2).

The **ResetFromAsk** method resets the BrowseClass object following an Ask or AskRecord update to a browse item.

Implementation: The Ask and AskRecord methods call ResetFromAsk as needed to reset the BrowseClass object.

ResetFromAsk FLUSHes the BrowseClass object's VIEW if needed, calls the appropriate "reset" method (ResetQueue, ResetFromFile, or ResetFromView) to refill the QUEUE, then carries out any pending scroll request made concurrently with the update. See *WindowManager.VCRRequest*.

EQUATEs for the *request* parameter are declared in \LIBSRC\TPLEQU.CLW as follows:

```
InsertRecord  EQUATE (1)  !Add a record to table
ChangeRecord  EQUATE (2)  !Change the current record
DeleteRecord  EQUATE (3)  !Delete the current record
```

EQUATEs for the *response* parameter are declared in \LIBSRC\TPLEQU.CLW as follows:

```
RequestCompleted  EQUATE (1)  !Update Completed
RequestCancelled  EQUATE (2)  !Update Aborted
```

Example:

```
BrowseClass.Ask PROCEDURE(BYTE Req)
Response BYTE
  CODE
  LOOP
    SELF.Window.VCRRequest = VCR:None
    IF Req=InsertRecord THEN
      SELF.PrimeRecord
    END
    IF SELF.AskProcedure
      Response = SELF.Window.Run(SELF.AskProcedure,Req)
      SELF.ResetFromAsk(Req,Response)          !reset the browse after update
    ELSE
      Response = SELF.AskRecord(Req)
    END
  UNTIL SELF.Window.VCRRequest = VCR:None
  RETURN Response
```

See Also: Ask, AskRecord, ResetQueue, ResetFromFile, ResetFromView, WindowManager.VCRRequest

ResetFromBuffer (fill queue starting from record buffer)

ResetFromBuffer, VIRTUAL

The **ResetFromBuffer** method fills or refills the browse queue starting from the record in the primary file buffer (and secondary file buffers if applicable). If the record is found, ResetFromBuffer fills the browse queue starting from that record. If the record is not found, ResetFromBuffer fills the browse queue starting from the nearest matching record.

If the active sort order (key) allows duplicates and duplicate matches exist, ResetFromBuffer fills the browse queue starting from the *first* matching record.

Tip: Use ResetFromBuffer when the primary and secondary file positions and values are valid, but the result set may no longer match the buffer values. For example, after a locator or scrollbar thumb move.

Implementation: ResetFromBuffer succeeds even if there is no exactly matching record and is typically used to locate the appropriate record after a thumb movement.

ResetFromBuffer calls the ViewManager.Reset method for positioning, then calls the ResetQueue method to fill the browse queue.

Example:

```
 IF EVENT() = EVENT:ScrollDrag         !if thumb moved
  IF ?MyList{PROP:VScrollPos} <= 1     !handle scroll to top
   POST(Event:ScrollTop, ?MyList)
  ELSIF ?MyList{PROP:VScrollPos} = 100 !handle scroll to bottom
   POST(Event:ScrollBottom, ?MyList)
  ELSE                      !handle intermediate scroll
   MyBrowse.Sort.FreeElement =
MyBrowse.Sort.Step.GetValue(?MyList{PROP:VScrollPos})
   MyBrowse.ResetFromBuffer            !and reload the queue from that point
  END
 END
```

See Also: ViewManager.Reset, ResetQueue

ResetFromFile (fill queue starting from file POSITION)

ResetFromFile, VIRTUAL

The **ResetFromFile** method fills or refills the browse queue starting from the current POSITION of the primary file. If no POSITION has been established, ResetFromFile fills the browse queue starting from the beginning of the file.

Tip: Use ResetFromFile when the primary file position is valid but secondary records and their contents may not be. For example, when returning from an update.

Implementation: ResetFromFile succeeds even if the record buffer is cleared and is typically used to get the current record after an update.

Example:

```
MyBrowseClass.ResetFromAsk PROCEDURE(*BYTE Request,*BYTE Response)
  CODE
  IF Response = RequestCompleted
    FLUSH(SELF.View)
    IF Request = DeleteRecord
      DELETE(SELF.ListQueue)
      SELF.ResetQueue(Reset:Queue) !refill queue after delete
    ELSE
      SELF.ResetFromFile           !refill queue after insert or change
    END
  ELSE
    SELF.ResetQueue(Reset:Queue)
  END
```

ResetFromView (reset browse from current result set)

ResetFromView, VIRTUAL

The **ResetFromView** method resets the BrowseClass object to conform to the current result set.

Tip: Use ResetFromView when you want to reset for any changes that may have happened to the entire record set, such as new records added or deleted by other workstations.

Implementation: The SetSort method calls the ResetFromView method.

The ResetFromView method readjusts the scrollbar thumb if necessary. The ABC Templates override the BrowseClass.ResetFromView method to recalculate totals if needed.

Example:

```
BRW1.ResetFromView PROCEDURE
ForceRefresh:Cnt  LONG
 CODE
 SETCURSOR(Cursor:Wait)
 SELF.Reset
 LOOP
  CASE SELF.Next()
  OF Level:Notify
   BREAK
  OF Level:Fatal
   RETURN
  END
  SELF.SetQueueRecord
  ForceRefresh:Cnt += 1
 END
 ForceRefresh = ForceRefresh:Cnt
 SETCURSOR()
```

ResetQueue (fill or refill queue)

ResetQueue(*resetmode* **), VIRTUAL**

ResetQueue Fills or refills the browse queue.

resetmode A numeric constant, variable, EQUATE, or expression that determines how ResetQueue determines the highlighted record after the reset. A value of Reset:Queue highlights the currently selected item. A value of Reset:Done highlights a record based on the view's current position and other factors, such as the RetainRow property.

The **ResetQueue** method fills or refills the browse queue and appropriately enables or disables Change, Delete, and Select controls. The refill process depends on the value of the *resetmode* parameter and several other BrowseClass properties, including ActiveInvisible, AllowUnfilled, RetainRow, etc.

A *resetmode* value of Reset:Queue usually produces a more efficient queue refill than Reset:Done.

Implementation: ResetQueue calls the Fetch method to fill the queue.

The *resetmode* EQUATEs are declared in ABBROWSE.INC as follows:

```
   ITEMIZE,PRE(Reset)
Queue  EQUATE
Done  EQUATE
   END
```

Example:

```
DeleteMyBrowse ROUTINE
 !delete code
 MyBrowse.ResetQueue(Reset:Queue) !after delete, refresh Q
 MyBrowse.PostNewSelection        !after delete, post a new selection event
                                  !so window gets properly refreshed
```

See Also: ActiveInvisible, AllowUnfilled, RetainRow, ChangeControl, DeleteControl, SelectControl, Fetch

ResetResets (copy the Reset fields)

ResetResets, PROTECTED

The **ResetResets** method copies the current values of the Reset fields so any subsequent changes in their contents can be detected.

The AddResetField method adds an associated reset field for the sort order defined by the preceding call to AddSortOrder. You may add multiple reset fields for each sort order with multiple calls to AddResetField.

Example:

```
MyBrowse.CheckReset  PROCEDURE
 IF NOT SELF.Sort.Resets.Equal()  !if reset fields changed,
  SELF.ResetQueue(Reset:Queue)    !refresh Q
  SELF.ResetResets                !take a new copy of the reset field values
 END
```

See Also: AddResetField

ResetSort (apply sort order to browse)

ResetSort(*force* **), VIRTUAL, PROC**

ResetSort	Reapplies the active sort order to the browse list.
force	A numeric constant, variable, EQUATE, or expression that indicates whether to reset the browse conditionally or unconditionally. A value of one (1 or True) unconditionally resets the browse; a value of zero (0 or False) only resets the brose as circumstances require (sort order changed, reset fields changed, first loading, etc.).

The **ResetSort** method reapplies the active sort order to the browse list and returns one (1) if the sort order changed; it returns zero (0) if the order did not change. Any range limits, locators, or reset fields associated with the sort order are enabled.

Tip: Use ResetSort followed by UpdateWindow to refresh and redisplay your ABC BrowseBoxes. Or, use the WindowManager.Reset method.

Implementation: The ResetSort method calls the SetSort method to applt the current sort order. The ABC Templates override the ResetSort method to apply the sort order based on the selected tab.

Return Data Type: BYTE

Example:

```
BRW1.ResetSort FUNCTION(BYTE Force)   !apply appropriate sort order

 CODE
 IF CHOICE(?CurrentTab) = 1           !If 1st tab selected
  RETURN SELF.SetSort(1,Force)        !apply first sort order
 ELSE                                 !otherwise
  RETURN SELF.SetSort(2,Force)        !apply second sort order
 END
```

See Also: AddRange, AddResetField, AddSortOrder, Set Sort ,UpdateWindow

ScrollEnd (scroll to first or last item)

ScrollEnd(*scrollevent* **), VIRTUAL, PROTECTED**

ScrollEnd	Scrolls to the first or last browse list item.
scrollevent	A numeric constant, variable, EQUATE, or expression that indicates the requested scroll action. Valid scroll actions for this method are scrolls to the top or bottom of the list.

The **ScrollEnd** method scrolls to the first or last browse list item.

Implementation: The BrowseClass.TakeScroll method calls the ScrollEnd method.

A hexadecimal *scrollevent* value of EVENT:ScrollTop scrolls to the first list item. A value of EVENT:ScrollBottom scrolls to the last list item. Corresponding scroll event EQUATEs are declared in EQUATES.CLW:

```
EVENT:ScrollTop     EQUATE (07H)
EVENT:ScrollBottom  EQUATE (08H)
```

Example:

```
BrowseClass.TakeScroll PROCEDURE( SIGNED Event )
 CODE
 IF RECORDS(SELF.ListQueue)
  CASE Event
  OF Event:ScrollUp OROF Event:ScrollDown
   SELF.ScrollOne( Event )
  OF Event:PageUp OROF Event:PageDown
   SELF.ScrollPage( Event )
  OF Event:ScrollTop OROF Event:ScrollBottom
   SELF.ScrollEnd( Event )
  END
 END
```

See Also: TakeScroll

ScrollOne (scroll up or down one item)

ScrollOne(*scrollevent* **), VIRTUAL, PROTECTED**

ScrollOne	Scrolls up or down one browse list item.
scrollevent	A numeric constant, variable, EQUATE, or expression that indicates the requested scroll action. Valid scroll actions for this method are scrolls up or down a single list item.

The **ScrollOne** method scrolls up or down one browse list item.

Implementation: The BrowseClass.TakeScroll method calls the ScrollOne method.

A hexadecimal *scrollevent* value of EVENT:ScrollUp scrolls up one list item. A value of EVENT:ScrollDown scrolls down one list item. Corresponding scroll event EQUATEs are declared in EQUATES.CLW:

```
EVENT:ScrollUp      EQUATE (03H)
EVENT:ScrollDown    EQUATE (04H)
```

Example:

```
BrowseClass.TakeScroll PROCEDURE( SIGNED Event )
 CODE
 IF RECORDS(SELF.ListQueue)
  CASE Event
  OF Event:ScrollUp OROF Event:ScrollDown
   SELF.ScrollOne( Event )
  OF Event:PageUp OROF Event:PageDown
   SELF.ScrollPage( Event )
  OF Event:ScrollTop OROF Event:ScrollBottom
   SELF.ScrollEnd( Event )
  END
 END
```

See Also: TakeScroll

ScrollPage (scroll up or down one page)

ScrollPage(*scrollevent* **), VIRTUAL, PROTECTED**

ScrollPage	Scrolls up or down one page of browse list items.
scrollevent	A numeric constant, variable, EQUATE, or expression that indicates the requested scroll action. Valid scroll actions for this method are scrolls up one page or down one page of browse list items.

The **ScrollPage** method scrolls up or down one page of browse list items.

Implementation: The BrowseClass.TakeScroll method calls the ScrollPage method.

A hexadecimal *scrollevent* value of EVENT:PageUp scrolls up one page of browse list items. A value of EVENT:PageDown scrolls down one page of browse list items. Corresponding scroll event EQUATEs are declared in EQUATES.CLW:

```
EVENT:PageUp         EQUATE (05H)
EVENT:PageDown       EQUATE (06H)
```

Example:

```
BrowseClass.TakeScroll PROCEDURE( SIGNED Event )
 CODE
 IF RECORDS(SELF.ListQueue)
  CASE Event
  OF Event:ScrollUp OROF Event:ScrollDown
   SELF.ScrollOne( Event )
  OF Event:PageUp OROF Event:PageDown
   SELF.ScrollPage( Event )
  OF Event:ScrollTop OROF Event:ScrollBottom
   SELF.ScrollEnd( Event )
  END
 END
```

See Also: TakeScroll

SetAlerts (alert keystrokes for list and locator controls)

SetAlerts, VIRTUAL

The **SetAlerts** method alerts standard keystrokes for the browse's list control and for any associated locator controls.

The BrowseClass.TakeKey method processes the alerted keystrokes.

Implementation: The BrowseClass.SetAlerts method alerts the mouse DOUBLE-CLICK, the INSERT, DELETE and CTRL+ENTER keys for the browse's list control and calls the LocaorClass.SetAlerts method for each associated locator control. Corresponding keycode EQUATEs are declared in KEYCODES.CLW.

The BrowseClass.SetAlerts method also sets up a popup menu for the browse list that mimics the behavior of any control buttons (insert, change, delete, select).

Example:

```
PrepareStateBrowse ROUTINE              !Setup the BrowseClass object:
 BrowseState.Init(?StateList,|          ! identify its LIST control,
          StateQ.Position,   |          ! its VIEW position string,
          StateView,         |          ! its source/target VIEW,
          StateQ,            |          ! the LIST's source QUEUE,
          Relate:State)                 ! and primary file RelationManager
 BrowseState.SetAlerts                  !alert LIST and locator keystrokes
```

See Also: TakeKey

SetLocatorField (set sort free element to passed field)

SetLocatorField (*free*), VIRTUAL

SetLocatorField	Sets the sort free element to the passed field.
free	An ANY data type, passed by address, that contains the free element that will be used as the locator field.

The **SetLocatorField** method sets the specified locator sort to the browse list. The free element represents a potential sort that has modified the default sort in the browse list. That element now can become the active locator.

Implementation: The BrowseClass.SetLocatorFromSort call the SetLocatorField method.

SetLocatorFromSort (use sort like locator field)

SetLocatorFromSort (*free*), VIRTUAL

SetLocatorFromSort	Applies a specified locator to the browse list.

The **SetLocatorFromSort** method uses the first field of the sort as the locator field if there is a sort order active.

Implementation: None

SetQueueRecord (copy data from file buffer to queue buffer:BrowseClass)

SetQueueRecord, VIRTUAL

The **SetQueueRecord** method copies corresponding data from the *filefield* fields to the *queuefield* fields specified by the AddField method. Typically these are the file buffer fields and the browse list's queue buffer fields so that the queue buffer matches the file buffers.

Implementation: The BrowseClass.Fetch and BrowseClass.Ask methods call the SetQueueRecord method.

Example:

```
MyBrowseClass.SetQueueRecord PROCEDURE
 CODE
 SELF.Fields.AssignLeftToRight            !copy data from file to q buffer
 SELF.ViewPosition = POSITION( SELF.View )!set the view position
 !your custom code here
```

See Also: Ask, AddField, Fetch

SetSort (apply a sort order to the browse)

SetSort(*order*, *force reset* **), VIRTUAL, PROC**

SetSort	Applies a specified sort order to the browse list.
order	An integer constant, variable, EQUATE, or expression that specifies the sort order to apply.
force reset	A numeric constant, variable, EQUATE, or expression that tells the method whether to reset the browse conditionally or unconditionally. A value of zero (0 or False) resets the browse only if circumstances require (sort order changed, reset fields changed, first time loading); a value of one (1 or True) unconditionally resets the browse.

The **SetSort** method applies the specified sort *order* to the browse list and returns one (1) if the sort order changed; it returns zero (0) if the sort order did not change. Any range limits, locators, and reset fields associated with the sort order are enabled and applied.

The *order* value is typically a value returned by the AddSortOrder method which identifies the particular sort order. Since AddSortOrder returns sequence numbers, a value of one (1) applies the sort order specified by the first call to AddSortOrder; two (2) applies the sort order specified by the next call to AddSortOrder; etc. A value of zero (0) applies the default sort order.

Implementation: The ResetSort method calls the SetSort method.

Return Data Type: BYTE

Example:

```
IF FIELD() = ?FirstTab            !if first tab selected
 IF MyBrowse.SetSort(1,0)         !apply the first sort order
  MyBrowse.ResetThumbLimits       !if sort changed, reset thumb limits
 END
 MyBrowse.UpdateBuffer            !update file buffer from selected item
END
```

See Also: AddRange, AddResetField, AddSortOrder, ResetSort

TakeAcceptedLocator (apply an accepted locator value)

TakeAcceptedLocator, VIRTUAL

The **TakeAcceptedLocator** method applies an accepted locator value to the browse list--the BrowseClass object scrolls the list to the requested item.

Locators with entry controls are the only locators whose values are accepted. Other types of locators are invoked in other ways, for example, with alerted keys. Locator values are accepted whenthe end user TABS off or otherwise switches focus away from the locator's entry control.

The AddLocator method establishes locators for the browse.

Implementation: The TakeAcceptedLocator method calls the appropriate LocatorClass.TakeAccepted method.

Example:

```
IF FIELD() = ?MyLocator              !focus on locator field
 IF EVENT() = EVENT:Accepted         !if accepted
  MyBrowse.TakeAcceptedLocator       !BrowseClass object handles it
 END
END
```

See Also: AddLocator

TakeEvent (process the current ACCEPT loop event:BrowseClass)

TakeEvent, VIRTUAL

The **TakeEvent** method processes the current ACCEPT loop event for the BrowseClass object. The TakeEvent method handles all events associated with the browse list except a new selection event. The TakeNewSelection method handles new selection events for the browse.

Implementation: The WindowManager.TakeEvent method calls the TakeEvent method. The TakeEvent method calls the TakeScroll or TakeKey method as appropriate.

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 !procedure code
 LOOP I = 1 TO RECORDS(SELF.Browses)
  GET(SELF.Browses,I)
  SELF.Browses.Browse.TakeEvent
 END
 LOOP i=1 TO RECORDS(SELF.FileDrops)
  GET(SELF.FileDrops,i)
  ASSERT(~ERRORCODE())
  SELF.FileDrops.FileDrop.TakeEvent
 END
 RETURN RVal
```

See Also: TakeKey, TakeNewSelection, TakeScroll, WindowManager.TakeEvent

TakeKey (process an alerted keystroke:BrowseClass)

TakeKey, VIRTUAL, PROC

The **TakeKey** method processes an alerted keystroke for the BrowseClass object, including DOUBLE-CLICK, INSERT, CTRLENTER, or DELETE, and returns a value indicating whether any action was taken.

Implementation: TakeKey returns one (1) if any action is taken, otherwise it returns zero (0).

The TakeEvent method calls the TakeKey method as appropriate. The BrowseClass.TakeKey method calls the Locator.TakeKey method as appropriate.

Return Data Type: BYTE

Example:

```
IF FIELD() = ?MyBrowseList       !focus on browse list
 IF EVENT() EVENT:AlertKey       !if alerted keystroke
  MyBrowse.TakeKey               !BrowseClass object handles it
 END
END
```

See Also: TakeEvent

TakeNewSelection (process a new selection:BrowseClass)

TakeNewSelection, VIRTUAL, PROC

The **TakeNewSelection** method processes a new browse list item selection and returns a value indicating whether a window redraw is needed.

Implementation: TakeNewSelection returns one (1) if a window redraw is needed, otherwise it returns zero (0).

The TakeEvent method calls the TakeNewSelection method when appropriate. The BrowseClass.TakeNewSelection method calls the appropriate Locator.TakeNewSelection method.

Return Data Type: BYTE

Example:

```
IF FIELD() = ?MyBrowse                !focus on browse list
 IF EVENT() = EVENT:NewSelection      !if new selection
  MyBrowse.TakeNewSelection()         !BrowseClass object handles it
 ELSE                                 !if other event
  MyBrowse.TakeEvent                  !BrowseClass object handles it
 END
END
```

TakeScroll (process a scroll event)

TakeScroll([*scrollevent*] **), VIRTUAL**

TakeScroll Processes a scroll event for the browse list.

scrollevent An integer constant, variable, EQUATE, or expression that specifies the scroll event. Valid scroll events are up one item, down one item, up one page, down one page, up to the first item, and down to the last item. If omitted, no scrolling occurs.

The **TakeScroll** method processes a scroll event for the browse list.

Implementation: A *scrollevent* value of EVENT:ScrollUp scrolls up one item; EVENT:ScrollDown scrolls down one item; EVENT:PageUp scrolls up one page; EVENT:PageDown scrolls down one page; EVENT:ScrollTop scrolls to the first list item; EVENT:ScrollBottom scrolls to the last list item. Corresponding *scrollevent* EQUATEs are declared in EQUATES.CLW.

```
EVENT:ScrollUp      EQUATE (03H)
EVENT:ScrollDown    EQUATE (04H)
EVENT:PageUp        EQUATE (05H)
EVENT:PageDown      EQUATE (06H)
EVENT:ScrollTop     EQUATE (07H)
EVENT:ScrollBottom  EQUATE (08H)
```

The TakeScroll method calls the ScrollEnd, ScrollOne, or ScrollPage method as needed.

Example:

```
IF FIELD() = ?MyBrowse                !focus on browse list
 CASE EVENT()                         !scroll event
 OF EVENT:ScrollUp
 OROF EVENT:ScrollDown
 OROF EVENT:PageUp
 OROF EVENT:PageDown
 OROF EVENT:ScrollTop
 OROF EVENT:ScrollBottom
  MyBrowse.TakeScroll                 !BrowseClass object handles it
 END
END
```

See Also: ScrollEnd, ScrollOne, ScrollPage

TakeVCRScroll (process a VCR scroll event)

TakeVCRScroll([*vcrevent*] **), VIRTUAL**

TakeVCRScroll Processes a VCR scroll event for the browse list.

vcrevent An integer constant, variable, EQUATE, or expression that specifies the scroll event. Valid scroll events are up one item, down one item, up one page, down one page, up to the first item, and down to the last item. If omitted, no scrolling occurs.

The **TakeVCRSroll** method processes a VCR scroll event for the browse

Implementation: A *vcrevent* value of VCR:Forward scrolls down one item; VCR:Backward scrolls up one item; VCR:PageForward scrolls down one page; VCR:PageBackward scrolls up one page; VCR:Last scrolls to the last list item; VCR:First scrolls to the first list item. Corresponding *vcrevent* EQUATEs are declared in \LIBSRC\ABTOOLBA.INC.

```
      ITEMIZE,PRE(VCR)
Forward      EQUATE(Toolbar:Down)
Backward     EQUATE(Toolbar:Up)
PageForward  EQUATE(Toolbar:PageDown)
PageBackward EQUATE(Toolbar:PageUp)
First        EQUATE(Toolbar:Top)
Last         EQUATE(Toolbar:Bottom)
Insert       EQUATE(Toolbar:Insert)
None         EQUATE(0)
      END
```

The TakeVCRScroll method calls the TakeScroll method, translating the *vcrevent* to the appropriate *scrollevent*.

Example:

```
 LOOP                        !process repeated scroll events
  IF VCRRequest = VCR:None   !if no more events
   BREAK                     !break out of loop
  ELSE                       !if scroll event
   MyBrowse.TakeVCRScroll( VCRRequest ) !BrowseClass object handles it
  END
 END
```

See Also: TakeScroll

UpdateBuffer (copy selected item from queue buffer to file buffer)

UpdateBuffer, VIRTUAL

The **UpdateBuffer** method copies corresponding data from the *queuefield* fields to the *filefield* fields specified by the AddField method for the currently selected browse item. Typically these are the browse list's queue buffer fields and the file buffer fields so that the file buffers match the currently selected browse list item.

Implementation: Many of the BrowseClass methods call the UpdateBuffer method.

Example:

```
IF FIELD() = ?FirstTab              !if first tab selected
 IF MyBrowse.SetSort(1,0)           !apply the first sort order
  MyBrowse.ResetThumbLimits         !if sort changed, reset thumb limits
 END
 MyBrowse.UpdateBuffer              !update file buffer from selected item
 MyBrowse.UpdateResets              !update file buffer from reset fields
END
```

See Also: AddField

UpdateQuery (set default query interface)

UpdateQuery(*querymanager*, [*casesensitive]***)**

UpdateQuery	Defines a default query interface for the BrowseClass object.
querymanager	The label of the BrowseClass object's QueryClass object. See *QueryClass* for more information.
casesensitive	A numeric constant, variable, EQUATE, or expression that indicates the case sensitivity of the query expression. If this parameter is omitted the query is case insensitive.

The **UpdateQuery** method defines a default query interface (dialog) for the BrowseClass object.

Tip: You may use the UpdateQuery method in combination with the QueryClass.AddItem method to define a query interface that contains the displayed fields plus other queryable items.

Implementation: The UpdateQuery method sets the value of the Query property, then calls the QueryClass.AddItem method for each displayed field, so that each displayed field accepts filter criteria in the query dialog.

Example:

```
QueryForm  QueryFormClass
QueryVis   QueryFormVisual
BRW1     CLASS(BrowseClass)
Q        &CusQ
         END

CusWindow.Init PROCEDURE()
  CODE
 !open files, views, window, etc.
 IF DefaultQuery
  BRW1.UpdateQuery(QueryForm)
 ELSE
  BRW1.Query &= QueryForm
  QueryForm.AddItem('UPPER(CUS:NAME)','','')
  QueryForm.AddItem('UPPER(CUS:CITY)','','')
  QueryForm.AddItem('CUS:ZIP_CODE','','')
 END
 RETURN Level:Benign
```

See Also: Query, QueryClass.AddItem

UpdateResets (copy reset fields to file buffer)

UpdateResets, PROTECTED

The **UpdateResets** method copies reset field values to corresponding file buffer fields.

The AddResetField method defines the reset fields for the BrowseClass object.

Implementation: The BrowseClass.Next an BrowseClass.Previous methods call the UpdateResets method.

Example:

```
MyBrowseClass.Next PROCEDURE          !method of class derived from BrowseClass
 CODE
 IF Level:Fatal = PARENT.Next()       !do parent method
  POST(EVENT:CloseWindow)             !if fails, shut down
 ELSE                                 !otherwise
  SELF.UpdateResets                   !update file buffer from reset fields
 END
```

See Also: AddResetField, Next, Previous

UpdateThumb (position the scrollbar thumb)

UpdateThumb

The **UpdateThumb** method positions the scrollbar thumb and enables or disables the vertical scroll bar depending on the number of items in the browse list, the currently selected item, and the active step distribution method. See *Control Templates--BrowseBox* for more information on thumb behavior.

Implementation: The AddSortOrder method sets the stepdistribution methods for the BrowseClass object.

Example:

```
IF FIELD() = ?MyBrowse                !focus on browse list
 IF EVENT() = EVENT:NewSelection      !if new selection
  IF MyBrowse.TakeNewSelection()      !BrowseClass object handles it
   MyBrowse.UdateThumb                !Reposition the thumb
  END
 END
END
```

UpdateThumbFixed (position the scrollbar fixed thumb)

UpdateThumbFixed, PROTECTED

The **UpdateThumbFixed** method positions the scrollbar fixed thumb and enables or disables the vertical scroll bar depending on the number of items in the browse list, the currently selected item, and the active step distribution method. See *Control Templates--BrowseBox* for more information on fixed thumb behavior.

Implementation: The AddSortOrder method sets the step distribution methods for the BrowseClass object.

Example:

```
MyBrowseClass.UpdateThumb PROCEDURE
 CODE
 IF SELF.Sort.Thumb &= NULL          !if no step object
  SELF.UpdateThumbFixed              !reposition thumb as fixed
 ELSE
                                     !reposition thumb per step object
 END
```

UpdateViewRecord (get view data for the selected item)

UpdateViewRecord, VIRTUAL

The **UpdateViewRecord** method regets the browse's VIEW record for the selected browse list item so the VIEW record can be written to disk. The UpdateViewRecord method arms automatic optimistic concurrency checking so the eventual write (PUT) to disk returns an error if another user changed the data since it was retrieved by UpdateViewRecord.

Imlementation: The UpdateViewRecord method uses WATCH and REGET to implement optimistic concurrency checking; see the *Language Reference* for more information.

Example:

```
IF FIELD() = ?ChangeButton          !on change button
 IF EVENT() = EVENT:Accepted        !if button clicked
  MyBrowse.UpdateViewRecord         !refresh buffers and arm WATCH
  DO MyBrowse:ButtonChange          !call the update routine
 END
END
```

UpdateWindow (update display variables to match browse)

UpdateWindow, VIRTUAL

The **UpdateWindow** method updates display variables to match the current state of the browse list.

Tip: Use ResetSort followed by UpdateWindow to refresh and redisplay your ABC BrowseBoxes. Or, use the WindowManager.Reset method.

Implementation: The BrowseClass.UpdateWindow method calls the appropriate LocatorClass.UpdateWindow method, which ensures the locator field contains the current search value.

Example:

```
IF FIELD() = ?MyBrowse             !focus on browse list
 IF EVENT) = EVENT:NewSelection    !if new selection
  IF MyBrowse.TakeNewSelection()   !BrowseClass object handles it
   MyBrowse.SetSort(0,1)           !reapply sort order
   MyBrowse.UpdateBuffer           !refresh file buffer from selected item
   MyBrowse.UpdateWindow           !update display variables (locator)
   DISPLAY()                       !and redraw the window
  END
 END
END
```

BrowseQueue Interface

BrowseQueue Concepts

The BrowseQueue interface is a defined set of behaviors that relate to the VIEW and QUEUE that the LIST control uses.

Relationship to Other Application Builder Classes

The StandardBehavior class implements the BrowseQueue interface. For more information, see the StandardBehavior class.

BrowseQueue Source Files

The BrowseQueue source code is installed by default to the Clarion \LIBSRC folder. The specific BrowseQueue source code and their respective components are contained in:

ABBROWSE.INC	BrowseQueue interface declaration
ABBROWSE.CLW	BrowseQueue method definitions

BrowseQueue Methods

Delete(remove entry in LIST queue)

Delete

The**Delete** method removes an entry in the queue that the LIST control is using.

Fetch(retrieve entry from LIST queue)

Fetch(*position***)**

Fetch	Retrieves an entry from the queue for the LIST control.
position	An integer constant, variable, EQUATE, or expression that indicates the relative position in the queue for the LIST.

The **Fetch** method retrieves an entry from the queue that the LIST control is using at the relative position specified.

Free(clear contents of LIST queue)

Free

The **Free** method clears all entries from the queue that the LIST control is using.

GetViewPosition(retrieve VIEW position)

GetViewPosition

The **GetViewPosition** method retrieves the VIEW's POSITION.

Return Data Type: STRING

Insert(add entry to LIST queue)

Insert([*position*])

Insert	Adds an entry to the queue for the LIST control.
position	An integer constant, variable, EQUATE, or expression that indicates the relative position in the queue for the LIST.

The **Insert** method adds an entry to the queue that the LIST control is using. If no position parameter is used, the entry is added to the end of the queue. If the position parameter is used, the entry is added at the relative position specified. If an entry exists at that position, it is moved down to make room for the new entry.

Records(return number of records)

Records

The **Records** method returns the number of records available in the queue for the LIST control.

Return Data Type: UNSIGNED

SetViewPosition(set VIEW position)

SetViewPosition(*position*)

SetViewPosition	Sets the POSITION of the VIEW.
position	A string constant, variable, EQUATE, or expression containing the POSITION to set in the VIEW.

The **SetViewPosition** sets the POSITION of the VIEW based on the position parameter.

Update(update entry in LIST queue)

Update

The **Update** method updates an entry in the queue that the LIST control is using.

Who(returns field name)

Who(*column*)

Who	Returns the queue field name for the specified column.
column	An integer constant, variable, EQUATE, or expression that contains a column number from the queue.

The **Who** method returns the queue field name for the column specified by the column parameter.

Return Data Type: STRING

BrowseToolbarClass

BrowseToolbarClass Overview

The BrowseToolbarClass handles events for specialized buttons for scrolling in the associated BrowseBox. This class works with the BrowseClass and the WindowManager objects to accomplish these tasks.

BrowseToolbarClass Concepts

The BrowseToolbarClass object interacts with the BrowseClass and WindowManager to allow the toolbar buttons to scroll the browse highlight bar within the BrowseBox. When a toolbar button is pressed and EVENT:Accepted is posted to the associated Browse control.

Relationship to Other Application Builder Classes

The BrowseToolbarClass works with the BrowseClass and WindowManager to accomplish its tasks.

BrowseToolbarClass ABC Template Implementation

The BrowseToolbarControl control template generates code to declare a BrowseToolbarClass object in the Browse procedure that the control template is placed. The templates also generate code to register the BrowseToolbarClass object with the BrowseClass and WindowManager objects, as well as initializing all toolbar button controls.

BrowseToolbarClass Source Files

The BrowseToolbarClass source code is installed by default to the Clarion \LIBSRC folder. The specific BrowseToolbarClass source code and their respective components are contained in:

ABTOOLBA.INC	BrowseToolbarClass declarations
ABTOOLBA.CLW	BrowseToolbarClass method definitions

BrowseToolbarClass Properties

Browse (BrowseClass object)

Browse **&BrowseClass, PROTIECTED**

The **Browse** property is a reference to the BrowseClass object. The BrowseToolbarClass object uses this property to access the BrowseClass object's properties and methods.

Implementation: The BrowseToolbarClass.Init method sets the value of the Browse property.

See Also: BrowseToolbarClass.Init

Button (toolbar buttons FEQ values)

Button SIGNED, DIM(Toolbar:Last+1-Toolbar:First), PROTECTED

The **Button** property is a dimensioned variable that holds the contol numbers (FEQ) of the buttons that are represented on the toolbar. A value of zero (0) disables the individual toolbar button

Implementation: The BrowseToolbarClass object uses this property to enable or disable a toolbar control.

Window (WindowManager object)

Window &WindowManager, PROTECTED

The **Window** property is a reference to the WindowManager object for this BrowseToolbarClass object. The WindowManager object forwards events to the BrowseToolbarClass object for processing.

Implementation: The BrowseToolbarClass.Init method sets the value of the Window property.

See Also: BrowseToolbarClass.Init

BrowseToolbarClass Methods

Init (initialize the BrowseToolbarClass object)

Init(*WindowManager***,** *BrowseClass***)**

Init	Initializes the BrowseToolbarClass object.
WindowManager	The label of the toolbar's WindowManager object. See Window Manager for more information.
BrowseClass	The label of the toolbar's BrowseClass object. See BrowseClass for more information.

The **Init** method initializes the BrowseToolbarClass object by declaring a reference to both the WindowManager and BrowseClass objects. All toolbar buttons are initialized to zero (0).

InitBrowse (initialize the BrowseToolbarClass update buttons)

InitBrowse(*insert, change, delete, select***)**

InitBrowse	Initializes the BrowseToolbarClass update buttons.
insert	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Insert control.
change	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Change control.
delete	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Delete control.
select	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Select control.

The **InitBrowse** method initializes the Button property with the control numbers (FEQ) for the update controls on the toolbar.

Inplementation: This method is called automatically by the ABC BrowseToolbarControl template.

InitMisc (initialize the BrowseToolbarClass miscellaneous buttons)

InitMisc(*history***,** *help***)**

InitMisc	Initializes the BrowseToolbarClass miscellaneous buttons.
history	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the History control.
help	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Help control.

The **InitMisc** method initializes the Button property with the control numbers (FEQ) for the History and Help controls on the toolbar.

Inplementation: This method is called automatically by the ABC BrowseToolbarControl template.

InitVCR (initialize the BrowseToolbarClass VCR buttons)

InitVCR(*top***,** *bottom***,** *pageup***,** *pagedown***,** *up***,** *down***,** *locate***)**

InitVCR	Initializes the BrowseToolbarClass VCR buttons.
top	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Top control.
bottom	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Bottom control.
pageup	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the PageUp control.
pagedown	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the PageDown control.
up	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Up control.
down	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Down control.
locate	An integer constant, variable, EQUATE, or expression that identifies the FEQ for the Locate control.

The **InitVCR** method initializes the Button property with the control numbers (FEQ) for the VCR controls on the toolbar.

Inplementation: This method is called automatically by the ABC BrowseToolbarControl template.

ResetButton (synchronize toolbar with a corresponding browse control)

ResetButton(*toolbutton***,** *browsebutton***), PROTECTED**

ResetButton	Sync Toolbar control properties with its corresponding Browse control.
toolbutton	An integer constant, variable, EQUATE, or expression that identifies a particular toolbar control.
browsebutton	An integer constant, variable, EQUATE, or expression that identifies a specific browse control.

The **ResetButton** method enables/disables, hides/unhides a toolbar control based on the current properties of its corresponding browse control.

There are predefined equates that represent each button available on the toolbar. These equates can be found at the top of ABTOOLBA.INC.

Inplementation: This method is called by the BrowseToolBarClass.ResetFromBrowse method.

ResetFromBrowse(synchronize toolbar controls with browse controls)

ResetFromBrowse, VIRTUAL

The **ResetFromBrowse** method synchronizes the toolbar controls with their corresponding brrowse control. These controls include the Select, Insert, Change, Delete, History, Help and Locate buttons.

Inplementation: This method is called from the BrowseToolBarClass.TakeEvent method.

TakeEvent(process the current event)

TakeEvent, VIRTUAL

The **TakeEvent** method processes all accepted events for the toolbar controls. When an accepted event occurs, an EVENT:Accepted is posted to the corresponding Browse control. When a NewSelection event occurs on the BrowseBox, the ResetFromBrowse method is called to redisplay the toolbar controls with the correct properties (hide, unhide, enable, disable).

A Level:Benign is returned from this method.

Return Data Type: BYTE

BufferedPairsClass

BufferedPairsClass Overview

The BufferedPairsClass is a FieldPairs class with a third buffer area (a "save" area). The BufferedPairsClass can compare the save area with the primary buffers, and can restore data from the save area to the primary buffers (to implement a standard "cancel" operation).

BufferedPairsClass Concepts

The BufferedPairsClass lets you move data between field pairs, and lets you compare the field pairs to detect whether any changes occurred since the last operation.

This class provides methods that let you identify or "set up" the targeted field pairs.

Note: The paired fields need not be contiguous in memory, nor do they need to be part of a structure. You can build a virtual structure simply by adding a series of otherwise unrelated fields to a BufferedPairsClass object. The BufferedPairsClass methods then operate on this virtual structure.

Once the field pairs are identified, you call a single method to move all the fields in one direction (left to right), and others single methods to move all the fields in the other directions (right to left, left to buffer, etc.). You simply have to remember which entity (set of fields) you described as "left" and which entity you described as "right." Other methods compares the sets of fields and return a value to indicate whether or not they are equivalent.

BufferedPairsClass Relationship to Other Application Builder Classes

The BufferedPairsClass is derived from the FieldPairsClass. The BrowseClass, ViewManager, and RelationManager use the FieldPairsClass and BufferedPairsClass to accomplish various tasks.

BufferedPairsClass ABC Template Implementation

Various ABC Library objects instantiate BufferedPairsClass objects as needed; therefore, the template generated code does not directly reference the BufferedPairsClass.

BufferedPairsClass Source Files

The BufferedPairsClass source code is installed in the Clarion \LIBSRC folder. The BufferedPairsClass source code and their respective components are contained in:

ABUTIL.INC	BufferedPairsClass declarations
ABUTIL.CLW	BufferedPairsClass method definitions

BufferedPairsClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a BufferedPairsClass object.

Let's assume you have a Customer file declared as:

```
Customer FILE,DRIVER('TOPSPEED'),PRE(CUST),CREATE,BINDABLE
ByNumber  KEY(CUST:CustNo),NOCASE,OPT,PRIMARY
Record    RECORD,PRE()
CustNo     LONG
Name       STRING(30)
Phone      STRING(20)
Zip        DECIMAL(5)
          END
         END
```

And you have a Customer queue declared as:

```
CustQ   QUEUE
CustNo   LONG
Name     STRING(30)
Phone    STRING(20)
Zip      DECIMAL(5)
        END
```

And you want to move data between the file buffer and the queue buffer.

```
 INCLUDE('ABUTIL.INC')                      !declare BufferedPairsClass
Fields  BufferedPairsClass                  !declare Fields object

 CODE
 Fields.Init                                !initialize Fields object
 Fields.AddPair(CUST:CustNo, CustQ.CustNo) !establish CustNo pair
 Fields.AddPair(CUST:Name,  CustQ.Name)     !establish Name pair
 Fields.AddPair(CUST:Phone, CustQ.Phone)    !establish Phone pair
 Fields.AddPair(CUST:Zip,  CustQ.Zip)       !establish Zip pair

 Fields.AssignLeftToRight                   !copy from Customer FILE to CustQ QUEUE
 Fields.AssignLeftToBuffer                  !copy from Customer FILE to save area
 !accept user input
 IF ACCEPTED() = ?RestoreButton
  Fields.AssignBufferToLeft                 !copy from save area to Customer FILE
  Fields.AssignBufferToRight                !copy from save area to Customer QUEUE
 END

 Fields.Kill                                !shut down Fields object
```

BufferedPairsClass Properties

BufferedPairsClass Properties

The BufferedPairsClass inherits the properties of the FieldPairsClass from which it is derived. See *FieldPairsClass Properties* for more information.

In addition to (or instead of) the inherited properties, the BufferedPairsClass contains the RealList property.

RealList (recognized field pairs)

RealList &FieldPairsQueue

The **RealList** property is a reference to the structure that holds all the field pairs recognized by the BufferedPairsClass object.

Use the AddPair method to add field pairs to the RealList property. For each field pair, the RealList property includes the designated "Left" field, the designated "Right" field, plus a "Buffer" field you can use as an intermediate storage area (a save area).

The "Left," "Right," and "Buffer" designations are reflected in other BufferedPairsClass method names (for example, field assignment methods--AssignLeftToRight and AssignRightToBuffer) so you can easily and accurately control the movement of data between the three sets of fields.

Implementation: During initialization, the BufferedPairsClass initialization method "points" the inherited List property to the RealList property so there is, in fact, only one list of fields which may be referred to as RealList.

RealList is a reference to a QUEUE declared in ABUTIL.INC as follows:

```
BufferedPairsQueue QUEUE,TYPE
Left                ANY
Right               ANY
Buffer              ANY
                   END
```

The Init method creates the List and RealList properties; the Kill method disposes of them. AddPair adds field pairs to the RealList property.

See Also: AddPair, Init, Kill

BufferedPairsClass Methods

BufferedPairsClass Methods

The BufferedPairsClass inherits all the methods of the FieldPairsClass from which it is derived. See *FieldPairsClass Methods* for more information.

In addition to (or instead of) the inherited methods, the BufferedPairsClass contains other methods listed below.

BufferedPairsClass Functional Organization
Expected Use

As an aid to understanding the BufferedPairsClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the BufferedPairsClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the BufferedPairsClass object
AddPair[v]	add a field pair to the List property
Kill	shut down the BufferedPairsClass object

[v] These methods are also Virtual.

Occasional Use:

AssignLeftToRight	assign each "left" field to its "right" counterpart
AssignLeftToBuffer	assign each "left" field to its "buffer" counterpart
AssignRightToLeft	assign each "right" field to its "left" counterpart
AssignRightToBuffer	assign each "right" field to its "buffer" counterpart
AssignBufferToLeft	assign each "buffer" field to its "left" counterpart
AssignBufferToRight	assign each "buffer" field to its "right" counterpart
EqualLeftRight	return 1 if each left equal right, otherwise return 0
EqualLeftBuffer	return 1 if each left equal buffer, otherwise return 0
EqualRightBuffer	return 1 if right equal buffer, otherwise return 0
ClearLeft	CLEAR each "left" field
ClearRight	CLEAR each "right" field

Inappropriate Use:

These methods are inherited from the FieldPairsClass and typically are not used in the context of this (BufferedPairsClass) derived class.

AddItem	add a field pair from one source field
Equal	return 1 if each left equal right, otherwise return 0

Virtual Methods

Typically you will not call these methods directly. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

AddPair (add a field pair:BufferedPairsClass)

AddPair(*left, right* **), VIRTUAL**

AddPair	Adds a field pair to the RealList property.
left	The label of the "left" field of the pair. The field may be any data type, but may not be an array.
right	The label of the "right" field of the pair. The field may be any data type, but may not be an array.

The **AddPair** method adds a field pair to the RealList property. A third "buffer" field is supplied for you. You may use this third "buffer" as an intermediate storage area (a save area).

The fields need not be contiguous in memory, nor do they need to be part of a structure. Therefore you can build a virtual structure simply by adding a series of otherwise unrelated fields to a BufferedPairs object. The other BufferedPairs methods then operate on this virtual structure.

Implementation: AddPair assumes the RealList property has already been created by Init or by some other method.

By calling AddPair for a series of fields (for example, the corresponding fields in a RECORD and a QUEUE), you effectively build three virtual structures containing the fields and a (one-to-one-to-one) relationship between the structures.

Example:

```
 INCLUDE('ABUTIL.INC')            !declare BufferedPairs Class
Fields  &BufferedPairsClass         !declare BufferedPairs reference

Customer FILE,DRIVER('TOPSPEED'),PRE(CUST),CREATE,BINDABLE
ByNumber  KEY(CUST:CustNo),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
CustNo      LONG
Name        STRING(30)
Phone       STRING(20)
           END
         END

CustQ   QUEUE
CustNo   LONG
Name     STRING(30)
Phone    STRING(20)
        END

 CODE
```

```
Fields &= NEW BufferedPairsClass          !instantiate BufferedPairs object
Fields.Init                               !initialize BufferedPairs object
Fields.AddPair(CUST:CustNo, CustQ.CustNo) !establish CustNo pair
Fields.AddPair(CUST:Name,  CustQ.Name)    !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone)   !establish Phone pair
```

See Also: Init, RealList

AssignBufferToLeft (copy from "buffer" fields to "left" fields)

AssignBufferToLeft

The **AssignBufferToLeft** method copies the contents of each "buffer" field to its corresponding "left" field in the RealList property.

Implementation: The "left" field is the *first* (left) parameter of the AddPair method. The "right" field is the *second* (right) parameter of the AddPair method. The BufferedPairsClass automatically supplies the "buffer" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.EqualRightBuffer             !compare QUEUE fields to save buffer
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToLeft              !copy changes to CUST (write) buffer
 OF BUTTON:Yes
  Fields.AssignBufferToLeft             !restore original to CustQ (display) buffer
 END
END
```

See Also: AddPair, RealList

AssignBufferToRight (copy from "buffer" fields to "right" fields)

AssignBufferToRight

The **AssignBufferToRight** method copies the contents of each "buffer" field to its corresponding "right" field in the RealList property.

Implementation: The "left" field is the *first* (left) parameter of the AddPair method. The "right" field is the *second* (right) parameter of the AddPair method. The BufferedPairsClass automatically supplies the "buffer" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.EqualRightBuffer             !compare QUEUE fields to save buffer
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToBuffer
 OF BUTTON:Yes
  Fields.AssignBufferToRight
 END
END
```

See Also: AddPair, RealList

AssignLeftToBuffer (copy from "left" fields to "buffer" fields)

AssignLeftToBuffer

The **AssignLeftToBuffer** method copies the contents of each "left" field to its corresponding "buffer" field in the RealList property.

Implementation: The "left" field is the *first* (left) parameter of the AddPair method. The "right" field is the *second* (right) parameter of the AddPair method. The BufferedPairsClass automatically supplies the "buffer" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.EqualRightBuffer             !compare QUEUE fields to save buffer
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToLeft
 OF BUTTON:Yes
  Fields.AssignLeftToBuffer
 END
END
```

See Also: AddPair, RealList

AssignRightToBuffer (copy from "right" fields to "buffer" fields)

AssignRightToBuffer

The **AssignRightToBuffer** method copies the contents of each "right" field to its corresponding "buffer" field in the RealList property.

Implementation: The "left" field is the *first* (left) parameter of the AddPair method. The "right" field is the *second* (right) parameter of the AddPair method. The BufferedPairsClass automatically supplies the "buffer" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.EqualRightBuffer             !compare QUEUE fields to save buffer
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToBuffer
 OF BUTTON:Yes
  Fields.AssignBufferToRight
 END
END
```

See Also: AddPair, RealList

EqualLeftBuffer (compare "left" fields to "buffer" fields)

EqualLeftBuffer

The **EqualLeftBuffer** method returns one (1) if each "left" field equals its corresponding "buffer" field; otherwise it returns zero (0).

Implementation: The "left" field is the *first* (left) parameter of the AddPair method. The "right" field is the *second* (right) parameter of the AddPair method. The BufferedPairsClass automatically supplies the "buffer" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.EqualLeftBuffer              !compare CUST fields to save buffer
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToLeft              !copy changes to CUST (write) buffer
 OF BUTTON:Yes
  Fields.AssignBufferToLeft             !restore original to CustQ (display) buffer
 END
END
```

See Also: AddPair, RealList

EqualRightBuffer (compare "right" fields to "buffer" fields)

EqualRightBuffer

The **EqualRightBuffer** method returns one (1) if each "right" field equals its corresponding "buffer" field; otherwise it returns zero (0).

Implementation: The "left" field is the *first* (left) parameter of the AddPair method. The "right" field is the *second* (right) parameter of the AddPair method. The BufferedPairsClass automatically supplies the "buffer" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.EqualRightBuffer             !compare CUST fields to save buffer
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToLeft              !copy changes to CUST (write) buffer
 OF BUTTON:Yes
  Fields.AssignBufferToLeft             !restore original to CustQ (display) buffer
 END
END
```

See Also: AddPair, RealList

Init (initialize the BufferedPairsClass object)

Init

The **Init** method initializes the BufferedPairsClass object.

Implementation: The Init method creates the List and RealList properties. This method "points" the inherited List property to the RealList property so there is, in fact, only one list of fields which may be referred to as RealList.

Example:

```
 INCLUDE('ABUTIL.INC')            !declare BufferedPairs Class
Fields  &BufferedPairsClass       !declare BufferedPairs reference

 CODE
 Fields &= NEW BufferedPairsClass !instantiate BufferedPairs object
 Fields.Init                      !initialize BufferedPairs object
 .
 .
 .
 Fields.Kill                      !terminate BufferedPairs object
 DISPOSE(Fields)                  !release memory allocated for BufferedPairs object
```

See Also: Kill, List, RealList

Kill (shut down the BufferedPairsClass object)

Kill

The **Kill** method disposes any memory allocated during the object's lifetime and performs any other necessary termination code.

Implementation: The Kill method disposes the List and RealList properties created by the Init method.

Example:

```
 INCLUDE('ABUTIL.INC')            !declare BufferedPairs Class
Fields  &BufferedPairsClass       !declare BufferedPairs reference

 CODE
 Fields &= NEW BufferedPairsClass !instantiate BufferedPairs object
 Fields.Init                      !initialize BufferedPairs object
 .
 .
 .
 Fields.Kill                      !terminate BufferedPairs object
 DISPOSE(Fields)                  !release memory allocated for BufferedPairs object
```

See Also: Init, List, RealList

ConstantClass

ConstantClass Overview

The ConstantClass provides an easy, flexible, and efficient way to "loop through" constant data. That is, the ConstantClass parses structures like the following so you can access each (unlabeled) data item discretely:

```
Errors  GROUP,STATIC
Items    USHORT(40)                      !item count
         USHORT(Msg:RebuildKey)          !begin item 1
         BYTE(Level:Notify)
         PSTRING('Invalid Key')
         USHORT(Msg:RebuildFailed)       !begin item 2
         BYTE(Level:Fatal)
         PSTRING('Key was not built')
         !38 more USHORT,BYTE,PSTRING combinations
        END
```

ConstantClass Concepts

The ConstantClass parses and loads constant data such as error messages or translation text from the GROUP structure that declares the data into other data structures or memory variables (one item at a time). It can also write all the constant data into a QUEUE or a FILE.

The ConstantClass intelligently handles irregular data--you can declare the constant text data with a series of strings of varying lengths so that no space is wasted. The ConstantClass also handles a variety of numeric datatypes including BYTE, SHORT, USHORT, and LONG.

The ConstantClass provides several ways to stop processing the constant data, including a simple item count, a text match, and a read-to-the-end option.

A single ConstantClass object can process multiple GROUP structures with the same (or incremental) layouts.

Declaring the Data

To use the ConstantClass, you must declare the constant data within a GROUP structure. The GROUP structure may declare a single sequence using any combination of the permitted datatypes, or a series of such sequences (the GROUP repeats the combination of datatypes as many times as needed). The ConstantClass permits CSTRING, PSTRING, BYTE, SHORT, USHORT, and LONG datatypes. The GROUP structure may contain an initial BYTE or USHORT that specifies how many times a sequence of datatypes is repeated. For example:

```
Errors  GROUP,STATIC
Items     BYTE(2)                   !optional item count
          USHORT(Msg:RebuildKey)    !begin first item
          BYTE(Level:Notify)
          PSTRING('Invalid Key')    !end first item
          USHORT(Msg:RebuildFailed) !begin second item
          BYTE(Level:Fatal)
          PSTRING('Key not built')  !end second item
        END
```

Here is another example of a structure the ConstantClass can handle:

```
Translation  GROUP,STATIC                       !no item count
              PSTRING('&Across')                !default text
              PSTRING('')                       !translation text
              PSTRING('Align all window Icons') !default text
              PSTRING('')                       !translation text
              PSTRING('Arrange Icons')          !default text
              PSTRING('')                       !translation text
            END
```

If the GROUP is declared within a procedure it must have the STATIC attribute. See the *Language Reference* for more information.

Describing the Data

The ConstantClass uses two methods to describe or understand the structure of the constant data it processes: the Init method and the AddItem method. The Init method (*termination* parameter) indicates whether or not the GROUP structure declares an item count as well as the datatype of the item count (see Init). The AddItem method identifies each repeating component of the GROUP structure as well as the target variable that receives the contents of the repeating component (see AddItem).

ConstantClass Relationship to Other Application Builder Classes

The TranslatorClass, ErrorClass, ToolbarClass, and PrintPreview classes all use the ConstantClass. These classes automatically instantiate the ConstantClass as needed.

ConstantClass ABC Template Implementation

All ABC Library references to the ConstantClass are encapsulated with ABC Library methods--the ABC Templates do not directly reference the ConstantClass.

ConstantClass Source Files

The ConstantClass source code is installed by default to the Clarion \LIBSRC. The specific ConstantClass source code and their respective components are contained in:

ABUTIL.INC	ConstantClass declarations
ABUTIL.CLW	ConstantClass method definitions

ConstantClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a ConstantClass object. The example loads translation pairs from a constant GROUP into two CSTRINGs, which are then passed as parameters to another TranslatorClass method. Note that the target CSTRINGs could just as easily be fields in a QUEUE or FILE buffer.

```
  INCLUDE('ABUTIL.INC')            !declare ConstantClass, TranslatorClass
Spanish   GROUP                    !declare constant data
Items     BYTE(50)                 !item count
       PSTRING('One')              !begin first item
       PSTRING('Uno')
       PSTRING('Two')              !begin second item
       PSTRING('Dos')
       !48 more PSTRING pairs
      END

LangQ  QUEUE
Text     CSTRING(50)
Repl     CSTRING(50)
Done     BYTE
       END

Const  ConstantClass                  !declare & instantiate Const object
Text     CSTRING(255),AUTO            !a variable to receive a constant value
Repl     CSTRING(255),AUTO            !a variable to receive a constant value
```

```
EndFlag  BYTE                          !terminator flag

 CODE
 !process items one-at-a-time:
 Const.Init(Term:BYTE)                          !initialize the Const object,
                                                !the first BYTE contains item count
 Const.AddItem(ConstType:PString, Text)         !Describe constant structure and
 Const.AddItem(ConstType:PString, Repl)         ! variables to accept the values
 Const.AddItem(ConstType:PString, EndFlag)
 Const.TerminatorValue = 1                      ! terminate when endFlag =1
 Const.TerminatorField = 50                     ! 50th field is the terminating field
 Const.TerminatorInclude = True                 ! include the terminating record
 Const.Set(Spanish)                             ! pass the constant data to Const object
 LOOP WHILE Const.Next()= Level:Benign          !copy constant data one at a time
  !do something with Text and Repl              !to AddItem variables
 END
 Const.Kill                                     !shut down Const object

                                                !process all items at a time:
 Const.Init(Term:BYTE)                          !re initialize the Const object,
                                                !the first BYTE contains item count
 Const.AddItem(ConstType:PString,LangQ.Text)    !Describe constant structure and
 Const.AddItem(ConstType:PString,LangQ.Repl)    ! variables to accept the values
 Const.Set(Spanish)                             !pass the constant data to Const object
 Const.Next(LangQ)                              !copy all constant items to the LangQ
 Const.Kill                                     !shut down Const object
```

ConstantClass Properties

TerminatorField (identify the terminating field)

TerminatorField **USHORT**

The **TerminatorField** property contains a value that can be set to a number that represents the number (1 based) of the field that will tested to see if it contains the termination value. The default value is 1.

See Also:

TerminatorInclude

TerminatorValue

ConstantClass.Next

Conceptual Example

TerminatorInclude (include matching terminator record)

7

TerminatorInclude **BOOL**

The **TerminatorInclude** property, when set to true (1), will include the record that matches the terminator value in the "returned records". When set to FALSE (0), the record containing the termination value will not be included in the returned records. By default, this property is set to FALSE (0)

See Also:

TerminatorField

TerminatorValue

Conceptual Example

ConstantClass.Next

TerminatorValue (end of data marker)

TerminatorValue ANY

The **TerminatorValue** property contains a value that the ConstantClass object looks for within the constant data. When the ConstantClass object finds the TerminatorValue, it stops processing the constant data (inclusive).

The TerminatorValue property is only one of several techniques you can use to mark the end of the constant data. See the Init method for more information on this and other techniques.

Implementation: The Init method CLEARs the TerminatorValue property; therefore, you should set the TerminatorValue property *after* the Init method executes.

The Next() method returns Level:Notify when the characters of the constant data matches the value of the TerminatorValue property. The Next(FILE) and Next(QUEUE) methods stop processing when the ConstantClass object finds the TerminatorValue.

The TerminatorField property can be set to a number that represents the number (1 based) of the field that will tested to see if it contains the termination value.

When the TerminatorInclude property is set to true, this will include the record that matches the terminator value in the 'returned records'. When false, the record containing termination value will not be included in the returned records. By default this is set to false.

See Also: Init, Next

ConstantClass Methods

ConstantClass Functional Organization--Expected Use

As an aid to understanding the ConstantClass, it is useful to organize the its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ConstantClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the ConstantClass object
AddItem	set constant datatype and target variable
Set	set the constant data to process
Kill	shut down the ConstantClass object

Mainstream Use:

Next	copy one or all constant items to targets

Occasional Use:

Reset	reset the object to beginning of the constant data

Virtual Methods

The ConstantClass has no virtual methods.

AddItem (set constant datatype and target variable)

AddItem(*datatype, target* **)**

AddItem	Sets the (repeating) constant datatype and its corresponding target variable.
datatype	An integer constant, variable, EQUATE or expresssion that identifies the datatype of a repeating constant within the constant GROUP structure. Valid *datatype* values are ConstType:Cstring, ConstType:Pstring, ConstType:Byte, ConstType:Short, ConstType:Ushort, and ConstType:Long.
target	The label of the variable that receives the constant value.

The **AddItem** method sets a (repeating) constant datatype and its corresponding target variable. Use multiple calls to the AddItem method to "describe" the constant data structure as well as the target variables that receive the constant data.

Implementation: You should call AddItem for each repeating datatype declared in the constant GROUP structure. The Next method processes the constant data items described by the AddItem calls. EQUATEs for the *datatype* parameter are declared in ABUTIL.INC:

```
    ITEMIZE(1),PRE(ConstType)
First   EQUATE
Cstring EQUATE(ConstType:First)
Pstring EQUATE
Byte    EQUATE            !1 byte unsigned integer
Short   EQUATE            !2 byte signed integer
UShort  EQUATE            !2 byte unsigned interger
Long    EQUATE            !4 byte signed integer
Last    EQUATE(ConstType:Long)
    END
```

Example:

```
Errors GROUP,STATIC
        USHORT(Msg:RebuildKey)     !begin first item
        PSTRING('Invalid Key')     !end first item
        USHORT(Msg:RebuildFailed)  !begin second item
        PSTRING('Key not built')   !end second item
       END
ErrorQ QUEUE
ID      LONG
Text    CSTRING(255)
       END
 CODE
 !The following describes the Errors GROUP and its corresonding target variables
 Const.AddItem(ConstType:Ushort, ErrorQ.ID)   !USHORT constant maps to error ID
 Const.AddItem(ConstType:PString, ErrorQ.Text)!PSTRING constant maps to error text
```

See Also: Next

Init (initialize the ConstantClass object)

Init([*termination*] **)**

Init	Initializes the ConstantClass object.
termination	An integer constant, variable, EQUATE or expresssion that controls when the Next(FILE) and Next(QUEUE) methods stop processing the constant data. If omitted, *termination* defaults to Term:Ushort. Valid *termination* values are Term:Ushort, Term:Byte, Term:EndGroup, andTerm:FieldValue

The **Init** method initializes the ConstantClass object.

The termination parameter provides two important pieces of information to the ConstantClass object: it tells the ConstantClass object whether there is a non-repeating item count declared at the beginning of the constant data (describes the structure of the constant data), and it tells the ConstantClass object how to recognize the end of the constant data. Valid *termination* values are:

Term:Ushort	The GROUP declares a USHORT containing the item count--stops reading when item count reached.
Term:Byte	The GROUP declares a BYTE containing the item count--stops reading when item count reached.
Term:EndGroup	The GROUP does not declare an item count—stops reading at end of GROUP structure.
Term:FieldValue	The GROUP does not declare an item count—stops reading when it finds the TerminatorValue within the constant data.

Implementation: The Init method CLEARs the TerminatorValue property. The Init method allocates memory and should always be paired with the Kill method, which frees the memory.

EQUATEs for the *termination* parameter are declared in ABUTIL.INC:

```
     ITEMIZE(1),PRE(Term)
EndGroup   EQUATE !Stops reading at end of GROUP
UShort     EQUATE !Reads number of items specified by USHORT at start of group
Byte       EQUATE !Reads number of items specified by BYTE at start of group
FieldValue EQUATE !Stops when specified value is found in first AddItem field,
           !only first 32 chars are compared
     END
```

Example:

```
 Const.Init(Term:BYTE)           !Initialize the Const object,
                                 !the first BYTE contains item count

 Const.AddItem(ConstType:PString, LangQ.Text)
```

```
!Describe constant structure and variables to accept the values
Const.AddItem(ConstType:PString, LangQ.Repl)

Const.Set(Spanish)              !pass the constant data to Const object
Const.Next(LangQ)               !copy all constant items to the LangQ
Const.Kill                      !shut down Const object
```

See Also: Kill, Next, TerminatorValue

Kill (shut down the ConstantClass object)

Kill

The **Kill** method frees any memory allocated during the life of the object and does any other required termination code.

Example:

```
Const.Init(Term:BYTE)   !Initialize the Const object,
                        ! the first BYTE contains item count
Const.AddItem(ConstType:PString, LangQ.Text) !Describe constant structure and
Const.AddItem(ConstType:PString, LangQ.Repl) !variables to accept the values
Const.Set(Spanish)      !pass the constant data to Const object
Const.Next(LangQ)       !copy all constant items to the LangQ
Const.Kill              !shut down Const object
```

Next (load all constant items to file or queue)

Next(| *file* | **)**

| *queue* | **)**

Next	Loads all the constant items to a file or queue.
file	The label of the FILE to which to ADD each constant item.
queue	The label of the QUEUE to which to ADD each constant item.

The **Next** method processes all of the constant items and executes an ADD(*file*) or ADD(*queue*) for each item.

Prior calls to the AddItem method determine the makeup of the item as well as the target variables that receive the item. The target variables should be within the *file* or *queue* structure to make the corresponding ADD meaningful.

The Init method determines what constitutes the end of the constant data.

Implementation: The Next(FILE) and Next(QUEUE) methods call the Next() method for each constant item, then execute an ADD(*file*) or ADD(*queue*) for each item.

Example:

```
Spanish   GROUP                !declare constant data
Items      BYTE(50)            !item count
           PSTRING('One')      !begin first item
           PSTRING('Uno')
           PSTRING('Two')      !begin second item
           PSTRING('Dos')
           !48 more PSTRING pairs
          END

LangQ    QUEUE
Text      CSTRING(50)
Repl      CSTRING(50)
         END

Const  ConstantClass     !declare & instantiate Const object
Text  CSTRING(255),AUTO  !a variable to receive a constant value
Repl  CSTRING(255),AUTO  !a variable to receive a constant value
 CODE
 !process all items at a time
 Const.Init(Term:BYTE)   !Initialize the Const object,
                         ! the first BYTE contains item count
```

```
Const.AddItem(ConstType:PString, LangQ.Text) !Describe constant structure and
Const.AddItem(ConstType:PString, LangQ.Repl) ! variables to accept the values
Const.Set(Spanish)      !pass the constant data to Const object
Const.Next(LangQ)       !copy all constant items to the LangQ
Const.Kill              !shut down Const object
```

See Also: AddItem, Init, Next

Next (copy next constant item to targets)

Next, PROC

The **Next** method copies the next constant item to its respective targets (as defined by the AddItem method) and returns a value indicating whether the item was copied. A return value of Level:Benign indicates the item was copied successfully; a return value of Level:Notify indicates the item was not copied because the end of the constant data, as defined by the Init method, was reached.

Prior calls to the AddItem method determine the makeup of the item as well as the target variables that receive the item.

Implementation: The Next method parses a single item in the constant data, performing any required datatype conversions, and increments appropriate internal counters.

Return Data Type: BYTE

Example:

```
Spanish GROUP           !declare constant data
Items    BYTE(50)       !item count
         PSTRING('One') !begin first item
         PSTRING('Uno')
         PSTRING('Two') !begin second item
         PSTRING('Dos')
         !48 more PSTRING pairs
        END

Const  ConstantClass      !declare & instantiate Const object
Text  CSTRING(255),AUTO   !a variable to receive a constant value
Repl  CSTRING(255),AUTO   !a variable to receive a constant value
 CODE
 !process items one-at-a-time
 Const.Init(Term:BYTE)    !initialize the Const object,
                          ! the first BYTE contains item count
 Const.AddItem(ConstType:PString, Text)     !Describe constant structure and
 Const.AddItem(ConstType:PString, Repl)     ! variables to accept the values
 Const.Set(Spanish)       !pass the constant data to Const object
 LOOP WHILE Const.Next()=Level:Benign       !copy constant data one item at a time
  !do something with Text and Repl          ! to respective AddItem target variables
 END
 Const.Kill               !shut down Const object
```

See Also: AddItem, Init, Next

Reset (reset the object to the beginning of the constant data)

Reset

The **Reset** method resets internal counters to start processing constant data from the beginning.

Implementation: The Set, Next(FILE) and Next(QUEUE) methods call the Reset method. Typically you will not call this method.

Example:

```
ConstantClass.Set PROCEDURE(*STRING Src)
 CODE
 DISPOSE(SELF.Str)
 SELF.Str &= NEW STRING(LEN(Src))
 SELF.Str = Src
 SELF.SourceSize=LEN(SELF.Str)
 SELF.Reset
```

Set (set the constant data to process)

Set(*datasource* **)**

Set	Sets the GROUP structure to process.
datasource	The label of the GROUP structure the ConstantClass object processes.

The **Set** method sets the GROUP structure to process.

Implementation: The Set method takes a copy of *datasource* and calls the Reset method to reset internal counters to process *datasource* copy from the beginning.

Example:

```
Spanish   GROUP           !declare constant data
Items      BYTE(50)       !item count
           PSTRING('One') !begin first item
           PSTRING('Uno')
           PSTRING('Two') !begin second item
           PSTRING('Dos')
           !48 more PSTRING pairs
          END

LangQ    QUEUE
Text     CSTRING(50)
Repl     CSTRING(50)
      END

Const  ConstantClass      !declare & instantiate Const object

 CODE
 !process all items at a time
 Const.Init(Term:BYTE)     !re initialize the Const object,
                           ! the first BYTE contains item count
 Const.AddItem(ConstType:PString, LangQ.Text)  !Describe constant structure and
 Const.AddItem(ConstType:PString, LangQ.Repl)  ! variables to accept the values
 Const.Set(Spanish)        !pass the constant data to Const object
 Const.Next(LangQ)         !copy all constant items to the LangQ
 Const.Kill                !shut down Const object
```

See Also: Reset

Crystal8 Class

Seagate Software's Crystal Reports is one of the leading report writers delivering Windows reports. For more information on this product see Seagate Software at www.seagatesoftware.com.

Clarion's Crystal Report interface is comprised of templates, libraries, and DLLs that communicate with Seagate's Crystal Reports, version 8. The DLL is accessed by a Class Interface and is hooked to your application using simple standard Clarion code. This interface allows a seamless integration of previously defined Crystal reports within a Clarion application. The Crystal report engine accesses data and creates the report. The report can be previewed in a Clarion window.

Clarion's Crystal Reports implementation is compatible with both the ABC and Legacy templates. It can only be used in 32-bit applications.

Crystal8 Class Concepts

Clarion's Crystal Reports implementation is a DLL that communicates with Seagate Software's Crystal Reports report writer. The Crystal 8 Class accesses the DLL. There are several templates available which make the interface to the report writer easily accessible from your Clarion program. Previewing and/or printing reports are simple.

Relationship to Other Application Builder Classes

The Crystal8 class works independently of all other ABC classes.

ABC Template Implementation

The PreviewCrystalReport and PrintCrystalReport template extensions instantiate an object based on the object name specified by either of these extensions. The object is instantiated in the procedure where the extension exists.

Crystal8 Source Files

The Crystal8 class declarations are installed by default to the Clarion \LIBSRC folder. The Crystal8 component is distributed as a LIB/DLL, therefore the source code for the methods is not available. However, the methods are defined in this chapter and may be implemented in applications provided the required LIB/DLL is available at runtime.

C60cr8.INC	Crystal Class Definition
C60cr8l.INC	Crystal Class Definition Local Compile
C60cr8.dll	Crystal DLL
C60cr8.lib	Crystal LIB
C60cr8L.lib	Crystal Local LIB

Crystal8 Class Properties

There are no properties associated with the Crystal8 Class Library.

Crystal8 Methods

AllowPrompt (prompt for runtime parameter data)

AllowPrompt(| *allowpromptflag* |)

AllowPrompt	Allow report runtime prompting for Crystal Parameter fields.
Allowpromptflag	An integer constant, variable, EQUATE, or expression that specifies whether the report will prompt for runtime parameter fields. A value of one (1) is used to allow prompting; a value of zero (0) is used to disallow field prompting.

The AllowPrompt method can conditionally allow the Crystal report that is being previewed or printed to prompt for runtime parameter fields. These parameter fields must be defined in the Crystal report. This method returns a BYTE representing the value of *allowpromptflag*.

Return Data Type: BYTE

Example:

```
oCrystal8.AllowPrompt(1)
```

CanDrillDown(allow Crystal drill down support)

CanDrillDown(| *candrilldown* |)

CanDrillDown — Allows use of Crystal Report's drill down feature.

candrilldown — An integer constant, variable, EQUATE, or expression that specifies whether the report make use of Crystal's drill down feature. A value of one (1) allows drill down to be used; a value of zero (0) removes the ability to drill down.

The CanDrillDown method allows a Crystal Report to use the defined drill down support. For more information on Crystal's drill down feature refer to the Crystal Report documentation. This method returns a BYTE representing the value of *candrilldown*.

Return Data Type: BYTE

Example:

```
oCrystal8.CanDrillDown(1)
```

HasCancelButton (display cancel button on report preview)

HasCancelButton (| *hascancelbutton* |)

HasCancelButton	Allow a cancel button on the report preview window.
hascancelbutton	An integer constant, variable, EQUATE, or expression that specifies whether a cancel button will appear on the report's preview window. A value of one (1) displays the cancel button; a value of zero (0) does not display the cancel button.

The HasCancelButton method is used to optionally display a cancel button on the report preview window. This method returns a BYTE representing the value of *hascancelbutton*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasCancelButton(1)
```

HasCloseButton (display close button on report preview)

HasCloseButton (| *hasclosebutton* |)

HasCloseButton	Allow a close button on the report preview window.
hasclosebutton	An integer constant, variable, EQUATE, or expression that specifies whether a close button will appear on the reports preview window. A value of one (1) displays the close button; a value of zero (0) does not display the close button.

The HasCloseButton method is used to optionally display a close button on the report preview window. This method returns a BYTE representing the value of *hasclosebutton*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasCloseButton(1)
```

HasExportButton (display export button on report preview)

HasExportButton (| *hasexportbutton* |)

HasExportButton	Allow an export button on the report preview window.
hasexportbutton	An integer constant, variable, EQUATE, or expression that specifies whether an export button will appear on the reports preview window. A value of one (1) displays the export button; a value of zero (0) does not display the export button.

The HasExportButton method is used to optionally display an export button on the report preview window. This method returns a BYTE representing the value of *hasexportbutton*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasExportButton(1)
```

HasLaunchButton (display launch button on report preview)

HasLaunchButton (| *haslaunchbutton* |)

HasLaunchButton	Allow a launch button on the report preview window.
haslaunchbutton	An integer constant, variable, EQUATE, or expression that specifies whether a launch button will appear on the reports preview window. A value of one (1) displays the launch button; a value of zero (0) does not display the launch button.

The HasLaunchButton method is used to optionally display a launch button on the report preview window. This method returns a BYTE representing the value of haslaunchbutton. The launch button is used to launch the Seagate Analysis tool.

Return Data Type: BYTE

Example:

```
oCrystal8.HasLaunchButton(1)
```

HasNavigationControls (display navigation controls on report preview)

HasNavigationControls (| *hasnavigationcontrols* |)

HasNavigationControls	Allows navigation controls on the report preview window.
hasnavigationcontrols	An integer constant, variable, EQUATE, or expression that specifies whether the navigation controls will appear on the report's preview window. A value of one (1) displays the navigation controls; a value of zero (0) does not display the navigation controls.

The HasNavigationControls method is used to optionally display navigation controls on the report preview window. This method returns a BYTE representing the value of *hasnavigationcontrols*. Navigation controls are used to navigate through a report, immediately to the beginning, end or anywhere in between.

Return Data Type: BYTE

Example:

```
oCrystal8.HasNavigationControls(1)
```

HasPrintButton (display print button on report preview)

HasPrintButton (| *hasprintbutton* |)

HasPrintButton	Allows a print button on the report preview window.
Hasprintbutton	An integer constant, variable, EQUATE, or expression that specifies whether a print button will appear on the report's preview window. A value of one (1) displays the print button; a value of zero (0) does not display the print button.

The HasPrintButton method is used to optionally display a print button on the report preview window. This method returns a BYTE representing the value of *hasprintbutton*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasPrintButton(1)
```

HasPrintSetupButton (display print setup button on report preview)

HasPrintSetupButton (| *hasprintsetupbutton* |)

HasPrintSetupButton	Allows a print setup button on the report preview window.
hasprintsetupbutton	An integer constant, variable, EQUATE, or expression that specifies whether a print setup button will appear on the reports preview window. A value of one (1) displays the print setup button; a value of zero (0) does not display the print setup button.

The HasPrintSetupButton method is used to optionally display a print setup button on the report preview window. This method returns a BYTE representing the value of *hasprintsetupbutton*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasPrintSetupButton(1)
```

HasProgressControls (display progress controls on report preview)

HasProgressControls (| *hasprogresscontrols* |)

HasProgressControls	Allows navigation controls on the report preview window.
Hasprogresscontrols	An integer constant, variable, EQUATE, or expression that specifies whether the progress controls will appear on the reports preview window. A value of one (1) displays the progress controls; a value of zero (0) does not display the progress controls.

The HasProgressControls method is used to optionally display progress controls on the report preview window. This method returns a BYTE representing the value of *hasprogresscontrol*. The Progress controls display the progress of the report when it is running. It displays records read, records selected, etc.).

Return Data Type: BYTE

Example:

```
oCrystal8.HasProgressControls(1)
```

HasRefreshButton (display refresh button on report preview)

HasRefreshButton (| *hasrefreshbutton* |)

HasRefreshButton	Allows a refresh button on the report preview window.
hasrefreshbutton	An integer constant, variable, EQUATE, or expression that specifies whether a refresh button will appear on the report's preview window. A value of one (1) displays the refresh button; a value of zero (0) does not display the refresh button.

The HasRefreshButton method is used to optionally display a refresh button on the report preview window. This method returns a BYTE representing the value of *hasrefreshbutton*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasRefreshButton(1)
```

HasSearchButton (display search button on report preview)

HasSearchButton (| *hassearchbutton* |)

HasSearchButton	Allows a search button on the report preview window.
hassearchbutton	An integer constant, variable, EQUATE, or expression that specifies whether a search button will appear on the reports preview window. A value of one (1) displays the search button; a value of zero (0) does not display the search button.

The HasSearchButton method is used to optionally display a search button on the report preview window. This method returns a BYTE representing the value of *hassearchbutton*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasSearchButton(1)
```

HasZoomControl (display zoom control on report preview)

HasZoomControl (| *haszoomcontrol* |)

HasZoomControl	Allows a zoom control on the report preview window.
haszoomcontrol	An integer constant, variable, EQUATE, or expression that specifies whether a zoom button will appear on the report's preview window. A value of one (1) displays the zoom control; a value of zero (0) does not display the zoom control.

The HasZoomControl method is used to optionally display a zoom control on the report preview window. This method returns a BYTE representing the value of *haszoomcontrol*.

Return Data Type: BYTE

Example:

```
oCrystal8.HasZoomControl(1)
```

Init (initialize Crystal8 object)

Init (*reportname*)

Init	Initialize the Crystal8 object.
reportname	A string constant, variable, EQUATE, or expression containing the report name. This report name is used when previewing a report. It is also the window caption (text).

The Init method initializes the Crystal8 object. This method also sets the title of the preview window, if the report is previewed. A BYTE is returned from this method and represents whether the report engine is successfully initialized.

Return Data Type: BYTE

Example:

```
oCrystal8.Init( ReportPathName )
```

Kill (shut down Crystal8 object)

Kill

The Kill method shuts down the Crystal8 object, releasing any memory allocated durring the lifetime of the object.

Example:

```
oCrystal8.Kill()
```

Preview (preview a Crystal Report)

Preview (| *windowtitle*, *initstate*, *frame*, *icon*, *systemmenu*, *maximizebox*, *3dflag*|)

Preview — Preview a Crystal Report.

windowtitle — A string constant, variable, EQUATE, or expression containing the text to display in the report preview window's title bar. This parameter is optional.

initstate — A string constant, variable, EQUATE, or expression containing an **N**, **M**, or **I**. Use **N** (Normal) to display the preview window at the default size. Use **M** (Maximized) to display the preview window in a maximized state. Use **I** (Iconized) to display the preview window in an iconized state. This parameter is optional.

frame — A string constant, variable, EQUATE, or expression containing an **S**, **D**, **R**, or **N**. Use **S** to give the preview window a single pixel frame. Use **D** to give the preview window a thick frame. Use **R** to give the preview window a thick but resizeable frame. Use **N** to give the preview window no frame under Windows 3.1 or a single pixel frame under Window 95/98. This parameter is optional.

icon — A string constant, variable, EQUATE, or expression containing an icon filename. By specifiying an icon file, a minimize button is automatically placed on the preview window. This parameter is optional.

systemmenu — An integer constant, variable, EQUATE, or expression that specifies whether the preview window will contain a system menu. A value of TRUE will give the preview window a system menu. A value of FALSE (the default value) will not include the system menu on the preview window. This parameter is optional.

maximizebox — An integer constant, variable, EQUATE, or expression that specifies whether the preview window will contain a maximize button. A value of TRUE (the default value) will place the maximize button on the preview window. A value of FALSE will not include the maximize box on the preview window. This parameter is optional.

3dflag — An integer constant, variable, EQUATE, or expression that specifies whether the preview window will have a 3D look. The 3D look provides the window with a gray backgound and chiseled control look. A value of TRUE (the default value) will provide the preview window with the 3D look. A value of FALSE will not provide the preview window with the 3d look. This parameter is optional.

The Preview method is used to preview a Crystal report within a Clarion window. This method supports several preview window options.

Example:

```
oCrystal8.Preview( 'My Report','I','R',,0,1,1 )
```

_Print (print a Crystal Report)

_Print(| *copies*, *printersetup* |)

_Print	Print a Crystal Report.
copies	An integer constant, variable, EQUATE, or expression that specifies the number of copies of the report to print. The default for this parameter is 1. This parameter is optional.
printersetup	An integer constant, variable, EQUATE, or expression that specifies whether the Printer Setup dialog is displayed before sending the report to the printer. Specifying TRUE or 1 for this parameter will cause the Printer Setup dialog to be displayed; a value of FALSE or 0 (the default value) will allow the report to go directly to the printer. This parameter is optional.

The _Print method prints a Crystal report directly to the printer without any option to preview the report. The printer setup dialog is optional before the report is sent to the printer.

Example:

```
oCrystal8._Print( 1, 1 )
```

Query (retrieve or set the SQL data query)

Query(| *querystring* |)

Query	Set or retrieve the SQL data query.
querystring	A string constant, variable, EQUATE, or expression containing the SQL query to be sent to the SQL data source. This parameter is optional.

The Query method is used to either get or set the SQL query. If the *querystring* is omitted from the method call, the current query is retrieved.

Return Data Type: STRING

Example:

```
formula = oCrystal8.Query()!retrieve query into formula variable
formula = '{{Customer.Country} in ["Australia"]' ! SQL query
oCrystal8.Query( formula )     ! Set the query
```

SelectionFormula (retrieve or set the Crystal formula)

SelectionFormula(| *formulastring* |)

SelectionFormula	Set or retrieve the Crystal formula.
Formulastring	A string constant, variable, EQUATE, or expression containing the Crystal formula. This parameter is optional.

The SelectionFormula method is used to either get or set the report's formula used to limit retrieved records. If the *formulastring* is omitted from the method call, the current formula is retrieved.

Return Data Type: STRING

Example:

```
formula = oCrystal8.SelectionFormula()!retrieve selection formula into formula v
formula = '{{Customer.Country} in ["Australia"]' ! SQL query
oCrystal8.SelectionFormula( formula )   ! Set the query
```

ShowDocumentTips (show tips on docuement in the preview window)

ShowDocumentTips(| *showdocumenttips* |)

ShowDocumentTips	Display tooltips in the document being previewed.
showdocumenttips	An integer constant, variable, EQUATE, or expression that specifies whether to enable tooltips on the document in the report preview window. A value of one (1) indicates that tooltips will be shown. A value of zero (0) indicates that tooltips will not be displayed on the document in the preview window. This is the default if the parameter is omitted.

The ShowDocumentTips method is used to enable tooltips on the document being previewed in the report preview window. This method returns a BYTE representing the value of showdocumenttips.

Return Data Type: BYTE

Example:

```
oCrystal8.ShowDocumentTips(1)
```

ShowReportControls (show print controls)

ShowReportControls (| *showreportcontrols* |)

ShowReportControls	Display tooltips in the document being previewed.
showreportcontrols	An integer constant, variable, EQUATE, or expression that specifies whether the print controls are displayed. A value of one (1) will cause the print controls to be displayed. A value of zero (0) indicates that will hide the print controls. This parameter is optional and defaults to TRUE if omitted.

The ShowReportControls method is used to display the print controls. The print controls include the First, Previous, Next, and Last Page buttons as well as the buttons for Cancel, Close, Export, and Print to Printer. This method returns a BYTE representing the value of *showreportcontrols*.

Return Data Type: BYTE

Example:

```
oCrystal8.ShowReportControls(1)
```

ShowToolbarTips (show tips on preview window toolbar)

ShowToolbarTips(| *showtooltips* |)

ShowToolbarTips	Display tooltips in the preview window's toolbar.
showtooltips	An integer constant, variable, EQUATE, or expression that specifies whether to enable tooltips on the toolbar in the report preview window. A value of one (1) indicates that tooltips will be shown. This is the default if the parameter is omitted. A value of zero (0) indicates that tooltips will not be displayed in the report preview window.

The ShowToolbarTips method is used to enable tooltips on the toolbar of the report preview window. This method returns a BYTE representing the value of *showtooltips*.

Return Data Type: BYTE

Example:

```
oCrystal8.ShowToolBarTips(1)
```

cwRTF Class

cwRTF Overview

Clarion's implementation of Rich Text Format (RTF) is derived from Microsoft's Rich Edit Control, version 3.0. Rich Text provides a storage format for text that keeps the text compatible among different operating systems, and software applications. A rich text control allows a user to enter, edit, format, print, and save text.

cwRTF Class Concepts

The features of Clarion's RTF control include the support for colorized text, fonts, font sizes, bold, italics, underlining, paragraph justification, bullets, undo, redo, cut, copy and paste clipboard functionality, search, print, new open and save to file, ruler, and tab settings.

Clarion's Rich Text support is compatible with both the ABC and Legacy templates. It may only be used in a 32-bit application. Multiple RTF controls may be used on a single window.

Clarion's Rich Text Classes and Templates are wrappers around Microsoft's Rich Edit Control DLL's. The presence of RichEdxx.DLL is required in the Windows/System directory. There are three versions of this DLL. The following list of operating systems shows which DLL each system installs and supports. Other programs may install a newer version of the Rich Edit DLL.

Windows NT/Windows 2000
: Microsoft® Windows NT® version 4.0 includes Rich Edit 1.0 and 2.0. Microsoft Windows® 2000 includes Rich Edit 3.0 with a Rich Edit 1.0 emulator.

Windows 98
: Windows 98 includes Rich Edit 1.0 and 2.0.

Windows 95
: Windows 95 includes only Rich Edit 1.0. However, Riched20.dll is compatible with Windows 95 and may be installed if an application that uses Rich Edit 2.0 has been installed.

cwRTF Relationship to Other Application Builder Classes

The cwRTF class works independantly of all other ABC classes.

cwRTF ABC Template Implementation

Once the cwRTF procedure template extension is added to a procedure, the templates instantiate a cwRTF object into the generated code for the procedure. This is also where the cwRTF object is initialized.

cwRTF Source Files

The cwRTF class declarations are installed by default to the Clarion \LIBSRC folder. The cwRTF component is distributed as a LIB/DLL, therefore the source code for the methods is not available. However, the methods are defined in this chapter and may be implemented in applications provided the required LIB/DLL is available at runtime.

C60RTF.INC	Rich Text Class Definition
C60RTFL.INC	Rich Text Class Definition Local Compile
C60RTF.dll	Rich Text DLL
C60RTF.lib	Rich Text LIB
C60RTFL.lib	Rich Text Local LIB

cwRTF Properties

cwRTF Properties

The cwRTF class contains many properties that although are not PRIVATE, should not be used. These methods are used internally.

hRTFWindow(RTF control handle)

hRTFWindow LONG

The **hRTFWindow** property is a handle to the RTF control.

cwRTF Methods

AlignParaCenter (center paragraph)

AlignParaCenter

The **AlignParaCenter** method is used to center the current or selected paragraph of text within the rich text control. The current paragraph is the one that the cursor is within.

Example:

```
oRTF_RTFTextBox.AlignParaCenter() !Center paragraph
```

AlignParaLeft (left justify paragraph)

AlignParaLeft

The **AlignParaLeft** method is used to left justify the current or selected paragraph of text within the rich text control. The current paragraph is the one that the cursor is within.

Example:

```
oRTF_RTFTextBox.AlignParaLeft() !Left justify paragraph
```

AlignParaRight (right justify paragraph)

AlignParaRight

The **AlignParaRight** method is used to right justify the current or selected paragraph of text within the rich text control. The current paragraph is the one that the cursor is within.

Example:

```
oRTF_RTFTextBox.AlignParaRight() !Right justify paragraph
```

ChangeFontStyle (set current font style)

ChangeFontStyle(*fontstyle***)**

ChangeFontStyle	Sets the current font style.
fontstyle	An integer constant, variable, EQUATE, or expression that contains a value that represents a fontstyle. Valid fontstyle equates can be found in EQUATES.CLW.

The **ChangeFontStyle** method is used to set the current font style. The style of a font represents the strike weight and style of the font.

Example:

```
oRTF_RTFTextBox.ChangeFontStyle(FONT:Italic )   !Font Style
oRTF_RTFTextBox.ChangeFontStyle(loc:fontstyle ) !Variable Font Style
```

CanRedo (check for redo data)

CanRedo

The **CanRedo** method is used to to see if there is data in the redo buffer. A return value of one (1 or True) indicates there is redo data in the buffer, a redo operation is available; a return value of zero (0 or False) is returned if there is no redo data in the buffer, a redo operation is not available.

Return Data Type: BYTE

Example:

```
loc:redo =oRTF_RTFTextBox.CanRedo() !Check for data in the Redo buffer
```

CanUndo (check for undo data)

CanUndo

The **CanUndo** method is used to to see if there is data in the undo buffer. A return value of one (1 or True) indicates there is undo data in the buffer, an undo operation is available; a return value of zero (0 or False) is returned if there is no undo data in the buffer, an undo operation is not available.

Return Data Type: BYTE

Example:

```
loc:undo =oRTF_RTFTextBox.CanUndo() !Check for data in the Undo buffer
```

Color (set text color)

Color

The **Color** method calls the Windows standard color choice dialog box in order to allow a user to choose a color. If text is selected prior to calling the color dialog, the selected text will be colored the selected color.

Example:

```
oRTF_RTFTextBox.Color()!Color text
```

Copy (copy selected text to clipboard)

Copy

The **Copy** method is used to copy selected text from the rich text control into the clipboard.

Example:

```
oRTF_RTFTextBox.Copy() !Copy text to clipboard
```

Cut (cut selected text)

Cut

The **Cut** method is used to cut the selected text from the rich text control into the clipboard.

Example:

```
oRTF_RTFTextBox.Cut() !Cut text to clipboard
```

Find (set current font style)

Find([*findtext***])**

Find	Search for text within the rich text field.
findtext	A string constant, variable, EQUATE, or expression containing the text for search for. If this is omitted the Find dialog is presented.

The **Find** method is used to search the Rich Text field for the text specified in *findtext*. If no findtext is specified, the Find dialog is presented. The user can type in the text to search for as well as specify other search options such as Whoe Words Only, Case Sensitive Search, and Search Direction (up or down).

This method returns a value indicating the character position where the text was found.

Return Data Type: LONG

Example:

```
loc:position =oRTF_RTFTextBox.Find(loc:find )  ! Search for contents of
loc:find
loc:position =oRTF_RTFTextBox.Find('mytext ' ) ! Search for 'mytext'
loc:position =oRTF_RTFTextBox.Find()           ! Show find dialog
```

FlatButtons (use flat button style)

FlatButtons(*buttonstatus***)**

FlatButtons	Set the FormatBar and Toolbar buttons to appear in a flat or raised mode.
buttonstatus	A numeric constant, variable, EQUATE, or expression that indicates whether to use flat or raised buttons. A TRUE valid is passed to the method to use flat buttons. A FLASE value is passed to the FlatButtons method to raised buttons.

The **FlatButtons** method is used to set the FormatBar and Toolbar buttons to appear in a flat or raised mode. A flat button remains flat until the mouse cursor passes over it.

Example:

```
oRTF_RTFTextBox.FlatButtons(1 ) !Flat buttons
oRTF_RTFTextBox.FlatButtons(0 ) !Raised buttons
```

Font (apply font attributes)

Font([*fontname***], [***fontsize***], [***fontcolor***], [***fontstyle***])**

Font	Apply font attributes to rich text.
fontname	A string constant or variable containing a font name.
fontsize	An integer constant containing the size (in points) of the font.
fontcolor	An integer constant containing the red, green, and blue values for the color of the font in the low-order three bytes, for an EQUATE for a standard Windows color value.
fontstyle	An integer constant, constant expression, or EQUATE specifying the strike weight and style of the font.

The **Font** method is used to set font attributes at the current insertion point or apply it to the currently selected text. If all of the parameters for this method are omitted the Windows standard font dialog box is called in order to allow a user to set standard font attributes.

Example:

```
!Using variables
oRTF_RTFTextBox.Font(FontName,FontSize,FontColor,FontStyle )
!Specific Font Attributes
oRTF_RTFTextBox.Font('Arial ',10,COLOR:Red,FONT:Underline )
!Font Dialog
oRTF_RTFTextBox.Font()
```

GetText (copy text to variable)

GetText(*text***, [***startpos***], [***endpos***])**

GetText	Copy indicated text to a variable.
text	A string variable that will receive the specified text. The highlighted text will be assigned to the variable if no starting and ending positions are specified. If positions are specified the text specified by these positions will be assigned to the string variable.
startpos	An integer constant or variable that specifies the starting character position to copy text from.
endpos	An integer constant or variable that specifies the ending character position to copy text from.

The **GetText** method is used to copy the specified text to a string or variable. The method can return a result that specifies the length (number of characters) of the copied text.

Return Data Type: LONG

Example:

```
oRTF_RTFTextBox.GetText(loc:find, ,)            !read text into loc:find
loc:length =oRTF_RTFTextBox.GetText(loc:find,,) !return string length

!read text into loc:find from specified position
oRTF_RTFTextBox.GetText(loc:find,10,20)
```

Init (initialize the cwRTF object)

Init(*window***,** *textbox***, [***rulerflag***], [***toolbarflag***], [***formatbarflag***])**

Init	Initialize the cwRTF object.
window	The label of the WINDOW that contains the rich text control.
textbox	A numeric constant, variable, EQUATE, or expression containing the control number (FEQ) of the rich text control.
rulerflag	A numeric constant, variable, EQUATE, or expression that indicates whether to initially display the RulerBar with the rich text control.
toolbarflag	A numeric constant, variable, EQUATE, or expression that indicates whether to initially display the ToolBar with the rich text control.
formatbarflag	A numeric constant, variable, EQUATE, or expression that indicates whether to initially display the FormatBar with the rich text control.

The **Init** method initializes the cwRTF object. This method also sets the initial states of the RulerBar, ToolBar, and FormatBar. By default all three bars are displayed.

Example:

```
oRTF_RTFTextBox.Init( Window, ?RTFTextBox, 1, 1, 1 )
```

IsDirty (indicates modified data)

IsDirty([***saveflag***]**)**

IsDirty	Determines if the data in the rich text control has been modified.
saveflag	A numeric constant, variable, EQUATE, or expression that indicates whether to prompt the user to save changes to the rich text field if the field has changed data. A one (1 or True) value signifies the user will be prompted. This is the default value. A zero (0 or False) value signifies the user will not be prompted to save the data.

The **IsDirty** method is used to determine if the text in the RTF control has changed. If the text has changed, the user can be prompted to save all changes. A one (1 or True) is returned if the data in the rich text control contains changes; a zero (0 or False) is returned if the data in the rich text control does not contain data changes.

Return Data Type: BYTE

Example:

```
loc:dirty =oRTF_RTFTextBox.IsDirty(1) !Prompt to save changes
loc:dirty =oRTF_RTFTextBox.IsDirty(0) !No prompt to save changes
```

Kill (shut down the csRTF object)

Kill([*isdirty*]**)**

Kill	Shut down the cwRTF object.
isdirty	A numeric constant, variable, EQUATE, or expression that indicates whether the rich text control's modified data should be saved to disk.

The **Kill** method shuts down the cwRTF object, releasing any memory allocated during the life of the obejct. Passing a one (1 or True) value to this method will force the modified data to be saved upon termination of the method; a value of zero (0 or False) will not save the modified data to the table.

Example:

```
oRTF_RTFTextBox.Kill( TRUE )
```

LeftIndent (indent the current or selected paragraph)

LeftIndent(*indentsize***)**

LeftIndent	Indent the current or selected paragraph.
indentsize	A REAL numeric constant, variable, or expression that indicates the number of inches to indent. A negative value will reverse the indent.

The **LeftIndent** method is used to indent the current or selected paragraph. The indentation size is specified in inches and may also be a negative number to reverse the indentation.

Example:

```
oRTF_RTFTextBox.LeftIndent(.5) !Indent 1/2 inch from left
```

LimitTextSize (limit amount of text)

LimitTextSize(*maxtextsize***)**

LimitTextSize	Limits the amount of text that can be placed in the rich text control regardless of the method used to save the data field or file.
maxtextsize	A numeric constant, variable, EQUATE, or expression that indicates the maximum number of characters allowed in the rich text field. This includes the rich text formatting characters.

The **LimitTextSize** method is used limit the number of text that can be placed in the rich text control regardless of the method used to save the data field or file. This method should be called before the rich text control is loaded.

Example:

```
oRTF_RTFTextBox.LimitTextSize(2000) !Limit text to 2000 characters
```

LoadField (load rich text data from field)

LoadField(*fieldname***)**

LoadField	Load the rich text control with the data contained in the field specified.
fieldname	The fully qualified label of a field to load the data from.

The **LoadField** method is used to load a string or memo rich text field into the rich text control.

Example:

```
oRTF_RTFTextBox.LoadField(let:letter ) !Load RTF field
```

LoadFile (load rich text data from file)

LoadFile(*filename***)**

LoadFile	Load the rich text control with the data contained in the file specified.
filename	A string constant, variable, EQUATE, or expression containing the .RTF filename. If no *filename* is specified, the Open file dialog is opened.

The **LoadFile** method is used to load a .RTF file into the rich text control.

Example:

```
oRTF_RTFTextBox.LoadField(let:letter ) !Load RTF field
```

NewFile (clear rich text data)

NewFile

The **NewFile** method is used to clear the contents of the rich text control.

Example:

```
oRTF_RTFTextBox.NewFile()
```

Offset (offset current or selected paragraph)

Offset(*offsetsize***)**

Offset	Offset the second and subsequent lines of a paragraph.
offsetsize	A REAL numeric constant, variable, or expression that indicates the number of inches to offset. A negative value will reverse the offset.

The **Offset** method is used to offset the second and subsequent lines of the current or selected paragraph. The *offsetsize* is specified in inches and may also be a negative number to reverse the offset.

Example:

```
oRTF_RTFTextBox.Offset(1 ) !Offset by 1 inch
```

PageSetup (set page attributes)

PageSetup

The **PageSetup** method calls the Windows standard page setup dialog box. This dialog allows the setting of the paper size and source, orientation, margins and printer selection and defaults.

Example:

```
oRTF_RTFTextBox.PageSetup()
```

ParaBulletsOff (turn off paragraph bullets)

ParaBulletsOff

The **ParaBulletsOff** method is used turn off bullets for the current or selected paragraph. The current paragraph is the one that the cursor is within.

Example:

```
oRTF_RTFTextBox.ParaBulletsOff() !Turn bullets off
```

ParaBulletsOn (turn on paragraph bullets)

ParaBulletsOn(*bulletstyle***)**

ParaBulletsOn	Turn on paragraph bullets.
bulletstyle	A numeric constant, variable, EQUATE, or expression that identifies the bullet style. Bullet styles are defined in C60RTF.INC.

The **ParaBulletsOn** method is used turn on bullets for the current or selected paragraph. The current paragraph is the one that the cursor is within.

Supported bullet styles are:

Bullets:On (•)
Bullets:Arabic (1, 2, 3,...)
Bullets:LowerLetters (a, b, c,...)
Bullets:UpperLetters (A, B, C,...)
Bullets:LowerRoman (i, ii, iii,...)
Bullets:UpperRoman (I, II, III,...)

Example:

```
oRTF_RTFTextBox.ParaBulletsOn(BULLET:On) !Turn bullets on
```

Paste (paste text from clipboard)

Paste

The **Paste** method is used to paste clipboard text into the rich text control .

Example:

```
oRTF_RTFTextBox.Paste() !Paste text to clipboard
```

_Print (print rich text control contents)

_Print(*showsetup***, [***jobtitle***])**

_Print	Print rich text control data.
showsetup	A numeric constant, variable, EQUATE, or expression that determines whether to show the Windows Print Setup dialog.
jobtitle	A string constant or variable containing a title of the job being printed. The job title is seen from the print spooler. If no job title is specified, the default job title is 'Untitled'. If the Print icon is used from the toolbar, the job title is set to 'RTF Data'.

The **_Print** method is used to simply print the rich text data.

If the PageSetup dialog is used, the method will return a one (1 or True) value if the OK button on the dialog is pressed. A zero (0 or False) is returned if the Cancel button on the Page Seup dialog is pressed. If the Page Setup dialog is not used, a one (1 or True) is returned.

Return Data Type: BYTE

Example:

```
oRTF_RTFTextBox._Print(1 )           !Show Print Setup dialog before printing
oRTF_RTFTextBox._Print(0 )           !Do not show Print Setup dialog
oRTF_RTFTextBox._Print(0, 'JobTitle' )         !Do not show Print Setup dialog
status = oRTF_RTFTextBox._Print(1, 'JobTitle' )!Do not show Print Setup dialog
```

Redo (reapply action)

Redo

The **Redo** method is used to reapply the action that was previously undone on the rich text control. Redo can be used on the previous 100 actions.

Example:

```
oRTF_RTFTextBox.Redo() !Redo previous undo action to rich text control
```

Replace (find and replace search)

Replace([*findtext***], [***replacetext***])**

Replace	Search for text within the rich text field.
findtext	A string constant, variable, EQUATE, or expression containing the text for search for. If this is omitted the Find dialog is presented.
replacetext	A string constant, variable, EQUATE, or expression containing the text for search for. If this is omitted the Find dialog is presented.

The **Replace** method is used to do a Find and Replace search option within the rich text control. If the *findtext* and *replacetext* parameters are omitted the Find and Replace dialog will appear.

This method returns a value indicating the number of applied replaces.

Return Data Type: LONG

Example:

```
!Using Variables
loc:replace =oRTF_RTFTextBox.Replace(loc:find,loc:replace )
!Replace dialog
loc:replace =oRTF_RTFTextBox.Replace()
```

ResizeControls (used internally)

The **ResizeControls** method is used internally and should not be called otherwise.

RightIndent (indent the current or selected paragraph)

RightIndent(*indentsize***)**

RightIndent	Indent the current or selected paragraph.
indentsize	A REAL numeric constant, variable, or expression that indicates the number of inches to indent. A negative value will reverse the indent.

The **RightIndent** method is used to indent the current or selected paragraph from the right side of the rich text control. The indentation size is specified in inches and may also be a negative number to reverse the indentation.

Example:

```
oRTF_RTFTextBox.RightIndent(.5) !Indent 1/2 inch from right
```

SaveField (save rich text data to field)

SaveField(*fieldname***)**

SaveField	Save the rich text control data to the field specified.
fieldname	The fully qualified label of a field to save to.

The **SaveField** method is used to save rich text data into a table field.

Example:

```
oRTF_RTFTextBox.SaveField(let:letter )
```

SaveFile (save rich text data to file)

SaveFile(*filename***)**

SaveFile	Save the rich text data to the file specified.
filename	A string constant, variable, EQUATE, or expression containing the .RTF filename to save the data to.

The **SaveFile** method is used to save rich text data to a .RTF file.

Example:

```
oRTF_RTFTextBox.SaveFile(loc:Filename )
oRTF_RTFTextBox.SaveFile('0101SS.RTF ' )
```

SelectText (select characters)

SelectText(*startpos***, *endpos***)**

GetText	Select a specific set of characters by character position.
startpos	An integer constant or variable that specifies the starting character position to select text from.
endpos	An integer constant or variable that specifies the ending character position to select text from.

The **SelectText** method is used select a specific set of characters by character position. The text is highlighted when it is selected.

Example:

```
!Select text from position 1 to 20
oRTF_RTFTextBox.SelectText(1,20 )
!Select text from variable positions
oRTF_RTFTextBox.SelectText(loc:startpos,loc:endpos )
```

SetDirtyFlag (set modified flag)

SetDirtyFlag(*status***)**

SetDirtyFlag	Sets the modified flag for the rich text control
status	A numeric constant, variable, EQUATE, or expression that indicates whether to set or clear the dirty flag. A one (1 or True) sets the flag; a zero (0 or False) claers the flag.

The **SetDirtyFlag** method is used to set or clear the modified flag for the rich text control. This can be used to clear the flag so the user is not prompted to save data.

Example:

```
oRTF_RTFTextBox.SetDirtyFlag( 0)  ! Clear dirty flag
```

SetFocus (give rich text control focus)

SetFocus

The **SetFocus** method is used to give the rich text control focus.

Example:

```
oRTF_RTFTextBox.SetFocus
```

SetText (place text into rich text control)

SetText(*text***, [***allowundo***], [***startpos***], [***endpos***])**

SetText	Place indicated text into rich text control.
text	A string constant or variable containing the text to place in the rich text control.
allowundo	A numeric constant, variable, EQUATE, or expression that determines whether the placement of text action is saved into the undo buffer. This allows the undo method to be called for this action. A one (1 or True) allows an undo for this action; a zero (0 or False) does not allow an undo for this action. The default value is False.
startpos	An integer constant or variable that specifies the starting character position to place the text to.
endpos	An integer constant or variable that specifies the ending character position to to place the text to.

The **SetText** method is used to place the text to a specified position within the a rich text control. The text to place comes from the specified string or variable. If the start and end positions are not available the current cursor position is used.

Example:

```
oRTF_RTFTextBox.SetText(loc:find,0,) !place text at current position
oRTF_RTFTextBox.SetText(loc:find,10,20) !place text at specified position
```

ShowControl (hide/unhide RTF control)

ShowControl(*showstate***)**

ShowControl	Hide/Unhide RTF control
showstate	A numeric constant, variable, EQUATE, or expression that indicates whether the RTF control is displayed or hidden. A one (1 or True) unhides the control; a zero (0 or False) hides the control.

The **ShowControl** method is used hide or unhide the RTF control. When hidden, the ruler bar is also hidden.

Example:

```
oRTF_RTFTextBox.ShowControl( 0 ) ! Hide control
oRTF_RTFTextBox.ShowControl( 1 ) ! Unhide control
```

Undo (undo action)

Undo

The **Undo** method is used to undo (reverse) the action previously taken on the rich text control.

Example:

```
oRTF_RTFTextBox.Undo()!Undo previous change to rich text control
```

DbAuditManager

DbAuditManager Overview

The DbAuditManager class declares an audit manager that consistently handles all database auditing operations. This class provides methods that create and update an audit log file.

Relationship to Other Application Builder Classes

The DbAuditManager class uses the DbFileManager to handle the opening of the log file. This also takes care of any errors that may occur when opening the file. The DbAuditManager class uses the DbChangeManager class to update the audit log file.

This class also implements the DbdChangeAudit interface. This interface aids in the update of the log file.

DbAuditManager ABC Template Implementation

The DbAuditManager class is used in an application when the Global Database Auditing extension is added to the application. The ABC Templates instantiate the DbAuditManager class in the global module of the application where the class is also initialized.

The DbAuditManager class implements the IDbdChangeAudit interface.

DbAuditManager Source Files

The DbAuditManager source code is installed by default to the Clarion \LIBSRC folder. The specific DbAuditManager source code and their respective components are contained in:

ABFILE.INC	DbAuditManager declarations
ABFILE.CLW	DbAuditManager method definitions

DbAuditManager Properties

The DbAuditManager contains the following properties:

Action (log file action column)

Action STRING(20)

The **Action** property contains a string that is used to update the Action column in the audit log file. The action column show the type of update that was performed on the data file.

Implementation: The Action property is set by the OnInsert, OnDelete, OnChange, and BeforeChange methods. It is used to update the log file by the AddLogFile method.

See Also: OnInsert, OnDelete, OnChange, and BeforeChange, AddLogFile

ColumnInfo (log file column queue)

ColumnInfo &DbColumnQueue, PROTECTED

The **ColumnInfo** property is a reference to a structure that is the source of the data that is added to the audit log file.

Implementation: The ColumnInfo queue is initialized by the Init method and updated by the AddItem method.

See Also: AddItem, AppendLog, CreateHeader, Init, Kill

LogFiles (log file queue)

LogFiles &LogFileQueue, PROTECTED

The **LogFiles** property is a reference to a structure that keeps track of all audit log files.

Implementation: The LogFiles queue is initialized by the Init method and updated by the AddLogFile method.

See Also: AddLogFile, Init, Kill, SetFm, OpenLogFile

FM (DbLogFileManager object)

LFM &DbLogFileManager, PROTECTED

The **LFM** property is a reference to the DbLogFileManager object that creates and opens the various audit log files.

Implementation: The LFM property is intialized in the Init method.

See Also: AppendLog, CreateHeader, Init, Kill, OpenLogFile

Errors (ErrorClass object)

Errors &ErrorClass, PROTECTED

The Errors property is a reference to the ErrorClass object that handles unexpected conditions for the DbAuditManager. In an ABC Template enerated program, the ErroClass object is called GlobaErros by default.

Implementation: The Init method initializes the Errors property.

See Also: Init, OpenLogFile

DbAuditManager Methods

The DbAuditManager class contains the following methods:

AddItem (maintain the columninfo structure)

AddItem(*filename***,** *fieldname***,** *field***,** *fieldheader***,** *fieldpicture***)**

AddItem	Adds fields to the columninfo structure so they can be monitored in the audit log file.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
fieldname	A string constant, variable, EQUATE, or expression containing the label of the field that is to be audited.
field	The fully qualified label for the FILE field.
fieldheader	A string constant, variable, EQUATE, or expression containing the field header (title) field that is to be audited. This is the column header that will appear in the audit log file.
fieldpicture	A string constant, variable, EQUATE, or expression containing the picture of the field that is to be audited. This defines how the column in the audit log file will be formatted.

The **AddItem** method maintains the ColumnInfo queue by updating it with field information needed to create and update the log file.

Implementation: This method is called one time for each field that will appear in the log file. There is one extra column that always appears in the log file. This is the action column that defines the update action that occurred to cause the log file update.

See Also: AddLogFile

AddLogFile (maintain log file structure)

AddLogFile(*filename***,** *logfilename***)**

AddLogFile	Maintain the log file queue.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
logfilename	A string constant, variable, EQUATE, or expression containing the audit log file name.

The **AddLogFile** method maintains the LogFiles structure in order to keep track of each log file and its associated data file.

Implementation: In template generated code, the AddLogFile method is called after the DbAuditManager object is initialized. This method should be a called once for each file being auditied.

AppendLog (initiate audit log file update)

AppendLog(*filename***)**

AppendLog	Initiate audit log file update.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.

The **AppendLog** method initiates the audit log file update by retrieving the field information and setting the date and time of the update. This information is added to the log file by the FileManager.

See Also: LFM

BeforeChange (update audit log file before file change)

BeforeChange(*filename***,** *BFP***), VIRTUAL**

BeforeChange	
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
BFP	The label of a BufferedPairsClass object. See *BufferedPairsClass* for more information.

The **BeforeChange** method saves the values of the record before a change is made. These values are used for comparison after the record is saved back to disk.

Implementation: The BeforeChange method sets the Action property and saves the current field values to the log file. This method is called from the DbChangeManager.CheckChanges method.

See Also: BufferedPairsClass, DbChangeManager.CheckChanges

CreateHeader (create log file header records)

CreateHeader(*filename***,** *LFM***), VIRTUAL**

CreateHeader	Create the header records in the audit log file.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
LFM	The label of the log file's DbLogFileManager object.

The **CreateHeader** method updates the audit log file just after file creation. It adds header records to the log file which serve as column heading information. The header includes the Date, Time, Action, and Field header.

Implementation: The CreateHeader method is called by the OpenLogFile method.

See Also: OpenLogFile

Init (initialize the DbAuditManager object)

Init(*error handler***), VIRTUAL**

Init	Initializes the DbAuditManager object
error handler	The label of an ErrorClass object. See *Error Class* for more information.

The **Init** method initializes the DbAuditManager object. The *error handler* object, ColumnInfo, LogFiles, and LFM properties are initialized at this time.

Implementation: In template generated code, the Init method is called in the main application module. It is called with the GlobalErrors error handler.

Kill (shut down DbAuditManger object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and does any other required termination code.

Implementation: The Kill method frees memory allocated to the ColumnInfo, LogFiles, and LFM properties.

OnChange (update audit log file after a record change)

OnChange(*filename***,** *file***), VIRTUAL**

OnChange	Initiates an update to the audit log file after a Change to the file.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
file	The label of the FILE being auditied.

The **OnChange** method initiates the update to the audit log file after a Change action.

Implementation: The OnChange method sets the Action property and calls the AppendLog method. This method is called from the DbChangeManager.CheckChanges method.

See Also: DbChangeManager.CheckChanges

OnDelete (update audit log file when a record is deleted)

OnDelete(*filename***,** *file***), VIRTUAL**

OnDelete	Initiates an update the audit log file on a Delete action.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
file	The label of the FILE being auditied.

The **OnDelete** method initiates the update to the audit log file on a Delete action.

Implementation: The OnDelete method sets the Action property and calls the AppendLog method. This method is called from the RelationManager's Delete method.

See Also: RelationManager.Delete

OnFieldChange (virtual method for each field change)

OnFieldChange(l*eft***,** *right***,** *fieldname***,** *filename***), VIRTUAL**

OnFieldChange	Manage field changes.
left	The label of the "left" field of the pair that contains the original value of the field being updated. The field may be any data type, but may not be an array.
right	The label of the "right" field of the pair that contains the new value of the field being updated. The field may be any data type, but may not be an array.
fieldname	A string constant, variable, EQUATE, or expression containing the label of the field that is to be audited.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **OnFieldChange** method is called for each field in the record that has changed. The before and after values are passed to this method.

Implementation: **OnFieldChange** is a VIRTUAL method so that other base class methods can directly call the OnFieldChange virtual method in a derived class. This lets you easily implement your own custom version of this method.

See Also: DbChangeManager.CheckPair

OnInsert (update audit log file when a record is added)

OnInsert(*filename***,** *file***), VIRTUAL**

OnInsert	Initiates an update the audit log file on an Insert action.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
file	The label of the FILE being auditied.

The **OnInsert** method initiates the update to the audit log file on an Insert action.

Implementation: The OnInsert method sets the Action property and calls the AppendLog method. This method is called from the FileManager's Insert method.

See Also: FileManager.Insert

OpenLogFile (open the audit log file)

OpenLogFile(*filename***), PROTECTED**

OpenLogFile	Opens the audit log file.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **OpenLogFile** method opens the audit log file that is to be updated. If the log file does not already exist, the file is created and the headers are added to it.

Implementation: This method is called by the AppendLog method to ensure the log file exists before trying to update it.

See Also: AppendLog, DbLogFileManager class

SetFM (determine log file status)

SetFM(*filename***), PROTECTED**

SetFM	Determines log file status.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **SetFM** method is used to determine if the log file has been initialized by the AddLogFile method.

A one (1 or True) value is returned if the log file has been correctly initialized into the LogFiles structure; a zero (0 or False) is returned otherwise.

Implementation: The SetFM method is called by the AddItem and AppendLog methods.

Return Data Type: BYTE

See Also: AddItem, AppendLog

DbChangeManager

DbChangeManager Overview

The DbChangeManager class declares an audit manager that consistently handles all database change operations.

Relationship to Other Application Builder Classes

The DbChangeManager class works in conjunctions with the DbAuditManager class and the IDbChangeManager interface.

DbChangeManager ABC Template Implementation

The DbChangeManager class is used in an application when the Global Database Auditing extension is added to the application. The ABC Templates instantiate the DbChangeManager class in the global module of the application where the class is also initialized.

DbChangeManager Source Files

The DbChangeManager source code is installed by default to the Clarion \LIBSRC folder. The specific DbChangeManager source code and their respective components are contained in:

ABFILE.INC	DbChangeManager declarations
ABFILE.CLW	DbChangeManager method definitions

DbChangeManager Properties

The DbChangeManager contains the following properties:

NameQueue (pointer into trigger queue)

NameQueue &DbNameQueue, PROTECTED

The **NameQueue** property keeps track of the file and field names when a change is made to a file that is being audited. The NameQueue queue entry also points into the trigger queue for the change data.

Implementation: The NameQueue structure is updated in the DbChangeManager.AddItem method. This queue contains a pointer into the TriggerQueue.

See Also: DbChangeManager.Init, DbChangeManager.Kill, DbChangeManager.AddItem, DbChangeManager.CheckPair

TriggerQueue (pointer to BFP for field changes)

TriggerQueue &DbTriggerQueue, PROTECTED

The **TriggerQueue** property contains the field change information by managing the BufferFieldPairs structure.

DbChangeManager Methods

The DbChangeManager class contains the following methods:

AddItem (maintain the namequeue structure)

AddItem(*left***,** *name***,** *filename***)**

AddItem	Maintains the namequeue structure.
left	The label of the "left" field of the pair that contains the original value of the field being updated. The field may be any data type, but may not be an array.
name	A string constant, variable, EQUATE, or expression containing the label of the field that is to be audited.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **AddItem** method maintains the NameQueue structure by updating it with field information needed to track before and after file changes.

Implementation: This method is called one time for each field that will appear in the log file.

AddThread (maintains the triggerqueue)

AddThread(*filename***)**

AddThread	Maintains the TriggerQueue.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **AddThread** method maintains the TriggerQueue by updating it with the current thread number and an instance of the BufferedPairsClass.

CheckChanges(check record for changes)

CheckChanges(*filename***,** *file***)**

CheckChanges	Checks the record for changes.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.
file	The label of the FILE being auditied.

The **CheckChanges** method checks to see if there were any changes made to the columns in the audited file. This method calls the CheckPairs method to compare the before and after field values of the audited file.

See Also: DbChangeManagerBeforeChange, IDbChangeManagerOnChange, DbChangeManager.CheckPair

CheckPair(check field pairs for changes)

CheckPair(*FP***)**

CheckPairs	Checks fields for changes.
FP	The label of a FieldPairsClass object. See *FieldPairsClass* for more information.

The **CheckPair** method compares the before and after values of a field to see if there were changes made. This is needed to know whether to update the audit log file.

Equal(checks for equal before and after values)

Equal(*filename***)**

Equal	Compares before and after values of fields.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **Equal** method returns one (1) if all pairs are equal and returns zero (0) if any pairs are not equal.

Implementation: The Equal method simply calls FieldPairsClass.Equat method which calls the FieldPairsClass.EqualLeftRight method which in turn does all the comparison work.

Return Data Type: BYTE

See Also: FieldPairsClass.Equal

Init (initialize the DbChangeManager object)

Init(*IDBC***), VIRTUAL**

Init	Initializes the DbChangeManager object
IDBC	The label of an IDbChangeManager interface. See *IDbChangeManager* for more information.

The **Init** method initializes the DbChangeManager object. The *TriggerQueue* and *NameQueue* are also initialized at this time.

Implementation: In template generated code, the Init method is called in the main application module.

Kill (shut down DbChangeManger object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and does any other required termination code.

Implementation: The Kill method frees memory allocated to the NameQueue and TriggerQueue structures.

SetThread (read triggerqueue)

SetThread(*filename***)**

SetThread	Reads the TriggerQueue for the specified file and current thread.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **SetThread** method reads the TriggerQueue for the specified file and current thread. If a matching entry is found in the queue a one (1 or True) is returned; if an entry is not found in the TriggerQueue a zero (0 or False) is returned.

Return Data Type: BYTE

Update (update the audit log file buffer)

Update(*filename***)**

Update

filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **Update** method calls the BufferFieldPairs class to update the record buffer with the changes made in order for the audit log file to be updated with the before and after values.

See Also: BFP.AssignLeftToRight

DbLogFileManager

DbLogFileManager Overview

The DbLogFileManager class declares a file manager that consistently handles the routine database operations on the audit log file. The DbLogFileManager is derived from the FileManager class.

Relationship to Other Application Builder Classes

The DbLogFileManager class is derived from the FileManager class. This class inherits all FileManager class properties and methods. The DbLogFileManager also relies on the ErrorClass for most of its error handling.

DbLogFileManager ABC Template Implementation

The DbLogFileManager class is instantiated by the DbAuditManager LFM property in the DbAuditManager.Init method.

DbLogFileManager Source Files

The DbLogFileManager source code is installed by default to the Clarion \LIBSRC folder. The specific DbLogFileManager source code and their respective components are contained in:

ABFILE.INC	DbLogFileManager declarations
ABFILE.CLW	DbLogFileManager method definitions

DbLogFileManager Properties

DbLogFileManager Properties

The DbLogFileManager inherits all the properties of the FileManager class from which it is derived. See FileManager Properties for more information.

In addition to the inherited properties, the DbLogFileManager contains the following properties:

Opened (file opened flag)

Opened BYTE

The **Opened** property indicates whether the DbLogFileManager's FILE (the log file) has been opened. A value of one (1 or True) indicates the FILE is open; a value of zero (0 or False) indicates the FILE is not opened.

DbLogFileManager Methods

DbLogFileManager Methods

The DbLogFileManager inherits all the methods of the FileManager class from which it is derived. See FileManager Methods for more information.

In addition to the inherited methods, the DbLogFileManager contains the following methods:

Init (initialize the DbLogFileManager object)

Init(*errorclass***,** *logfilename***), VIRTUAL**

Init	Initializes the DbAuditManager object
errorclass	The label of an ErrorClass object. See *Error Class* for more information.
logfilename	A string constant, variable, EQUATE, or expression that contains the audit log file name.

The **Init** method initializes the DbLogFileManager object.

EditClass

EditClass Overview

The EditClass lets you implement a dynamic edit-in-place control for each column in a LIST. The EditClass is an abstract class--it is not useful by itself, but serves as the foundation and framework for its derived classes. See *EditCheckClass, EditColorClass, EditFileClass, EditDropListClass, EditFontClass,* and *EditMultiSelectClass*.

EditClass Concepts

The EditClass creates an input control (CHECK, ENTRY, SPIN, COMBO, etc.), accepts input from the end user, then returns the input to a specified variable, typically the variable associated with a specific LIST cell--a field in the LIST control's data source QUEUE. The EditClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditClass provides virtual methods (TakeEvent) to allow you to take control of significant edit-in-place events.

The BrowseClass (AskRecord method) uses the EditClass to accomplish edit-in-place data entry by assigning the EditClass input control to a specific LIST cell--see *BrowseClass.AskRecord*.

Relationship to Other Application Builder Classes

Derived Classes

The EditClass serves as the foundation and framework for its derived classes. See *EditCheckClass, EditColorClass, EditEntryClass, EditFileClass, EditFileDropClass, EditFontClass,* and *EditMultiSelectClass*. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to this chapter's specification; however, the EditClass may be called by non-BrowseClass procedures and objects.

The BrowseClass.AskProcedure property indicates whether the BrowseClass object uses the EditClass for updates.

The BrowseClass.AskRecord method is the engine for the edit-in-place functionality. This method uses the EditClass to dynamically create the Edit-in-place control upon request (Insert, Change, or Delete) by the end user. When the end user moves off the edited record (enter key, click on another item) the AskRecord method saves or deletes the record and uses the EditClass to destroy the Edit-in-place control.

ABC Template Implementation

The BrowseUpdateButtons template generates references to EditClass objects as needed. One check box on the BrowseUpdateButtons control template enables default edit-in-place support for a given BrowseBox--any associated Form (update) procedure then becomes redundant.

If you accept the BrowseUpdateButtons default edit-in-place behavior, the generated code does not reference the EditClass, because the default edit-in-place behavior is implemented in the BrowseClass (see BrowseClass.AskRecord), and no additional generated code is needed.

If you use custom (**Configure EditInPlace**) edit-in-place behavior, the BrowseUpdateButtons template generates the code to instantiate the requested object (derived from the EditClass) and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditClass object's methods as needed. See *Control Templates--BrowseUpdateButton*s for more information.

EditClass Source Files

The EditClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditClass source code and their respective components are contained in:

ABEIP.INC	EditClass declarations
ABEIP.CLW	EditClass method definitions
ABEIP.TRN	EditClass translation strings

EditClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate several EditClass objects and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, icon, etc.), then edits the list items with a variety of edit-in-place objects. Note that the BrowseClass object calls the "registered" EditClass objects' methods as needed.

```
   PROGRAM
_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)
   INCLUDE('ABWINDOW.INC')     !declare WindowManager
   INCLUDE('ABBROWSE.INC')     !declare BrowseClass
   INCLUDE('ABEIP.INC')        !declare Edit-in-place classes
   MAP
   END

Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey    KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
IconFile     STRING(30)
ControlType  STRING(12)
            END
           END
PropView   VIEW(Property)
           END

PropQ     QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:ControlType LIKE(PR:ControlType)
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)
ViewPosition   STRING(1024)
          END

PropWindow WINDOW('Browse Field Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
            LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
            FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
            '60L(2)|_M~Control Type~@s12@' &|
            '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@]|M')
            BUTTON('&Insert'),AT(169,121),USE(?Insert)
            BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
            BUTTON('&Delete'),AT(267,121),USE(?Delete)
           END
```

```
Edit:PR:FieldName  EditEntryClass     !declare Edit:PR:FieldName-EIP ENTRY control

Edit:PR:Color CLASS(EditColorClass)   !declare Edit:PR:Color-EIP color dialog
Init           PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
              END


Edit:PR:Hide CLASS(EditCheckClass) !declare Edit:PR:Color-EIP CHECK control
Init         PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
             END
Edit:PR:IconFile CLASS(EditFileClass)!declare Edit:PR:IconFile-EIP file dialog
Init              PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
                  END

Edit:PR:ControlType CLASS(EditDropListClass) !declare Edit:PR:ContolType-EIP droplist
Init         PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
                    END

ThisWindow CLASS(WindowManager)
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
           END

BRW1       CLASS(BrowseClass)  !declare BRW1, the BrowseClass object
Q           &PropQ             ! that drives the EditClass objects--
           END                 ! i.e. calls Init, TakeEvent, Kill

GlobalErrors    ErrorClass
Access:Property CLASS(FileManager)
Init          PROCEDURE
                END

Relate:Property  CLASS(RelationManager)
Init              PROCEDURE
Kill              PROCEDURE,VIRTUAL
                 END
GlobalRequest    BYTE(0),THREAD
GlobalResponse   BYTE(0),THREAD
VCRRequest       LONG(0),THREAD
 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill
```

```
ThisWindow.Init PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
 ?PropList{PROP:LineHeight}=12   !enlarge rows to accomodate EditClass icons
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  BRW1.AddEditControl(Edit:PR:FieldName,1)  !Register Edit:PR:FieldName with BRW1
  BRW1.AddEditControl(Edit:PR:Color,2)      !Register Edit:PR:Color with BRW1
  BRW1.AddEditControl(Edit:PR:ControlType,3)!Register Edit:PR:ControlType with BRW1
  BRW1.AddEditControl(Edit:PR:Hide,4)       !Register Edit:PR:Hide with BRW1
  BRW1.AddEditControl(Edit:PR:IconFile,5)   !Register Edit:PR:IconFile with BRW1
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:Color.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SELF.Title='Select field color'   !set EIP color dialog title

Edit:PR:Hide.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)

 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
```

```
 SELF.Feq{PROP:Text}='Hide '     !set EIP check box text
 SELF.Feq{PROP:Value,1}='Y'      !set EIP check box true value
 SELF.Feq{PROP:Value,2}='N'      !set EIP check box false value

Edit:PR:IconFile.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
  CODE
  PARENT.Init(FieldNumber,ListBox,UseVar)
  SELF.Title='Select icon file'             !set EIP file dialog title
  SELF.FilePattern='Icon files *.ico|*.ico' !set EIP file dialog file masks
  SELF.FileMask=FILE:KeepDir+FILE:LongName  !set EIP file dialog behavior flag

Edit:PR:ControlType.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SELF.Feq{PROP:From}='ENTRY|SPIN|TEXT|STRING'  !set ControlType droplist
choices

Access:Property.Init PROCEDURE     !initialize FileManager
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)

Relate:Property.Init PROCEDURE     !initialize RelationManager
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)

Relate:Property.Kill PROCEDURE     !shut down RelationManager
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditClass Properties

The EditClass contains the following properties.

FEQ (the edit-in-place control number)

FEQ UNSIGNED

The **FEQ** property contains the control number of the edit-in-place control.

The CreateControl method sets the value of the FEQ property when it creates the control.

See Also: CreateControl

ReadOnly (edit-in-place control is read-only)

ReadOnly BYTE

The **ReadOnly** property is a flag indicating that the edit-in-place control is not editable.

See Also: SetReadOnly

EditClass Methods

Functional Organization--Expected Use

As an aid to understanding the EditClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[v]	initialize the EditClass object
Kill [v]	shut down the EditClass object

Mainstream Use:

TakeEvent[v]	handle events for the edit control

Occasional Use:

CreateContol[v]	a virtual to create the edit control
SetAlerts[v]	alert appropriate keystrokes for the edit control

[v] These methods are also virtual.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init	initialize the EditClass object
CreateContol	a virtual to create the edit control
SetAlerts	alert appropriate keystrokes for the edit control
TakeAccpted	handle accepted events for the edit control
TakeEvent[v]	handle events for the edit control
Kill	shut down the EditClass object

CreateControl (a virtual to create the edit control)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method is a virtual placeholder to create the appropriate window control for derived classes.

Implementation: The Init method calls the CreateControl method. The CreateControl method must set the value of the FEQ property.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditCheckClass.CreateControl, EditColorClass.CreateControl, EditEntryClass.CreateControl, EditFileClass.CreateControl, EditDropListClass.CreateControl, EditMultiSelectClass.CreateControl

Init (initialize the EditClass object)

Init(*column*, *listbox, editedfield* **), VIRTUAL**

Init	Initializes the EditClass object.
column	An integer constant, variable, EQUATE, or expression that contains the edited column number of the *listbox*.
listbox	An integer constant, variable, EQUATE, or expression that contains the control number of the edited LIST control--typically a BrowseClass object's LIST.
editedfield	The fully qualifiedlabel of the edited field--typically a field in the BrowseClass object's QUEUE.

The **Init** method initializes the EditClass object.

Implementation: The BrowseClass.AskRecord method calls the Init method. The Init method creates the edit-in-place control, loads it with the selected list item's data, and alerts the appropriate edit-in-place navigation keys.

Example:

```
MyEditClass.Init(1,?MyList,StateQ:StateCode)    !initialize EditClass object
!program code
MyEditClass.Kill                                !shut down EditClass object
```

See Also: BrowseClass.AskRecord

Kill (shut down the EditClass object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code. The Kill method must leave the object in an Initable state.

Implementation: The BrowseClass.AskRecord method calls the Kill method. The Kill method destroys the edit-in-place control created by the Init method.

Example:

```
MyEditClass.Init(1,?MyList,StateQ:StateCode)    !initialize EditClass object
!program code
MyEditClass.Kill                  !shut down EditClass object
```

See Also: BrowseClass.AskRecord

SetAlerts (alert keystrokes for the edit control)

SetAlerts, VIRTUAL

The **SetAlerts** method method alerts appropriate keystrokes for the edit-in-place control.

Implementation: The Init method calls the CreateControl method to create the input control and set the FEQ property. The Init method then calls the SetAlerts method to alert standard edit-in-place keystrokes for the edit control. Alerted keys are:

TabKey	!next field
ShiftTab	!previous field
EnterKey	!complete and save
EscKey	!complete and cancel
DownKey	!complete and save, then edit next row
UpKey	!complete and save, then edit prior row

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: Init

SetReadOnly (set edit control to read-only)

SetReadOnly(*state*), VIRTUAL

SetReadOnly	The **SetReadOnly** method places the edit-in-place control in a read-only state.
state	An integer constant, variable, EQUATE, or expression that indicates whether to disable a droplist control's dropdown button. A value of one (1 or True) disables the button. A value of zero (0 or False) has no effect on the control.

Implementation: The SetReadOnly method uses PROP:ReadOnly to place the edit-in-place conrol in a read-only state. After the parent call in the Init method of the EditInPlace object is the recommended place to call SetReadonly.

Example:

```
EditInPlace::CUS:Number.SetReadOnly()
```

See Also: ReadOnly, EditDropListClass.SetReadOnly

TakeAccepted (validate EIP field)

TakeAccepted (*Action*), VIRTUAL

The **TakeAccepted** method processes the accepted EIP field value and returns a value indicating whether to continue editing or to complete the field. If the EIPManager Class attribute SELF.REQ is TRUE, the field will be required, and the row can not be accepted if the field is blank. If the TakeAccepted method returns the EditAction:Cancel equate, the EIP wil remain on the current field.

Return Data Type: BYTE

See Also: EIPManager.TakeAcceptAll

TakeEvent (process edit-in-place events)

TakeEvent(*event* **), VIRTUAL**

TakeEvent	Processes an event for the EditClass object.
event	An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the EditClass object and returns a value indicating the user requested action. Valid actions are none, complete or OK, cancel, next record, previous record, next field, and previous field.

Implementation: The BrowseClass.AskRecord method calls the TakeEvent method. The TakeEvent method process an EVENT:AlertKey for the edit-in-place control and returns a value indicating the user requested action. The BrowseClass.AskRecord method carries out the user requested action.

Corresponding EQUATEs for the possible edit-in-place actions are declared in ABBROWSE.INC as follows:

```
EditAction     ITEMIZE(0),PRE
None            EQUATE                  ! no action
Forward         EQUATE                  ! next field
Backward        EQUATE                  ! previous field
Complete        EQUATE                  ! OK
Cancel          EQUATE                  ! cancel
Next            EQUATE                  ! next record
Previous        EQUATE                  ! previous record
                END
```

Return Data Type: BYTE

Example:

```
EditClassAction ROUTINE
  CASE SELF.EditList.Control.TakeEvent(EVENT())
  OF EditAction:Forward
  !handle tab forward (new field, same record)
  OF EditAction:Backward
  !handle tab backward (new field, same record)
  OF EditAction:Next
  !handle down arrow (new record, offer to save prior record)
  OF EditAction:Previous
  !handle up arrow (new record, offer to save prior record)
  OF EditAction:Complete
  !handle OK or enter key (save record)
  OF EditAction:Cancel
  !handle Cancel or esc key (restore record)
  END
```

See Also: BrowseClass.AskRecord

EditSpinClass

EditSpinClass--Overview

The EditSpinClass is an EditClass that supports a SPIN control. The EditSpinClass lets you implement a dynamic edit-in-place SPIN control for a column in a LIST.

EditSpinClass Concepts

The EditSpinClass creates a SPIN control, accepts input from the end user, then returns the input to the variable specified by the Init method, typically the variable associated with a specific LIST cell--a field in the LIST control's data source QUEUE. The EditSpinClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditSpinClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditSpinClass -- Relationship to Other Application Builder Classes

EditClass

The EditSpinClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseEIPManagerClass

The EditClass is managed by the BrowseEIPManagerClass. The BrowseEIPManagerClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditSpinClass--ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditSpinClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditSpinClass object's methods as needed. See *Control Templates--BrowseUpdateButton*s for more information. EditSpinClass Source Files

The EditSpinClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditSpinClass source code and their respective components are contained in:

ABEIP.INC	EditSpinClass declarations
ABEIP.CLW	EditSpinClass method definitions

EditSpinClass--Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditSpinClass object and a related BrowseClass object. The example page-loads a LIST of actions and associated attributes (priority and completed), then edits the "Priority" items with an EditSpinClass object. Note that the BrowseClass object calls the "registered" EditSpinClass object's methods as needed.

Note: The EditSpinClass requires values for PROP:RangeLow, PROP:RangeHigh, and PROP:Step to function correctly. The EditSpinClass.Init method is the proper place to set these properties. See *SPIN* in the *Language Reference* for more information.

```
   PROGRAM
_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)
   INCLUDE('ABWINDOW.INC'),ONCE
   INCLUDE('ABEIP.CLW'),ONCE
   INCLUDE('ABBROWSE.CLW'),ONCE
   MAP
   END
Actions        FILE,DRIVER('TOPSPEED'),PRE(ACT),CREATE,BINDABLE,THREAD
KeyAction        KEY(ACT:Action),NOCASE,OPT
Record           RECORD,PRE()
Action           STRING(20)
Priority         DECIMAL(2)
Completed        DECIMAL(1)
                 END
               END
ViewActions    VIEW(Actions)
               END
ActQ           QUEUE
ACT:Action       LIKE(ACT:Action)
ACT:Priority     LIKE(ACT:Priority)
ACT:Completed    LIKE(ACT:Completed)
ViewPosition     STRING(1024)
               END

ActionWindow  WINDOW('Actions File'),AT(,,164,144),IMM,SYSTEM,GRAY|
              LIST,AT(8,6,148,115),USE(?List),IMM,HVSCROLL,FORMAT('80L(2)|~Action~'&|
             '@S20@31C|~Priority~@N2@40L(2)|~Done~L(0)@N1@'),FROM(ActQ)
              BUTTON('&Insert'),AT(10,126,45,14),USE(?Insert:2)
              BUTTON('&Change'),AT(59,126,45,14),USE(?Change:2),DEFAULT
              BUTTON('&Delete'),AT(108,126,45,14),USE(?Delete:2)
              END
```

```
ThisWindow     CLASS(WindowManager)
Init             PROCEDURE(),BYTE,PROC,DERIVED
Kill             PROCEDURE(),BYTE,PROC,DERIVED
               END
BRW1           CLASS(BrowseClass)
Q                &ActQ
               END



Edit:ACT:Priority CLASS(EditSpinClass)   ! Edit-in-place class for field ACT:Priority
Init                PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),DERIVED
                   END
  CODE
  GlobalResponse = ThisWindow.Run()

ThisWindow.Init PROCEDURE
ReturnValue          BYTE,AUTO
  CODE
  SELF.Request = GlobalRequest
  ReturnValue =PARENT.Init()
  IF ReturnValue THEN RETURN ReturnValue.
  SELF.FirstField = ?List
  SELF.Errors &= GlobalErrors
  CLEAR(GlobalRequest)
  CLEAR(GlobalResponse)
  Relate:Actions.Open
  FilesOpened = True
  BRW1.Init(?List,ActQ.ViewActions,BRW1::ViewActions,ActQ,Relate:Actions,SELF)
  OPEN(ActionWindow)
  SELF.Opened=True
  BRW1.Q &= ActQ
  BRW1.AddSortOrder(ACT:KeyAction)
  BRW1.AddField(ACT:Action,BRW1.Q.ACT:Action)
  BRW1.AddField(ACT:Priority,BRW1.Q.ACT:Priority)
  BRW1.AddField(ACT:Completed,BRW1.Q.ACT:Completed)
  BRW1.AddEditControl(EditInPlace::ACT:Priority,2)   !Add cutom edit-inplace class
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert:2
  BRW1.ChangeControl=?Change:2
  BRW1.DeleteControl=?Delete:2
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill PROCEDURE
ReturnValue          BYTE,AUTO
  CODE
  ReturnValue =PARENT.Kill()
```

```
  IF ReturnValue THEN RETURN ReturnValue.
  IF FilesOpened
    Relate:Actions.Close
  END
  RETURN ReturnValue

Edit:ACT:Priority.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*?
UseVar)
  CODE
  PARENT.Init(FieldNumber,ListBox,UseVar)
  SELF.FEQ{PROP:RANGE,1} = 1          !Set the Low Range for the Spinbox
  SELF.FEQ{PROP:RANGE,2} = 10         !Set the High Range for the Spinbox
  SELF.FEQ{PROP:Step} = 1             !Set the incremental steps of the Spinbox
```

EditSpinClass Properties

EditSpinClass Properties

The EditSpinClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* and *EditClass Concepts* for more information.

EditSpinClass Methods

EditSpinClass Methods

The EditSpinClass inherits all the methods of the EditClass from which it is derived. See *EditClass Methods* and *EditClass Concepts*.

EditSpinClass--Functional Organization--Expected Use

As an aid to understanding the EditSpinClass it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditSpinClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[VI]	initialize the EditSpinClass object
Kill[VI]	shut down the EditSpinClass object

Mainstream Use:

TakeEvent[VI]	handle events for the SPIN control

Occasional Use:

CreateContol[V]	create the SPIN control
SetAlerts[VI]	alert keystrokes for the SPIN control

[V] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditSpinClass object
CreateContol	create the SPIN control
SetAlerts[I]	alert keystrokes for the SPIN control
TakeEvent[I]	handle events for the SPIN control
Kill[I]	shut down the EditSpinClass object

CreateControl (create the edit-in-place SPIN control)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place SPIN control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method sets the value of the FEQ property. Use the Init method or the CreateControl method to set any required properties of the SPIN control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

EditCheckClass

EditCheckClass Overview

The EditCheckClass is an EditClass that supports a CHECK control. The EditCheckClass lets you implement a dynamic edit-in-place CHECK control for a column in a LIST.

EditCheckClass Concepts

The EditCheckClass creates a CHECK control, accepts input from the end user, then returns the input to the variable specified by the Init method, typically the variable associated with a specific LIST cell—a field in the LIST control's data source QUEUE. The EditCheckClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditCheckClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditCheckClass Relationship to Other Application Builder Classes

EditClass

The EditCheckClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditCheckClass ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditCheckClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditCheckClass object's methods as needed. See *Control Templates—BrowseUpdateButton*s for more information.

EditCheckClass Source Files

The EditCheckClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditCheckClass source code and their respective components are contained in:

ABEIP.INC	EditCheckClass declarations
ABEIP.CLW	EditCheckClass method definitions

EditCheckClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditCheckClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, icon, etc.), then edits the "Hide" items with an EditCheckClass object. Note that the BrowseClass object calls the "registered" EditCheckClass object's methods as needed.

```
   PROGRAM
_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)
   INCLUDE('ABWINDOW.INC')          !declare WindowManager
   INCLUDE('ABBROWSE.INC')          !declare BrowseClass
   INCLUDE('ABEIP.INC')             !declare Edit-in-place classes

   MAP
   END
Property  FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey    KEY(PR:FieldName),NOCASE,OPT
Record     RECORD,PRE()
FieldName   STRING(30)
Color       STRING(20)
Hidden      STRING(1)
IconFile    STRING(30)
ControlType STRING(12)
           END
          END

PropView   VIEW(Property)
           END

PropQ     QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:ControlType LIKE(PR:ControlType)
PR:Hidden      LIKE(PR:Hidden)       !edit this LIST field with a CHECK control
PR:IconFile    LIKE(PR:IconFile)
ViewPosition   STRING(1024)
          END

PropWindow WINDOW('Browse Field Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
```

```
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
      END

Edit:PR:Hide CLASS(EditCheckClass)  !declare Edit:PR:Color-EIP CHECK control
Init         PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
             END


ThisWindow   CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
             END

BRW1        CLASS(BrowseClass)    !declare BRW1, the BrowseClass object
Q           &PropQ                ! that drives the EditClass objects--
            END                   ! i.e. calls Init, TakeEvent, Kill

GlobalErrors    ErrorClass
Access:Property CLASS(FileManager)
Init             PROCEDURE
                END

Relate:Property   CLASS(RelationManager)
Init              PROCEDURE
Kill              PROCEDURE,VIRTUAL
                  END

GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest     LONG(0),THREAD
 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill

ThisWindow.Init PROCEDURE()
ReturnValue     BYTE,AUTO

CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
```

```
 OPEN(PropWindow)
 SELF.Opened=True
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  BRW1.AddEditControl(Edit:PR:Hide,4)      !Use Edit:PR:Hide to edit BRW1 column 4
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:Hide.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SELF.Feq{PROP:Text}='Hide '          !set EIP check box text
 SELF.Feq{PROP:Value,1}='Y'           !set EIP check box true value
 SELF.Feq{PROP:Value,2}='N'           !set EIP check box false value

Access:Property.Init PROCEDURE       !initialize FileManager
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)

Relate:Property.Init PROCEDURE       !initialize RelationManager
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)

Relate:Property.Kill PROCEDURE       !shut down RelationManager
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditCheckClass Properties

The EditCheckClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* and *EditClass Concepts* for more information.

EditCheckClass Methods

The EditCheckClass inherits all the methods of the EditClass from which it is derived. See *EditClass Methods* and *EditClass Concepts*.

In addition to (or instead of) the inherited methods, the EditCheckClass contains the following methods:

EditCheckClass Functional Organization—Expected Use

As an aid to understanding the EditCheckClass it is useful to organize its methods into two large categories according to their expected use—the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditCheckClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[VI]	initialize the EditCheckClass object
Kill[VI]	shut down the EditCheckClass object

Mainstream Use:

TakeEvent[VI]	handle events for the CHECK control

Occasional Use:

CreateContol[V]	create the CHECK control
SetAlerts[VI]	alert keystrokes for the CHECK control

[V] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly—the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditCheckClass object
CreateContol	create the CHECK control
SetAlerts[I]	alert keystrokes for the CHECK control
TakeEvent[I]	handle events for the CHECK control
Kill	shut down the EditCheckClass object

CreateControl (create the edit-in-place CHECK control)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place CHECK control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method sets the value of the FEQ property. Use the Init method or the CreateControl method to set any required properties of the CHECK control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

EditColorClass

EditColorClassOverview

The EditColorClass is an EditClass that supports the Windows Color dialog by way of a dynamic edit-in-place COMBO control.

EditColorClass Concepts

The EditColorClass creates a COMBO control with an ellipsis button that invokes the Windows Color dialog. The EditColorClass accepts a color selection from the end user, then returns the selection to the variable specified by the Init method, typically the variable associated with a specific LIST cell--a field in the LIST control's data source QUEUE.

The EditColorClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditColorClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditColorClass Relationship to Other Application Builder Classes

EditClass

The EditColorClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditColorClass ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditColorClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditColorClass object's methods as needed. See *Control Templates--BrowseUpdateButton*s for more information.

EditColorClass Source Files

The EditColorClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditColorClass source code and their respective components are contained in:

ABEIP.INC	EditColorClass declarations
ABEIP.CLW	EditColorClass method definitions
ABEIP.TRN	EditColorClass translation strings

EditColorClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditColorClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, icon, etc.), then edits the "Color" items with an EditColorClass object. Note that the BrowseClass object calls the "registered" EditColorClass object's methods as needed.

```
   PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABWINDOW.INC')        !declare WindowManager
   INCLUDE('ABBROWSE.INC')        !declare BrowseClass
   INCLUDE('ABEIP.INC')           !declare Edit-in-place classes

   MAP
   END

Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey     KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
IconFile     STRING(30)
ControlType  STRING(12)
            END
           END

PropView   VIEW(Property)
           END

PropQ     QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)       !edit this LIST field with the color dialog
PR:ControlType LIKE(PR:ControlType)
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)
ViewPosition   STRING(1024)
         END
```

```
PropWindow WINDOW('Browse Field Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
      END

Edit:PR:Color CLASS(EditColorClass)  !declare Edit:PR:Color-EIP color dialog
Init          PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
              END

ThisWindow    CLASS(WindowManager)
Init          PROCEDURE(),BYTE,PROC,VIRTUAL
Kill          PROCEDURE(),BYTE,PROC,VIRTUAL
              END

BRW1          CLASS(BrowseClass)    !declare BRW1, the BrowseClass object
Q             &PropQ                ! that drives the EditClass objects--
              END                   ! i.e. calls Init, TakeEvent, Kill

GlobalErrors    ErrorClass
Access:Property CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Property CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END
GlobalRequest   BYTE(0),THREAD
GlobalResponse  BYTE(0),THREAD
VCRRequest      LONG(0),THREAD
 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill
```

```
ThisWindow.Init PROCEDURE()
ReturnValue     BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  BRW1.AddEditControl(Edit:PR:Color,2)      !Use Edit:PR:Color to edit BRW1 column 2
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:Color.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SELF.Title='Select field color'        !set EIP color dialog title

Access:Property.Init PROCEDURE          !initialize FileManager
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)
```

```
Relate:Property.Init PROCEDURE          !initialize RelationManager
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)

Relate:Property.Kill PROCEDURE          !shut down RelationManager
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditColorClass Properties

EditColorClass Properties

The EditColorClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* for more information.

In addition to the inherited properties, the EditColorClass contains the following properties:

Title (color dialog title text)

Title CSTRING(256)

The **Title** property contains a string that sets the title bar text in the Windows color dialog.

Implementation: The EditColorClass (TakeEvent method) uses the Title property as the *title* parameter to the COLORDIALOG procedure. See *COLORDIALOG* in the *Language Reference* for more information.

See Also: TakeEvent

EditColorClass Methods

EditColorClass Functional Organization--Expected Use

As an aid to understanding the EditColorClass it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditColorClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[VI]	initialize the EditColorClass object
Kill[VI]	shut down the EditColorClass object

Mainstream Use:

TakeEvent[V]	handle events for the edit control

Occasional Use:

CreateContol[V]	create the edit (COMBO) control
SetAlerts[VI]	alert keystrokes for the edit control

[V] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditColorClass object
CreateContol	create the edit (COMBO) control
SetAlerts[I]	alert keystrokes for the edit control
TakeEvent	handle events for the edit control
Kill[I]	shut down the EditColorClass object

CreateControl (create the edit-in-place control)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place COMBO control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method creates a COMBO control with an ellipsis button and sets the value of the FEQ property.

Use the Init method or the CreateControl method to set any required properties of the COMBO control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

TakeEvent (process edit-in-place events:EditColorClass)

TakeEvent(*event* **), VIRTUAL**

TakeEvent	Processes an event for the EditColorClass object.
event	An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the EditColorClass object and returns a value indicating the user requested action. Valid actions are none, complete or OK, cancel, next record, previous record, next field, and previous field.

Implementation: The BrowseClass.AskRecord method calls the TakeEvent method. The TakeEvent method processes an EVENT:AlertKey for the edit-in-place control. On EVENT:DroppingDown, TakeEvent invokes the Windows color dialog and stores the color selection in the edited field specified by the Init method. Finally, TakeEvent returns a value indicating the user requested action. The BrowseClass.AskRecord method carries out the user requested action.

Corresponding EQUATEs for the possible edit-in-place actions are declared in ABBROWSE.INC as follows:

```
EditAction     ITEMIZE(0),PRE
None           EQUATE              ! no action
Forward        EQUATE              ! next field
Backward       EQUATE              ! previous field
Complete       EQUATE              ! OK
Cancel         EQUATE              ! cancel
Next           EQUATE              ! next record
Previous       EQUATE              ! previous record
Ignore         EQUATE              ! no action
               END
```

Return Data Type: BYTE

Example:

```
EditClassAction ROUTINE
  CASE SELF.EditList.Control.TakeEvent(EVENT())
  OF EditAction:Forward   !handle tab forward (new field, same record)
  OF EditAction:Backward  !handle tab backward (new field, same record)
  OF EditAction:Next      !handle down arrow (new record, offer to save prior record)
  OF EditAction:Previous  !handle up arrow (new record, offer to save prior record)
  OF EditAction:Complete  !handle OK or enter key (save record)
  OF EditAction:Cancel    !handle Cancel or esc key (restore record)
  END
```

See Also: Init, BrowseClass.AskRecord

EditDropComboClass

EditDropComboClass Overview

The EditDropComboClass is an EditClass that supports a dynamic edit-in-place COMBO control for a column in a LIST.

EditDropComboClass Concepts

The EditDropComboClass creates a COMBO control, accepts input from the end user, then returns the input to the variable specified by the Init method, typically the variable associated with a specific LIST cell—a field in the LIST control's data source QUEUE. The EditDropComboClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, canceling the edit, or completing the edit (moving to a new record or row). The EditDropComboClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

Relationship to Other Application Builder Classes

EditClass

The EditDropComboClass is derived from the EditDropListClass which in turn is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseEIPManagerClass

The EditClass is managed by the BrowseEIPManagerClass. The BrowseEIPManagerClass depends on the EditClass operating according to its documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditDropComboClass ABC Template Implementation

You can use the BrowseUpdateButtons control template (Configure EditInPlace**)** to generate the code to instantiate an EditDropComboClass object called EditInPlace:*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditDropComboClass object's methods as needed. See Control Templates—BrowseUpdateButtons for more information.

EditDropComboClass Source Files

The EditDropComboClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditDropComboClass source code and their respective components are contained in:

ABEIP.INC	EditDropComboClass declarations
ABEIP.CLW	EditDropComboClass method definitions

EditDropComboClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditDropComboClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, icon, etc.), then edits the "ControlType" items with an EditDropComboClass object. Note that the BrowseClass object calls the "registered" EditDropComboClass object's methods as needed.

```
   PROGRAM
_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABWINDOW.INC')          !declare WindowManager
   INCLUDE('ABBROWSE.INC')          !declare BrowseClass
   INCLUDE('ABEIP.INC')             !declare Edit-in-place classes

   MAP
   END

Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey     KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
IconFile     STRING(30)
ControlType  STRING(12)
            END
           END

PropView   VIEW(Property)
           END

PropQ        QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:ControlType LIKE(PR:ControlType) !edit this field with a COMBO control
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)
ViewPosition   STRING(1024)
              END

PropWindow WINDOW('Browse Field Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
```

```
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
           END
!declare Edit:PR:ControlType-EIP COMBO
Edit:PR:ControlType CLASS(EditDropComboClass)
Init   PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
                    END


ThisWindow   CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
             END

BRW1 CLASS(BrowseClass) !declare BRW1, the BrowseClass object
Q      &PropQ           ! that drives the EditClass objects—
     END                ! i.e. calls Init, TakeEvent, Kill

GlobalErrors    ErrorClass
Access:Property CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Property  CLASS(RelationManager)
Init              PROCEDURE
Kill              PROCEDURE,VIRTUAL
                 END

GlobalRequest    BYTE(0),THREAD
GlobalResponse   BYTE(0),THREAD
VCRRequest       LONG(0),THREAD

 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill


ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
```

```
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  !Use Edit:PR:ControlType to edit BRW1 col 3
  BRW1.AddEditControl(Edit:PR:ControlType,3)
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:ControlType.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED
ListBox,*? UseVar)
 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SELF.Feq{PROP:From}='ENTRY|SPIN|TEXT|STRING'!set ControlType droplist
choices

Access:Property.Init PROCEDURE               !initialize FileManager
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)
Relate:Property.Init PROCEDURE               !initialize RelationManager
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)
Relate:Property.Kill PROCEDURE               !shut down RelationManager
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditDropComboClass Properties

The EditDropComboClass inherits all of the properties of the EditDropListClass and EditClass from which is derived. See EditClass Properties and EditClass Concepts for more information.

EditDropComboClass Methods

The EditDropComboClass inherits all the methods of the EditDropListClass and EditClass from which it is derived. See EditClass Methods and EditClass Concepts for more information.

EditDropComboClass Functional Organization

Non-Virtual Methods

Occasional Use:

CreateContolv	create the LIST control

v This method is also virtual.

Virtual Methods

Typically you will not call this method directly—the Non-Virtual methods call it. However, we anticipate you will often want to override this method, and because it is virtual, it is very easy to override. This method does provide reasonable default behavior in case you do not want to override it.

CreateContol	create the LIST control

CreateControl (create the edit-in-place COMBO control)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place COMBO control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method sets the value of the FEQ property. Use the Init method or the CreateControl method to set any required properties of the COMBO control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

EditDropListClass

EditDropListClass Overview

The EditDropListClass is an EditClass that supports a DROPLIST control. The EditDropListClass lets you implement a dynamic edit-in-place DROPLIST control for a column in a LIST.

EditDropListClass Concepts

The EditDropListClass creates a DROPLIST control, accepts input from the end user, then returns the input to the variable specified by the Init method, typically the variable associated with a specific LIST cell--a field in the LIST control's data source QUEUE. The EditDropListClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditDropListClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditDropListClass Relationship to Other Application Builder Classes

EditClass

The EditDropListClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditDropListClass ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditDropListClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditDropListClass object's methods as needed. See *Control Templates--BrowseUpdateButton*s for more information.

EditDropListClass Source Files

The EditDropListClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditDropListClass source code and their respective components are contained in:

ABEIP.INC	EditDropListClass declarations
ABEIP.CLW	EditDropListClass method definitions

EditDropListClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditDropListClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, icon, etc.), then edits the "ControlType" items with an EditDropListClass object. Note that the BrowseClass object calls the "registered" EditDropListClass object's methods as needed.

```
   PROGRAM
_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)
   INCLUDE('ABWINDOW.INC')          !declare WindowManager
   INCLUDE('ABBROWSE.INC')          !declare BrowseClass
   INCLUDE('ABEIP.INC')             !declare Edit-in-place classes

   MAP
   END
Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey     KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
IconFile     STRING(30)
ControlType  STRING(12)
            END
           END
PropView   VIEW(Property)
           END

PropQ         QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:ControlType LIKE(PR:ControlType)    !edit this field with a DROPLIST control
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)
ViewPosition   STRING(1024)
              END

PropWindow WINDOW('Browse Field Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
           END
```

```
!declare Edit:PR:ControlType-EIP DROPLIST
Edit:PR:ControlType CLASS(EditDropListClass)
Init    PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
                  END

ThisWindow   CLASS(WindowManager)
Init          PROCEDURE(),BYTE,PROC,VIRTUAL
Kill          PROCEDURE(),BYTE,PROC,VIRTUAL
             END

BRW1        CLASS(BrowseClass)  !declare BRW1, the BrowseClass object
Q           &PropQ              ! that drives the EditClass objects--
            END                 ! i.e. calls Init, TakeEvent, Kill

GlobalErrors    ErrorClass
Access:Property CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Property CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END
GlobalRequest   BYTE(0),THREAD
GlobalResponse  BYTE(0),THREAD
VCRRequest      LONG(0),THREAD

 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill


ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
```

```
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  !Use Edit:PR:ControlType to edit BRW1 col 3
  BRW1.AddEditControl(Edit:PR:ControlType,3)
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:ControlType.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SELF.Feq{PROP:From}='ENTRY|SPIN|TEXT|STRING'!set ControlType droplist choices

Access:Property.Init PROCEDURE         !initialize FileManager
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)

Relate:Property.Init PROCEDURE         !initialize RelationManager
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)

Relate:Property.Kill PROCEDURE         !shut down RelationManager
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditDropListClass Properties

EditDropListClass Properties

The EditDropListClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* and *EditClass Concepts* for more information.

EditDropListClass Methods

EditDropListClass Functional Organization--Expected Use

As an aid to understanding the EditDropListClass it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditDropListClass methods.

Non-Virtual Methods

The non-virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[vI]	initialize the EditDropListClass object
Kill[vI]	shut down the EditDropListClass object

Mainstream Use:

TakeEvent[vI]	handle events for the LIST control

Occasional Use:

CreateContol[v]	create the LIST control
SetAlerts[v]	alert keystrokes for the LIST control

[v] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditDropListClass object
CreateContol	create the LIST control
SetAlerts	alert keystrokes for the LIST control
TakeEvent[I]	handle events for the LIST control
Kill[I]	shut down the EditDropListClass object

CreateControl (create the edit-in-place DROPLIST control)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place DROPLIST control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method sets the value of the FEQ property. Use the Init method or the CreateControl method to set any required properties of the DROPLIST control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

SetAlerts (alert keystrokes for the edit control:EditDropListClass)

SetAlerts, VIRTUAL

The **SetAlerts** method alerts appropriate keystrokes for the edit-in-place DROPLIST control.

Implementation: The Init method calls the CreateControl method to create the input control and set the FEQ property. The Init method then calls the SetAlerts method to alert appropriate edit-in-place keystrokes for the edit control. Alerted keys are:

```
TabKey          !next field
ShiftTab        !previous field
EnterKey        !complete and save
EscKey          !complete and cancel
```

Tip: Arrowup and Arrowdown keys are not alerted for a DROPLIST control because these keys are used to navigate within the DROPLISt.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: Init

SetReadOnly (set edit control to read-only:EditDropClass)

SetReadOnly(*state*), VIRTUAL

SetReadOnly	The **SetReadOnly** method places the edit-in-place control in a read-only state.
state	An integer constant, variable, EQUATE, or expression that indicates whether to disable the droplist control's dropdown button. A value of one (1 or True) disables the button. A value of zero (0 or False) has no effect on the control.

Implementation: The SetReadOnly method uses PROP:ReadOnly to place the edit-in-place conrol in a read-only state. After the parent call in the Init method of the EditInPlace object is the recommended place to call SetReadonly.

Example:

```
EditInPlace::CUS:Number.SetReadOnly()
```

See Also: ReadOnly

TakeEvent (process edit-in-place events:EditDropList Class)

TakeEvent(*event* **), VIRTUAL**

TakeEvent	Processes an event for the EditDropListClass object.
event	An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the EditDropListClass object and returns a value indicating the user requested action. Valid actions are none, complete or OK, cancel, next record, previous record, next field, and previous field.

Implementation: The TakeEvent method is called by the WindowManager.TakeEvent method. The TakeEvent method processes an EVENT:AlertKey for the edit-in-place control. TakeEvent returns a value indicating the user requested action.

Corresponding EQUATEs for the possible edit-in-place actions are declared in ABEIP.INC as follows:

```
EditAction     ITEMIZE(0),PRE
None            EQUATE                  ! no action
Forward         EQUATE                  ! next field
Backward        EQUATE                  ! previous field
Complete        EQUATE                  ! OK
Cancel          EQUATE                  ! cancel
Next            EQUATE                  ! next record
Previous        EQUATE                  ! previous record
Ignore          EQUATE                  ! no action
                END
```

Return Data Type: BYTE

Example:

```
WindowManager.TakeEvent  PROCEDURE
 CODE
 ! Event handling code
    LOOP i=1 TO RECORDS(SELF.FileDrops)
      GET(SELF.FileDrops,i)
      ASSERT(~ERRORCODE())
      SELF.FileDrops.FileDrop.TakeEvent
    END
```

See Also: Init

EditEntryClass

EditEntryClass Overview

The EditEntryClass is an EditClass that supports an ENTRY control. The EditEntryClass lets you implement a dynamic edit-in-place ENTRY control for a column in a LIST.

EditEntryClass Concepts

The EditEntryClass creates an ENTRY control, accepts input from the end user, then returns the input to the variable specified by the Init method, typically the variable associated with a specific LIST cell--a field in the LIST control's data source QUEUE. The EditEntryClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditEntryClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditEntryClass Relationship to Other Application Builder Classes

EditClass

The EditEntryClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

Tip: The BrowseClass instantiates the EditEntryClass as the default edit-in-place object whenever edit-in-place is requested (when BrowseClass.AskProcedure is zero).

EditEntryClass ABC Template Implementation

When you check the **Use EditInPlace** box and you do not set column-specific configuration, the BrowseUpdateButtons control template relies on the default BrowseBox edit-in-place behavior--which is the default BrowseClass edit-in-place implementation--which instantiates an EditEntryClass object for each BrowseBox column.

You can also use the BrowseUpdateButtons control template (**Configure EditInPlace**) to explicitly instantiate an EditEntryClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditEntryClass object's methods as needed. By explicitly requesting an EditEntryClass object, you gain access to EditEntryClass method embed points. See *Control Templates--BrowseUpdateButton*s for more information.

EditEntryClass Source Files

The EditEntryClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditEntryClass source code and their respective components are contained in:

ABEIP.INC	EditEntryClass declarations
ABEIP.CLW	EditEntryClass method definitions

EditEntryClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditEntryClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, icon, etc.), then edits the items with an EditEntryClass object. Note that the BrowseClass object calls the EditEntryClass object's methods as needed.

```
   PROGRAM
_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABWINDOW.INC')    !declare WindowManager
   INCLUDE('ABBROWSE.INC')    !declare BrowseClass
   INCLUDE('ABEIP.INC')       !declare Edit-in-place classes

   MAP
   END

Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey     KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
```

```
IconFile     STRING(30)
ControlType  STRING(12)
            END
           END

PropView   VIEW(Property)
           END

PropQ         QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:ControlType LIKE(PR:ControlType)
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)
ViewPosition   STRING(1024)
              END

PropWindow WINDOW('Browse Field Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
      END

Edit:PR:Name CLASS(EditEntryClass)  !declare Edit:PR:Name-EIP ENTRY control
Init         PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
             END

ThisWindow   CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
             END

BRW1        CLASS(BrowseClass)    !declare BRW1, the BrowseClass object
Q           &PropQ                ! that drives the EditClass objects--
            END                   ! i.e. calls Init, TakeEvent, Kill

GlobalErrors    ErrorClass

Access:Property CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Property CLASS(RelationManager)
Init            PROCEDURE
```

```
Kill            PROCEDURE,VIRTUAL
                END

GlobalRequest    BYTE(0),THREAD
GlobalResponse   BYTE(0),THREAD
VCRRequest       LONG(0),THREAD

 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill


ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)    !edit with Edit:PR:Name
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)            !default EditEntryClass
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)!edit with default EditEntryClass
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)          !edit with default EditEntryClass
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)      !edit with default EditEntryClass
  BRW1.AddEditControl(Edit:PR:Name,1)                !Use Edit:PR:Name for BRW1 col 1
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue
```

```
Edit:PR:Name.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)

 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SELF.Feq{PROP:CAP}=True                !force EIP mixed case input

Access:Property.Init PROCEDURE          !initialize FileManager
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)

Relate:Property.Init PROCEDURE          !initialize RelationManager
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)

Relate:Property.Kill PROCEDURE          !shut down RelationManager
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditEntryClass Properties

EditEntryClass Properties

The EditEntryClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* and *EditClass Concepts* for more information.

EditEntryClass Methods

EditEntryClass Methods

The EditEntryClass inherits all the methods of the EditClass from which it is derived. See *EditClass Methods* and *EditClass Concepts*.

EditEntryClass Functional Organization--Expected Use

As an aid to understanding the EditEntryClass it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditEntryClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[VI]	initialize the EditEntryClass object
Kill[VI]	shut down the EditEntryClass object

Mainstream Use:

TakeEvent[VI]	handle events for the ENTRY control

Occasional Use:

CreateContol[V]	create the ENTRY control
SetAlerts[VI]	alert keystrokes for the ENTRY control

[V] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditEntryClass object
CreateContol	create the ENTRY control
SetAlerts[I]	alert keystrokes for the ENTRY control
TakeEvent[I]	handle events for the ENTRY control
Kill[I]	shut down the EditEntryClass object

CreateControl (create the edit-in-place ENTRY control)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place ENTRY control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method sets the value of the FEQ property. Use the Init method or the CreateControl method to set any required properties of the ENTRY control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

EditFileClass

EditFileClass Overview

The EditFileClass is an EditClass that supports the Windows File dialog by way of a dynamic edit-in-place COMBO control.

EditFileClass Concepts

The EditFileClass creates a COMBO control with an ellipsis button that invokes the Windows File dialog. The EditFileClass accepts a pathname selection from the end user, then returns the selection to the variable specified by the Init method, typically the variable associated with a specific LIST cell--a field in the LIST control's data source QUEUE.

The EditFileClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditFileClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditFileClass Relationship to Other Application Builder Classes

EditClass

The EditFileClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditFileClass ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditFileClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditFileClass object's methods as needed. See *Control Templates--BrowseUpdateButton*s for more information.

EditFileClass Source Files

The EditFileClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditFileClass source code and their respective components are contained in:

ABEIP.INC	EditFileClass declarations
ABEIP.CLW	EditFileClass method definitions

EditFileClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditFileClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, icon, etc.), then edits the "IconFile" items with an EditFileClass object. Note that the BrowseClass object calls the "registered" EditFileClass object's methods as needed.

```
   PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABWINDOW.INC')          !declare WindowManager
   INCLUDE('ABBROWSE.INC')          !declare BrowseClass
   INCLUDE('ABEIP.INC')           !declare Edit-in-place classes

   MAP
   END

Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey     KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
IconFile     STRING(30)
ControlType  STRING(12)
            END
           END

PropView   VIEW(Property)
           END

PropQ         QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:ControlType LIKE(PR:ControlType)
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)      !edit this LIST field with the file dialog
ViewPosition   STRING(1024)
              END
```

```
PropWindow WINDOW('Browse Field Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
      END

Edit:PR:IconFile CLASS(EditFileClass)   !declare Edit:PR:IconFile-EIP file dialog
Init             PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
                 END

ThisWindow  CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
            END

BRW1        CLASS(BrowseClass)    !declare BRW1, the BrowseClass object
Q           &PropQ         ! that drives the EditClass objects--
            END            ! i.e. calls Init, TakeEvent, Kill

GlobalErrors    ErrorClass
Access:Property CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Property  CLASS(RelationManager)
Init             PROCEDURE
Kill             PROCEDURE,VIRTUAL
                 END
GlobalRequest    BYTE(0),THREAD
GlobalResponse   BYTE(0),THREAD
VCRRequest       LONG(0),THREAD
 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill


ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
```

```
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  BRW1.AddEditControl(Edit:PR:IconFile,5)    !Use Edit:PR:IconFile to edit BRW1 col 5
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:IconFile.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*?
UseVar)
  CODE
  PARENT.Init(FieldNumber,ListBox,UseVar)
  SELF.Title='Select icon file'               !set EIP file dialog title
  SELF.FilePattern='Icon files *.ico|*.ico'   !set EIP file dialog file masks
  SELF.FileMask=FILE:KeepDir+FILE:LongName    !set EIP file dialog behavior flag
```

```
Access:Property.Init PROCEDURE                !initialize FileManager
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)

Relate:Property.Init PROCEDURE                !initialize RelationManager
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)

Relate:Property.Kill PROCEDURE                !shut down RelationManager
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditFileClass Properties

EditFileClass Properties

The EditFileClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* and *EditClass Concepts* for more information.

FileMask (file dialog behavior)

FileMask BYTE

The **FileMask** property is a bitmap that indicates the type of file action the Windows file dialog performs (select, multi-select, save directory, lock directory, suppress errors).

Implementation: The EditFileClass (TakeEvent method) uses the FileMask property as the *flag* parameter to the FILEDIALOG procedure. See *FILEDIALOG* in the *Language Reference* for more information.

See Also: TakeEvent

FilePattern (file dialog filter)

FilePattern CSTRING(1024)

The **FilePattern** property contains a text string that defines both the file masks and the file mask descriptions that appear in the file dialog's **List Files of Type** drop-down list. The first mask is the default selection in the file dialog.

The FilePattern property should contain one or more descriptions followed by their corresponding file masks in the form description|masks|description|masks. All elements in the string must be delimited by the vertical bar (|). For example, **`'all files *.*|*.*|Clarion source *.clw;*.inc|*.clw;*.inc'`** defines two selections for the File dialog's **List Files of Type** drop-down list. See the *extensions* parameter to the FILEDIALOG function in the *Language Reference* for more information.

Title (file dialog title text)

Title CSTRING(256)

The **Title** property contains a string that sets the title bar text in the Windows file dialog.

Implementation: The EditFileClass (TakeEvent method) uses the Title property as the *title* parameter to the FILEDIALOG procedure. See *FILEDIALOG* in the *Language Reference* for more information.

See Also: TakeEvent

EditFileClass Methods

EditFileClass Functional Organization--Expected Use

As an aid to understanding the EditFileClass it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditFileClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[VI]	initialize the EditFileClass object
Kill[VI]	shut down the EditFileClass object

Mainstream Use:

TakeEvent[VI]	handle events for the edit control

Occasional Use:

CreateContol[V]	create the edit (COMBO) control
SetAlerts[VI]	alert keystrokes for the edit control

[V] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditFileClass object
CreateContol	create the edit (COMBO) control
SetAlerts[I]	alert keystrokes for the edit control
TakeEvent[I]	handle events for the edit control
Kill[I]	shut down the EditFileClass object

CreateControl (create the edit-in-place control:EditFileClass)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place COMBO control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method creates a COMBO control with an ellipsis button and sets the value of the FEQ property.

Use the Init method or the CreateControl method to set any required properties of the COMBO control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

TakeEvent (process edit-in-place events:EditFileClass)

TakeEvent(*event* **), VIRTUAL**

TakeEvent	Processes an event for the EditFileClass object.
event	An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the EditFileClass object and returns a value indicating the user requested action. Valid actions are none, complete or OK, cancel, next record, previous record, next field, and previous field.

Implementation: The BrowseClass.AskRecord method calls the TakeEvent method. The TakeEvent method processes an EVENT:AlertKey for the edit-in-place control. On EVENT:DroppingDown, TakeEvent invokes the Windows file dialog and stores the pathname selection in the edited field specified by the Init method. Finally, TakeEvent returns a value indicating the user requested action. The BrowseClass.AskRecord method carries out the user requested action.

Corresponding EQUATEs for the possible edit-in-place actions are declared in ABBROWSE.INC as follows:

```
EditAction     ITEMIZE(0),PRE
None           EQUATE              ! no action
Forward        EQUATE              ! next field
Backward       EQUATE              ! previous field
Complete       EQUATE              ! OK
Cancel         EQUATE              ! cancel
Next           EQUATE              ! next record
Previous       EQUATE              ! previous record
Ignore         EQUATE              ! no action
               END
```

Return Data Type: BYTE

Example:

```
EditClassAction ROUTINE
  CASE SELF.EditList.Control.TakeEvent(EVENT())
  OF EditAction:Forward   !handle tab forward (new field, same record)
  OF EditAction:Backward  !handle tab backward (new field, same record)
  OF EditAction:Next      !handle down arrow (new record, offer to save prior record)
  OF EditAction:Previous  !handle up arrow (new record, offer to save prior record)
  OF EditAction:Complete  !handle OK or enter key (save record)
  OF EditAction:Cancel    !handle Cancel or esc key (restore record)
  END
```

See Also: Init, BrowseClass.AskRecord

EditFontClass

EditFontClass Overview

The EditFontClass is an EditClass that supports the Windows Font dialog by way of a dynamic edit-in-place COMBO control.

EditFontClass Concepts

The EditFontClass creates a COMBO control with an ellipsis button that invokes the Windows Font dialog. The EditFontClass accepts a font specification from the end user, then returns the specification to the variable specified by the Init method, typically the variable associated with a specific LIST cell--a field in the LIST control's data source QUEUE.

The EditFontClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditFontClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditFontClass Relationship to Other Application Builder Classes

EditClass

The EditFontClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditFontClass ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditFontClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditFontClass object's methods as needed. See *Control Templates--BrowseUpdateButton*s for more information.

EditFontClass Source Files

The EditFontClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditFontClass source code and their respective components are contained in:

ABEIP.INC	EditFontClass declarations
ABEIP.CLW	EditFontClass method definitions

EditFontClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditFontClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, font, icon, etc.), then edits the "Font" items with an EditFontClass object. Note that the BrowseClass object calls the "registered" EditFontClass object's methods as needed.

```
   PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABWINDOW.INC')              !declare WindowManager
   INCLUDE('ABBROWSE.INC')              !declare BrowseClass
   INCLUDE('ABEIP.INC')                 !declare EditInPlace classes

   MAP   END

Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey     KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
IconFile     STRING(30)
Font         STRING(40)
ControlType  STRING(12)
ApplyTo      CSTRING(500)
            END
           END

PropView VIEW(Property)
         END

PropQ        QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:Font        LIKE(PR:Font)
PR:ControlType LIKE(PR:ControlType)
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)
PR:ApplyTo     LIKE(PR:ApplyTo)
ViewPosition   STRING(1024)
             END

BRW1    CLASS(BrowseClass)     !declare BRW1--a BrowseClass object
```

```
Q       &PropQ                ! that drives the EditClass objects
        END

Edit:PR:Font CLASS(EditFontClass)   !declare Edit:PR:Font-EIP font dialog
Init         PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
TakeEvent    PROCEDURE(UNSIGNED Event),BYTE,VIRTUAL
TypeFace     CSTRING(30)            !declare font typeface property
FontSize     LONG                   !declare font size property
FontStyle    LONG                   !declare font style property
FontColor    LONG                   !declare font color property
             END

PropWindow WINDOW('Browse Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Font~@s40@60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@' &|
           '120L(2)|_M~Apply To~L(0)@s25@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
      END

GlobalErrors   ErrorClass
Access:Property CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Property CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END

GlobalRequest   BYTE(0),THREAD
GlobalResponse  BYTE(0),THREAD
VCRRequest      LONG(0),THREAD

ThisWindow CLASS(WindowManager)
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END

 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill
```

```
ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
 ?PropList{PROP:LineHeight}=12          !enlarge rows to accomodate EIP icons
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:Font,BRW1.Q.PR:Font)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  BRW1.AddField(PR:ApplyTo,BRW1.Q.PR:ApplyTo)
  BRW1.AddEditControl(Edit:PR:Font,3)   !Use Edit:PR:Font to edit BRW1 col 3
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:Font.Init  PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
Comma        BYTE(1)
SaveFont     CSTRING(100)         !indexable hold area for font spec
i            USHORT
 CODE
 PARENT.Init(FieldNumber,ListBox,UseVar)
 SaveFont=SELF.UseVar             !comma separated font attributes
 IF SaveFont                      ! e.g. Arial,14,255,400
    LOOP WHILE Comma              !parse/separate the font attributes
```

```
      Comma = INSTRING(',',SaveFont,1,1)
      i+=1
      IF Comma
        EXECUTE i
          SELF.TypeFace  = SaveFont[1 : Comma-1]   !get Typeface
          SELF.FontSize  = SaveFont[1 : Comma-1]   !get FontSize
          BEGIN
            SELF.FontColor = SaveFont[1 : Comma-1] !get FontColor & Style
            SELF.FontStyle = SaveFont[Comma+1 : LEN(SaveFont)]
          END
        END
        SaveFont=SaveFont[Comma+1 : LEN(SaveFont)]
      END
    END
  END

Edit:PR:Font.TakeEvent PROCEDURE(UNSIGNED Event)
ReturnValue       BYTE,AUTO
  CODE
  CASE Event
  OF EVENT:DroppingDown  !call Font dialog & store result
                         ! in comma separated string
  IF FONTDIALOG(SELF.Title,SELF.TypeFace,SELF.FontSize,SELF.FontColor,SELF.FontStyle)
   SELF.UseVar = SELF.TypeFace&','&SELF.FontSize&','&SELF.FontColor&','&SELF.FontStyle
   DISPLAY(SELF.Feq)
  END
  RETURN EditAction:Ignore         !no I/O action on DroppingDown
  ELSE                             !otherwise, default I/O action:
    RETURN PARENT.TakeEvent(Event) ! save, cancel, next field, etc.
  END

Access:Property.Init PROCEDURE
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)

Relate:Property.Init PROCEDURE
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)

Relate:Property.Kill PROCEDURE
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditFontClass Properties

EditFontClass Properties

The EditFontClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* and *EditClass Concepts* for more information.

In addition to the inherited properties, the EditFontClass contains the following properties:

Title (font dialog title text)

Title CSTRING(256)

The **Title** property contains a string that sets the title bar text in the Windows font dialog.

Implementation: The EditFontClass (TakeEvent method) uses the Title property as the *title* parameter to the FONTDIALOG procedure. See *FONTDIALOG* in the *Language Reference* for more information.

See Also: TakeEvent

EditFontClass Methods

EditFontClass Methods

The EditFontClass inherits all the methods of the EditClass from which it is derived. See *EditClass Methods* and *EditClass Concepts*.

EditFontClass Functional Organization--Expected Use

As an aid to understanding the EditFontClass it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditFontClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[VI]	initialize the EditFontClass object
Kill[VI]	shut down the EditFontClass object

Mainstream Use:

TakeEvent[V]	handle events for the edit control

Occasional Use:

CreateContol[V]	create the edit (COMBO) control
SetAlerts[VI]	alert keystrokes for the edit control

[V] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditFontClass object
CreateContol	create the edit (COMBO) control
SetAlerts[I]	alert keystrokes for the edit control
TakeEvent	handle events for the edit control
Kill[I]	shut down the EditFontClass object

CreateControl (create the edit-in-place control:EditFontClass)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place COMBO control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method creates a COMBO control with an ellipsis button and sets the value of the FEQ property.

Use the Init method or the CreateControl method to set any required properties of the COMBO control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

TakeEvent (process edit-in-place events:EditFontClass)

TakeEvent(*event* **), VIRTUAL**

TakeEvent Processes an event for the EditFontClass object.

event An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the EditFontClass object and returns a value indicating the user requested action. Valid actions are none, complete or OK, cancel, next record, previous record, next field, and previous field.

Implementation: The BrowseClass.AskRecord method calls the TakeEvent method. The TakeEvent method processes an EVENT:AlertKey for the edit-in-place control. On EVENT:DroppingDown, TakeEvent invokes the Windows font dialog and stores the font specification in the edited field specified by the Init method. Finally, TakeEvent returns a value indicating the user requested action. The BrowseClass.AskRecord method carries out the user requested action.

Corresponding EQUATEs for the possible edit-in-place actions are declared in ABEIP.INC as follows:

```
EditAction     ITEMIZE(0),PRE
None           EQUATE              ! no action
Forward        EQUATE              ! next field
Backward       EQUATE              ! previous field
Complete       EQUATE              ! OK
Cancel         EQUATE              ! cancel
Next           EQUATE              ! next record
Previous       EQUATE              ! previous record
Ignore         EQUATE              ! no action
               END
```

Return Data Type: BYTE

Example:

```
EditClassAction ROUTINE
  CASE SELF.EditList.Control.TakeEvent(EVENT())
  OF EditAction:Forward   !handle tab forward (new field, same record)
  OF EditAction:Backward  !handle tab backward (new field, same record)
  OF EditAction:Next      !handle down arrow (new record, offer to save prior record)
  OF EditAction:Previous  !handle up arrow (new record, offer to save prior record)
  OF EditAction:Complete  !handle OK or enter key (save record)
  OF EditAction:Cancel    !handle Cancel or esc key (restore record)
  END
```

See Also: Init, BrowseClass.AskRecord

EditMultiSelectClass

EditMultiSelectClass Overview

The EditMultiSelectClass is an EditClass that supports a MultiSelect dialog by way of a dynamic edit-in-place COMBO control.

EditMultiSelectClass Concepts

The EditMultiSelectClass creates a COMBO control with an ellipsis button that invokes the MultiSelect dialog. The MultiSelect dialog is an interface for selecting and ordering items from a list.

The EditMultiSelectClass provides an AddValue method so you can prime the dialog's Available Items and Selected Items lists.

The EditMultiSelectClass accepts input (selection actions) from the end user, then signals the calling procedure when selection actions occur. The EditMultiSelectClass provides a virtual TakeAction method to let you take control of the end user input.

The EditMultiSelectClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, canceling the edit, or completing the edit (moving to a new record or row). The EditMultiSelectClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditMultiSelectClass Relationship to Other Application Builder Classes

EditClass

The EditMultiSelectClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseClass

The EditClass is loosely integrated into the BrowseClass. The BrowseClass depends on the EditClass operating according to it's documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

EditMultiSelectClass ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditMultiSelectClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditMultiSelectClass object's methods as needed. See *Control Templates--BrowseUpdateButton*s for more information.

EditMultiSelectClass Source Files

The EditMultiSelectClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditMultiSelectClass source code and their respective components are contained in:

ABEIP.INC	EditMultiSelectClass declarations
ABEIP.CLW	EditMultiSelectClass method definitions

EditMultiSelectClass Conceptual Example

The following example shows a sequence of statements to declare, instantiate, initialize, use, and terminate an EditMultiSelectClass object and a related BrowseClass object. The example page-loads a LIST of fieldnames and associated control attributes (such as color, font, when-to-apply, etc.), then edits the "when-to-apply" items with an EditMultiSelectClass object. Note that the BrowseClass object calls the "registered" EditMultiSelectClass object's methods as needed.

```
   PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABWINDOW.INC')
   INCLUDE('ABBROWSE.INC')
   INCLUDE('ABEIP.INC')

   MAP
   END

Property   FILE,DRIVER('TOPSPEED'),PRE(PR),CREATE,BINDABLE,THREAD
NameKey     KEY(PR:FieldName),NOCASE,OPT
Record      RECORD,PRE()
FieldName    STRING(30)
Color        STRING(20)
Hidden       STRING(1)
IconFile     STRING(30)
Font         STRING(40)
ControlType  STRING(12)
ApplyTo      CSTRING(500)
            END
           END

PropView   VIEW(Property)
           END

PropQ        QUEUE
PR:FieldName   LIKE(PR:FieldName)
PR:Color       LIKE(PR:Color)
PR:Font        LIKE(PR:Font)
PR:ControlType LIKE(PR:ControlType)
PR:Hidden      LIKE(PR:Hidden)
PR:IconFile    LIKE(PR:IconFile)
PR:ApplyTo     LIKE(PR:ApplyTo)
ViewPosition   STRING(1024)
             END
```

```
BRW1    CLASS(BrowseClass)
Q       &PropQ
        END
!declare Edit:PR:ApplyTo-EIP multi dialog
Edit:PR:ApplyTo  CLASS(EditMultiSelectClass)
Init             PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar),VIRTUAL
TakeAction       PROCEDURE(BYTE Action,<STRING Item>,LONG Pos1=0,LONG Pos2=0),VIRTUAL
                 END

PropWindow WINDOW('Browse Properties'),AT(,,318,137),IMM,SYSTEM,GRAY
       LIST,AT(8,4,303,113),USE(?PropList),IMM,HVSCROLL,FROM(PropQ),|
       FORMAT( '50L(2)|_M~Field Name~@s30@[70L(2)|_M~Color~@s20@' &|
           '60L(2)|_M~Font~@s40@60L(2)|_M~Control Type~@s12@' &|
           '20L(2)|_M~Hide~L(0)@s1@/130L(2)|_M~Icon File~@s30@' &|
           '120L(2)|_M~Apply To~L(0)@s25@]|M')
       BUTTON('&Insert'),AT(169,121),USE(?Insert)
       BUTTON('&Change'),AT(218,121),USE(?Change),DEFAULT
       BUTTON('&Delete'),AT(267,121),USE(?Delete)
      END

GlobalErrors   ErrorClass
Access:Property CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Property  CLASS(RelationManager)
Init             PROCEDURE
Kill             PROCEDURE,VIRTUAL
                 END

GlobalRequest   BYTE(0),THREAD
GlobalResponse  BYTE(0),THREAD
VCRRequest      LONG(0),THREAD

ThisWindow CLASS(WindowManager)
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END

 CODE
 GlobalErrors.Init
 Relate:Property.Init
 GlobalResponse = ThisWindow.Run()
 Relate:Property.Kill
 GlobalErrors.Kill
```

```
ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?PropList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:Property.Open
 BRW1.Init(?PropList,PropQ.ViewPosition,PropView,PropQ,Relate:Property,SELF)
 OPEN(PropWindow)
 SELF.Opened=True
 ?PropList{PROP:LineHeight}=12          !enlarge rows to accomodate EIP icons
  BRW1.Q &= PropQ
  BRW1.AddSortOrder(,PR:NameKey)
  BRW1.AddField(PR:FieldName,BRW1.Q.PR:FieldName)
  BRW1.AddField(PR:Color,BRW1.Q.PR:Color)
  BRW1.AddField(PR:Font,BRW1.Q.PR:Font)
  BRW1.AddField(PR:ControlType,BRW1.Q.PR:ControlType)
  BRW1.AddField(PR:Hidden,BRW1.Q.PR:Hidden)
  BRW1.AddField(PR:IconFile,BRW1.Q.PR:IconFile)
  BRW1.AddField(PR:ApplyTo,BRW1.Q.PR:ApplyTo)
  BRW1.AddEditControl(Edit:PR:ApplyTo,7)     !use Edit:PR:ApplyTo to edit BRW1 col 7
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Property.Close
  RETURN ReturnValue

Edit:PR:ApplyTo.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
  CODE
  PARENT.Init(FieldNumber,ListBox,UseVar)
  SELF.Reset
  SELF.AddValue('Browse',INSTRING('Browse',SELF.UseVar,1,1))!set multi-select choice
  SELF.AddValue('Form',INSTRING('Form',SELF.UseVar,1,1))    !set multi-select choice
  SELF.AddValue('Report',INSTRING('Report',SELF.UseVar,1,1))!set multi-select choice
  SELF.AddValue('Window',INSTRING('Window',SELF.UseVar,1,1))!set multi-select choice
```

```
Edit:PR:ApplyTo.TakeAction PROCEDURE(BYTE Action,<STRING Item>,LONG Pos1=0,LONG Pos2=0)
HoldIt  CSTRING(1024)         !indexable string of end user choices
Pos     USHORT                !index to parse end user selections
Comma   USHORT                !index to parse end user selections
ItemQ   QUEUE                 !Q to reorder end user selections
Item     CSTRING(100)
Ord      BYTE
        END
 CODE
 PARENT.TakeAction(Action,Item,Pos1,Pos2)
 HoldIt=SELF.UseVar
 CASE Action
 OF MSAction:Add              !end user selected an Item
    IF HoldIt
      HoldIt=HoldIt&','&Item
    ELSE
      HoldIt=Item
    END
 OF MSAction:Delete           !end user deselected an Item
    Pos=INSTRING(Item,HoldIt,1,1)
    CASE Pos
    OF 0
      MESSAGE(Item&' not found!')
    OF 1                      !first item
      HoldIt=HoldIt[Pos+LEN(Item)+1 : LEN(HoldIt)] !deselect first item
    ELSE
      IF Pos+LEN(Item) > LEN(HoldIt)              !last item
        HoldIt=HoldIt[1 : Pos-2]                  !deselect last item
      ELSE                                        !deselect any other item
        HoldIt=HoldIt[1 : Pos-1] & HoldIt[Pos+LEN(Item)+1 : LEN(HoldIt)]
      END
    END
  OF MSAction:Move                !Selected Item moved up or down
    FREE(ItemQ)                   ! Pos1=Item's "old" position
    CLEAR(ItemQ)                  ! Pos2=Item's "new" position
    Comma=1
    LOOP WHILE Comma              !build Q of Selected Items
      Comma = INSTRING(',',HoldIt,1,1)      ! to use for repositioning
      ItemQ.Ord+=1
      IF Comma
        ItemQ.Item  = HoldIt[1 : Comma-1]
        ADD(ItemQ,ItemQ.Ord)
    HoldIt=HoldIt[Comma+1 : LEN(HoldIt)]    !comma separated list of user choices
      ELSE
        ItemQ.Item = HoldIt
        ADD(ItemQ,ItemQ.Ord)
      END
    END
```

```
    ItemQ.Ord=Pos2
    GET(ItemQ, ItemQ.Ord)                   !get the "bumped" item
    ItemQ.Ord=Pos1
    PUT(ItemQ)                              !reposition the "bumped" item
    ItemQ.Item=Item
    GET(ItemQ, ItemQ.Item)                  !get the selected item
    ItemQ.Ord=Pos2
    PUT(ItemQ)                              !reposition the selected item
    SORT(ItemQ,ItemQ.Ord)                   !reorder Q of selected items
    HoldIt=''
    LOOP Pos = 1 TO RECORDS(ItemQ)          !refill comma separated list
      GET(ItemQ,Pos)
      IF HoldIt
        HoldIt=HoldIt&','&ItemQ.Item
      ELSE
        HoldIt=ItemQ.Item
      END
    END
 OF MSAction:StartProcess                   !begin AddAll (>>) or DeleteAll (<<)
  SETCURSOR(CURSOR:Wait)
 OF MSAction:EndProcess                     !end AddAll (>>) or DeleteAll (<<)
  SETCURSOR()
 END
 SELF.UseVar=HoldIt
Access:Property.Init PROCEDURE
 CODE
 PARENT.Init(Property,GlobalErrors)
 SELF.FileNameValue = 'Property'
 SELF.Buffer &= PR:Record
 SELF.Create = 1
 SELF.AddKey(PR:NameKey,'PR:NameKey',0)

Relate:Property.Init PROCEDURE
 CODE
 Access:Property.Init
 PARENT.Init(Access:Property,1)
Relate:Property.Kill PROCEDURE
 CODE
 Access:Property.Kill
 PARENT.Kill
```

EditMultiSelectClass Properties

EditMultiSelectClass Properties

The EditMultiSelectClass inherits all the properties of the EditClass from which it is derived. See *EditClass Properties* and *EditClass Concepts* for more information.

In addition to the inherited properties, the EditMultiSelectClass contains the following properties:

Title (font dialog title text:EditMultiSelectClass)

Title CSTRING(256)

The **Title** property contains a string that sets the title bar text in the MultiSelect dialog.

EditMultiSelectClass Methods

EditMultiSelectClass Methods

The EditMultiSelectClass inherits all the methods of the EditClass from which it is derived. See *EditClass Methods* and *EditClass Concepts*.

EditMultiSelectClass Functional Organization--Expected Use

As an aid to understanding the EditMultiSelectClass it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditMultiSelectClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[v]	initialize the EditMultiSelectClass object
AddValue	prime the MultiSelect dialog
Kill[v]	shut down the EditMultiSelectClass object

Mainstream Use:

TakeAction[v]	handle user actions for the dialog
TakeEvent[v]	handle events for the edit control

Occasional Use:

CreateContol[v]	create the edit (COMBO) control
Reset	clear the MultiSelect dialog
SetAlerts[vI]	alert keystrokes for the edit control

[v] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init	initialize the EditMultiSelectClass object
CreateContol	create the edit (COMBO) control
SetAlertsI	alert keystrokes for the edit control
TakeAction	handle user actions for the dialog
TakeEvent	handle events for the edit control
Kill	shut down the EditMultiSelectClass object

AddValue (prime the MultiSelect dialog)

AddValue(*item* [,*selected*] **)**

AddValue	Primes the Available and Selected items lists in the MultiSelect dialog.
item	A string constant, variable, EQUATE, or expression that contains the value to add to the item list.
selected	An integer constant, variable, EQUATE, or expression that indicates which list to update. A value of zero (0 or False) adds the *item* to the Available Items list; a value of one (1 or True) adds the *item* to the Selected Items list. If omitted, *selected* defaults to zero and AddValue adds the *item* to the Available Items list.

The **AddValue** method primes the Available and Selected items lists in the MultiSelect dialog.

Example:

```
Edit:PR:ApplyTo.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
  CODE
  PARENT.Init(FieldNumber,ListBox,UseVar)
  SELF.Reset
  SELF.AddValue('Browse',INSTRING('Browse',SELF.UseVar,1,1))  !set multi-select choice
  SELF.AddValue('Form',INSTRING('Form',SELF.UseVar,1,1))      !set multi-select choice
  SELF.AddValue('Report',INSTRING('Report',SELF.UseVar,1,1))  !set multi-select choice
  SELF.AddValue('Window',INSTRING('Window',SELF.UseVar,1,1))  !set multi-select choice
```

CreateControl (create the edit-in-place control:EditMultiSelectClass)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place COMBO control and sets the FEQ property.

Implementation: The Init method calls the CreateControl method. The CreateControl method creates a read only COMBO control with an ellipsis button and sets the value of the FEQ property.

Use the Init method or the CreateControl method to set any required properties of the COMBO control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

Reset (reset the EditMultiSelectClass object)

Reset

The **Reset** method resets the EditMultiSelectClass object.

Implementation: The Reset method clears the Available and Selected items lists in the MultiSelect dialog. Use the AddValue method to refill these lists.

Example:

```
Edit:PR:ApplyTo.Init PROCEDURE(UNSIGNED FieldNumber,UNSIGNED ListBox,*? UseVar)
  CODE
  PARENT.Init(FieldNumber,ListBox,UseVar)
  SELF.Reset
  SELF.AddValue('Browse',INSTRING('Browse',SELF.UseVar,1,1))  !set multi-select choice
  SELF.AddValue('Form',INSTRING('Form',SELF.UseVar,1,1))      !set multi-select choice
  SELF.AddValue('Report',INSTRING('Report',SELF.UseVar,1,1))  !set multi-select choice
  SELF.AddValue('Window',INSTRING('Window',SELF.UseVar,1,1))  !set multi-select choice
```

See Also: AddValue

TakeAction (process MultiSelect dialog action)

TakeAction(*action* [, *item*] [,*oldposition*] [,*newposition*] **), VIRTUAL**

TakeAction	Processes a MultiSelect dialog action.
action	An integer constant, variable, EQUATE, or expression that contains the action to process. Valid actions are add (select), delete (deselect), move, begin process, and end process.
item	A string constant, variable, EQUATE, or expression that contains the value of the list item affected by the *action*. If omitted, the *action* affects no *item*. For example a begin process action is not associated with a list item.
oldposition	An integer constant, variable, EQUATE, or expression that contains the ordinal position of the *item* (in the Selected Items list) prior to the move *action*. If omitted, *oldposition* defaults to zero (0), indicating a non-move *action*.
newposition	An integer constant, variable, EQUATE, or expression that contains the ordinal position of the *item* (in the Selected Items list) after the move *action*. If omitted, *newposition* defaults to zero (0), indicating a non-move *action*.

The **TakeAction** method processes a MultiSelect dialog action for the EditMultiSelectClass object. The TakeAction method is your opportunity to interpret and implement the meaning of the end user's selection.

Tip: The TakeAction processing is immediate and occurs while the MultiSelect dialog is open. The MultiSelect dialog does not generate an action or an event when the dialog closes.

Implementation: The TakeEvent method (indirectly) calls the TakeAction method each time the end user makes a new selection or moves a selection in the MultiSelect dialog.

Corresponding EQUATEs for the MultiSelect dialog *action* are declared in ABEIP.INC as follows:

```
MSAction       ITEMIZE(1),PRE
Add            EQUATE       !add / select
Delete         EQUATE       !delete / deselect
Move           EQUATE       !reposition a selected item
StartProcess   EQUATE       !begin an add/delete series
EndProcess     EQUATE       !end an add/delete series
               END
```

Example:

```
!This implementation of TakeAction converts the end user selections into
!comma separated items in a string.
Edit:PR:ApplyTo.TakeAction PROCEDURE(BYTE Action,<STRING Item>,LONG Pos1=0,LONG Pos2=0)
HoldIt  CSTRING(1024)        !indexable string of end user choices
Pos    USHORT                !index to parse end user selections
Comma   USHORT               !index to parse end user selections
ItemQ   QUEUE                !Q to reorder end user selections
Item    CSTRING(100)
Ord     BYTE
     END
 CODE
 PARENT.TakeAction(Action,Item,Pos1,Pos2)
 HoldIt=SELF.UseVar
 CASE Action
 OF MSAction:Add             !end user selected an Item
  HoldIt=CHOOSE(HoldIt,HoldIt&','&Item,Item)
 OF MSAction:Delete          !end user deselected an Item
    Pos=INSTRING(Item,HoldIt,1,1)
    IF Pos=1                 !first item
      HoldIt=HoldIt[Pos+LEN(Item)+1 : LEN(HoldIt)] !deselect first item
    ELSE
      IF Pos+LEN(Item) > LEN(HoldIt)      !last item
        HoldIt=HoldIt[1 : Pos-2]          !deselect last item
      ELSE                                !deselect any other item
        HoldIt=HoldIt[1 : Pos-1] & HoldIt[Pos+LEN(Item)+1 : LEN(HoldIt)]
      END
    END
  OF MSAction:Move                        !Selected Item moved up or down
    FREE(ItemQ)                           ! Pos1=Item's "old" position
    CLEAR(ItemQ)                          ! Pos2=Item's "new" position
    Comma=1
    LOOP WHILE Comma                      !build Q of Selected Items
      Comma = INSTRING(',',HoldIt,1,1)    ! to use for repositioning
      ItemQ.Ord+=1
      IF Comma
        ItemQ.Item  = HoldIt[1 : Comma-1]
```

```
      ADD(ItemQ,ItemQ.Ord)
    HoldIt=HoldIt[Comma+1 : LEN(HoldIt)]  !comma separated list of user choices
      ELSE
        ItemQ.Item = HoldIt
        ADD(ItemQ,ItemQ.Ord)
      END
    END
    ItemQ.Ord=Pos2
    GET(ItemQ, ItemQ.Ord)                 !get the "bumped" item
    ItemQ.Ord=Pos1
    PUT(ItemQ)                            !reposition the "bumped" item
    ItemQ.Item=Item
    GET(ItemQ, ItemQ.Item)                !get the selected item
    ItemQ.Ord=Pos2
    PUT(ItemQ)                            !reposition the selected item
    SORT(ItemQ,ItemQ.Ord)                 !reorder Q of selected items
    HoldIt=''



    LOOP Pos = 1 TO RECORDS(ItemQ)        !refill comma separated list
     GET(ItemQ,Pos)
     HoldIt=CHOOSE(Holdit,HoldIt&','&ItemQ.Item,ItemQ.Item)
    END
 OF MSAction:StartProcess                 !begin AddAll (>>) or DeleteAll (<<)
  SETCURSOR(CURSOR:Wait)
 OF MSAction:EndProcess                   !end AddAll (>>) or DeleteAll (<<)
  SETCURSOR()
 END
 SELF.UseVar=HoldIt
```

See Also: TakeEvent

TakeEvent (process edit-in-place events:EditMultiSelectClass)

TakeEvent(*event* **), VIRTUAL**

TakeEvent Processes an event for the EditMultiSelectClass object.

event An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the EditMultiSelectClass object and returns a value indicating the user requested action. Valid actions are none, complete or OK, cancel, next record, previous record, next field, and previous field.

Implementation: The BrowseClass.AskRecord method calls the TakeEvent method. The TakeEvent method processes an EVENT:AlertKey for the edit-in-place control. On EVENT:DroppingDown, TakeEvent invokes the MultiSelect dialog. Finally, TakeEvent returns a value indicating the user requested action. The BrowseClass.AskRecord method carries out the user requested action.

Corresponding EQUATEs for the possible edit-in-place actions are declared in ABEIP.INC as follows:

```
EditAction     ITEMIZE(0),PRE
None           EQUATE              ! no action
Forward        EQUATE              ! next field
Backward       EQUATE              ! previous field
Complete       EQUATE              ! OK
Cancel         EQUATE              ! cancel
Next           EQUATE              ! next record
Previous       EQUATE              ! previous record
Ignore         EQUATE              ! no action
               END
```

Return Data Type: BYTE

Example:

```
EditClassAction ROUTINE
  CASE SELF.EditList.Control.TakeEvent(EVENT())
  OF EditAction:Forward   !handle tab forward (new field, same record)
  OF EditAction:Backward  !handle tab backward (new field, same record)
  OF EditAction:Next      !handle down arrow (new record, offer to save prior record)
  OF EditAction:Previous  !handle up arrow (new record, offer to save prior record)
  OF EditAction:Complete  !handle OK or enter key (save record)
  OF EditAction:Cancel    !handle Cancel or esc key (restore record)
  END
```

See Also: Init, BrowseClass.AskRecord

EditTextClass

EditTextClass: Overview

The EditTextClass is an EditClass that supports memo and large string fields by way of an edit-in-place COMBO control.

EditTextClass Concepts

The EditTextClass creates a COMBO control with an ellipsis button that invokes a text dialog.

The EditTextClass also signals the calling procedure whenever significant edit-in-place events occur, such as tabbing to a new column, cancelling the edit, or completing the edit (moving to a new record or row). The EditTextClass provides a virtual TakeEvent method to let you take control of significant edit-in-place events.

EditTextClass:Relationship to Other Application Builder Classes

EditClass

The EditTextClass is derived from the EditClass. The EditClass serves as the foundation and framework for its derived classes. These derived classes each provide a different type of input control or input user interface. You can control the values returned by these derived EditClass objects by using their virtual methods. See the *Conceptual Example*.

BrowseEIPManagerClass

The EditClass is managed by the BrowseEIPManagerClass. The BrowseEIPManagerClass depends on the EditClass operating according to its documented specifications; however, the EditClass may be called by non-BrowseClass procedures and objects.

ABC Template Implementation

You can use the BrowseUpdateButtons control template (**Configure EditInPlace**) to generate the code to instantiate an EditTextClass object called EditInPlace::*fieldname* and register the object with the BrowseClass object. The BrowseClass object then calls the registered EditTextClass object's methods as needed. See *Control Templates—BrowseUpdateButton*s for more information.

EditTextClass Source Files

The EditTextClass source code is installed by default to the Clarion \LIBSRC folder. The specific EditTextClass source code and their respective components are contained in:

ABEIP.INC	EditTextClass declarations
ABEIP.CLW	EditTextClass method definitions

EditTextClass Properties

The EditTextClass inherits all the properties of the EditClass from which it is derived. See EditClass Properties and EditClass Concepts for more information.

In addition to the inherited properties, the EditTextClass contains the following properties:

Title (text dialog title text)

Title CSTRING(256)

The **Title** property contains a string that sets the title bar text in the dialog containing the text control.

Implementation: The EditTextClass (TakeEvent method) uses the Title property as the title text for the titlebar of the dialog containing the text control.

See Also: TakeEvent

EditTextClass Methods

The EditTextClass inherits all the methods of the EditClass from which it is derived. See EditClass Methods *and* EditClass Concepts.

EditTextClass: Functional Organization—Expected Use

As an aid to understanding the EditTextClass it is useful to organize its methods into two large categories according to their expected use—the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EditTextClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[VI]	initialize the EditTextClass object
Kill[VI]	shut down the EditTextClass object

Mainstream Use:

TakeEvent[VI]	handle events for the edit control

Occasional Use:

CreateContol[V]	create the edit (COMBO) control
SetAlerts[VI]	alert keystrokes for the edit control

[V] These methods are also virtual.
[I] These methods are inherited from the EditClass

Virtual Methods

Typically you will not call these methods directly—the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[I]	initialize the EditTextClass object
CreateContol	create the edit COMBO control
SetAlerts[I]	alert keystrokes for the edit control
TakeEvent[I]	handle events for the edit control
Kill[I]	shut down the EditTextClass object

CreateControl (create the edit-in-place control:EditTextClass)

CreateControl, VIRTUAL, PROTECTED

The **CreateControl** method creates the edit-in-place COMBO control.

Implementation: The Init method calls the CreateControl method. The CreateControl method creates a COMBO control with an ellipsis button.

Use the Init method or the CreateControl method to set any required properties of the COMBO control.

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: FEQ, EditClass.CreateControl

TakeEvent (process edit-in-place events:EditTextClass)

TakeEvent(*event* **), VIRTUAL**

TakeEvent Processes an event for the EditTextClass object.

event An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the EditTextClass object and returns a value indicating the user requested action. Valid actions are none, complete or OK, cancel, next record, previous record, next field, and previous field.

Implementation: The EIPManager.TakeFieldEvent method calls the TakeEvent method. The TakeEvent method processes an EVENT:AlertKey for the edit-in-place control. On EVENT:DroppingDown, TakeEvent invokes a Windwo with a text control. Finally, TakeEvent returns a value indicating the user requested action.

Corresponding EQUATEs for the possible edit-in-place actions are declared in ABEIP.INC as follows:

```
EditAction ITEMIZE(0),PRE
None       EQUATE   ! no action
Forward    EQUATE   ! next field
Backward   EQUATE   ! previous field
Complete   EQUATE   ! OK
Cancel     EQUATE   ! cancel
Next       EQUATE   ! next record
Previous   EQUATE   ! previous record
Ignore     EQUATE   ! no action
           END
```

Return Data Type: BYTE

Example:

```
EditClassAction ROUTINE
  CASE SELF.EditList.Control.TakeEvent(EVENT())
  OF EditAction:Forward   !handle tab forward (new field, same record)
  OF EditAction:Backward  !handle tab backward (new field, same record)
  OF EditAction:Next      !handle down arrow (new record, offer to save prior record)
  OF EditAction:Previous  !handle up arrow (new record, offer to save prior record)
  OF EditAction:Complete  !handle OK or enter key (save record)
  OF EditAction:Cancel    !handle Cancel or esc key (restore record)
  END
```

See Also: Init

EIPManagerClass

EIPManagerClass--Overview

The EIPManagerClass is a WindowManager that displays an edit-in-place dialog, and handles events for that dialog . The EIPManagerClass is an abstract class--it is not useful by itself, but serves as the foundation and framework for the BrowseEIPManagerClass. See *BrowseEIPManagerClass*.

EIPManagerClass Concepts

Each edit-in-place control is created on top of the browse from which it is called. The EIPManager dynamically creates an edit-in-place object and control upon request (Insert, Change, or Delete) by the end user. When the end user accepts the edited record the EIPManager destroys the edit-in-place object and control.

EIPManagerClass--Relationship to Other Application Builder Classes

WindowClass

The EIPManager class is derived from the WindowManager class.

BrowseClass

Each BrowseClass utilizing edit-in-place requires an BrowseEIPManager to manage the events and processes that are used by each edit-in-place field in the browse.

The BrowseClass.AskRecord method is the calling method for edit-in-place functionality.

EditClasses

The EIPManager provides the basic or "under the hood" interface between the Edit classes and the Browse class. The EIPManager uses the EditQueue to keep track of the fields in the browse utilizing edit-in-place.

EIPManagerClass--ABC Template Implementation

The Browse template declares a BrowseEIPManager when the BrowseUpdateButtons control template enables default edit-in-place support for the BrowseBox.

See *Control Templates--BrowseBox* and *BrowseUpdateButton*s for more information.

EIPManagerClass Source Files

The EIPManagerClass source code is installed by default to the Clarion \LIBSRC folder. The specific EIPManagerClass source code and their respective components are contained in:

ABEIP.INC	EditClass declarations
ABEIP.CLW	EditClass method definitions
ABEIP.TRN	EditClass translation strings

EIPManagerClass--Conceptual Example

The following example shows a sequence of statements to declare, and instantiate an EIPManager object. The example page-loads a LIST of actions and associated priorities, then edits the list items via edit-in-place. Note that the BrowseClass object references the BrowseEIPManager which is an EIPManager object, as referenced in ABBrowse.INC.

```
   PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

   INCLUDE('ABBROWSE.INC'),ONCE
   INCLUDE('ABEIP.INC'),ONCE
   INCLUDE('ABWINDOW.INC'),ONCE
   MAP
   END

Actions              FILE,DRIVER('TOPSPEED'),PRE(ACT),CREATE,BINDABLE,THREAD
KeyAction                KEY(ACT:Action),NOCASE,OPT
Record                   RECORD,PRE()
Action                      STRING(20)
Priority                    DECIMAL(2)
Completed                   DECIMAL(1)
                         END
                     END

Access:Actions       &FileManager
Relate:Actions       &RelationManager
GlobalErrors         ErrorClass
GlobalRequest        BYTE(0),THREAD
ActionsView   VIEW(Actions)
              END

Queue:Browse  QUEUE
ACT:Action      LIKE(ACT:Action)
ACT:Priority    LIKE(ACT:Priority)
ViewPosition    STRING(1024)
              END
BrowseWindow WINDOW('Browse Records'),AT(0,0,247,140),SYSTEM,GRAY
               LIST,AT(5,5,235,100),USE(?List),IMM,HVSCROLL,MSG('Browsing Records'),|
               FORMAT('80L~Action~@S20@8R~Priority~L@N2@'),FROM(Queue:Browse)
               BUTTON('&Insert'),AT(5,110,40,12),USE(?Insert),KEY(InsertKey)
               BUTTON('&Change'),AT(50,110,40,12),USE(?Change),KEY(CtrlEnter),DEFAULT
               BUTTON('&Delete'),AT(95,110,40,12),USE(?Delete),KEY(DeleteKey)
              END
```

```
ThisWindow  CLASS(WindowManager)
Init                        PROCEDURE(),BYTE,PROC,DERIVED
Kill                        PROCEDURE(),BYTE,PROC,DERIVED
            END

BRW1 CLASS(BrowseClass)
Q    &Queue:Browse
Init PROCEDURE(SIGNED ListBox,*STRING Posit,VIEW V,QUEUE Q,RelationManager RM,WindowManager WM)
     END

BRW1::EIPManager     BrowseEIPManager      ! EIPManager for Browse using ?List

  CODE
  GlobalErrors.Init
  Relate:Actions.Init
  GlobalResponse = ThisWindow.Run()
  Relate:Actions.Kill
  GlobalErrors.Kill


ThisWindow.Init PROCEDURE

ReturnValue          BYTE,AUTO
  CODE
  SELF.Request = GlobalRequest
  ReturnValue =PARENT.Init()
  IF ReturnValue THEN RETURN ReturnValue.
  SELF.FirstField = ?List
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  SELF.AddItem(Toolbar)
  CLEAR(GlobalRequest)
  CLEAR(GlobalResponse)
  Relate:Actions.Open
  FilesOpened = True
  BRW1.Init(?List,Queue:Browse.ViewPosition,BRW1::View:Browse,Queue:Browse,Relate:Actions,SELF)
  OPEN(BrowseWindow)
  SELF.Opened=True
  BRW1.Q &= Queue:Browse
  BRW1.AddSortOrder(,ACT:KeyAction)
  BRW1.AddLocator(BRW1::Sort0:Locator)
  BRW1::Sort0:Locator.Init(,ACT:Action,1,BRW1)
  BRW1.AddField(ACT:Action,BRW1.Q.ACT:Action)
  BRW1.AddField(ACT:Priority,BRW1.Q.ACT:Priority)
  BRW1.ArrowAction = EIPAction:Default+EIPAction:Remain+EIPAction:RetainColumn
  BRW1.InsertControl=?Insert
  BRW1.ChangeControl=?Change
  BRW1.DeleteControl=?Delete
```

```
  BRW1.AddToolbarTarget(Toolbar)
  SELF.SetAlerts()
  RETURN ReturnValue


ThisWindow.Kill PROCEDURE

ReturnValue          BYTE,AUTO
  CODE
  ReturnValue =PARENT.Kill()
  IF ReturnValue THEN RETURN ReturnValue.
  IF FilesOpened
    Relate:Actions.Close
  END
  RETURN ReturnValue



BRW1.Init|
PROCEDURE(SIGNED ListBox,*STRING Posit,VIEW V,QUEUE Q,RelationManagerRM,WindowManager WM)

  CODE
  PARENT.Init(ListBox,Posit,V,Q,RM,WM)
  SELF.EIP &= BRW1::EIPManager    ! Browse object's reference to the BrowseEIPManager
```

EIPManagerClass Properties

Again (column usage flag)

Again BYTE, PROTECTED

The **Again** property contains a value that indicates whether or not the current edit-in-place column has been selected by the user during an edit-in-place process.

The TakeEvent method is where the Again property receives a value.

Arrow (edit-in-place action on arrow key)

Arrow &BYTE

The **Arrow** property is a reference to a BYTE which indicates the action to take when the end user presses the up or down arrow key during an edit-in-place process.

Note: The Arrow property should be treated as a PROTECTED property except during initialization.

Implementation: When the EIPManager is instantiated from a browse the Arrow property will point to the BrowseClass.ArrowAction.

See Also: BrowseClass.ArrowAction

Column (listbox column)

Column UNSIGNED

The **Column** property contains a value that indicates the column number of the listbox field which currently has focus in an edit-in-place process.

Enter (edit-in-place action on enter key)

```
Enter    &BYTE
```

The **Enter** property is a reference to the BrowseClass.EnterAction property, and indicates the action to take when the end user presses the ENTER key during an edit-in-place process.

Note: The Enter property should be treated as a PROTECTED property except during initialization.

See Also: BrowseClass.EnterAction

EQ (list of edit-in-place controls)

```
EQ       &EditQueue
```

The **EQ** property is a reference to a structure containing a list of browse list columns that will not utilize the default edit-in-place control. This list includes columns that will not utilize edit-in-place.

Implementation: The AddControl method adds browse list columns to the EQ property. An entry without an associated control indicates a column that has been specified as non-edit-in-place.

You do not need to initialize this property to implement the default edit-in-place controls. The EQ property supports custom edit-in-place controls.

The EQ property is a reference to a QUEUE declared in ABEdit.INC as follows:

```
EditQueue    QUEUE,TYPE
Field       UNSIGNED
FreeUp       BYTE
Control      &EditClass
  END
```

Note: The EQ property should be treated as a PROTECTED property except during initialization.

See Also: AddControl

Fields (managed fields)

Fields &FieldPairsClass, PROTECTED

The **Fields** property is a reference to the FieldPairsClass object that moves and compares data between the BrowseClass object's FILE and the EditClasses.

Note: The Fields property should be treated as a PROTECTED property except during initialization.

See Also: BrowseClass.TabAction

FocusLoss (action on loss of focus)

FocusLoss &BYTE

The **FocusLoss** property is a reference to the BrowseClass.FocusLossAction property, and indicates the action to take with regard to pending changes when the edit control loses focus during an edit-in-place process.

Note: The FocusLoss property should be treated as a PROTECTED property except during initialization.

See Also: BrowseClass.TabAction, BrowseClass.FocusLossAction

Insert (placement of new record)

Insert BYTE

The **Insert** property indicates where in the list a new record will be added when the end user inserts a new record. The default placement is below the selected record.

Implementation: There are three places a new record can be placed in a list when using edit-in-place: above the selected record; below the selected record (the default); or appended to the bottom of the list.

Note: This does not change the sort order. After insertion, the list is resorted and the new record appears in the proper position within the sort sequence.

The specified placements are implemented by the BrowseEIPManager.Init method. Set the record insertion point by assigning, adding, or subtracting the following EQUATEd values to Insert. The following EQUATEs are in ABEdit.INC:

```
  ITEMIZE,PRE(EIPAction)
Default  EQUATE(0)
Always   EQUATE(1)
Never    EQUATE(2)
Prompted EQUATE(4)
Save     EQUATE(7)
Remain   EQUATE(8)
Before   EQUATE(9)    ! insert before/above selected record
Append   EQUATE(10)   ! insert at the bottom of the list
RetainColumn   EQUATE(16)
  END
```

See Also: BrowseEIPManager.Init

ListControl (listbox control number)

ListControl SIGNED

The **ListControl** property contains the control number of the LIST control that is utilizing edit-in-place.

Note: The ListControl property should be treated as a PROTECTED property except during initialization.

See Also: BrowseClass.TabAction

LastColumn (previous edit-in-place column)

LastColumn BYTE, PROTECTED

The **LastColumn** property contains the column number of the previously used edit-in-place control to facilitate the appropriate processing of a NewSelection.

Implementation: The LastColumn method is assigned the value of the Column property in the ResetColumn method.

Repost (event synchronization)

Repost UNSIGNED, PROTECTED

The **Repost** property indicates the appropriate event to post to the edit-in-place control based on events posted from the browse procedure window.

Implementation: The TakeEvent and TakeFieldEvent methods assign the appropriate value to the Repost property. The Kill method posts the specified event to the appropriate edit-in-place control based on the value contained in the RepostField property.

See Also: RepostField

RepostField (event synchronization field)

RepostField UNSIGNED, PROTECTED

The **RepostField** property contains the field control number of the listbox field that is being edited.

Implementation: The TakeFieldEvent method assigns the appropriate value to the RepostField property. The Kill method posts the specified event to the appropriate edit-in-place control based on the value contained in the RepostField property.

See Also: Repost

Req (database request)

Req BYTE, PROTECTED

The **Req** property indicates the database action the procedure is handling. The EIPManager uses this property to make appropriate processing decisions with regard to priming records, saving or abandoning changes, etc.

Implementation: The Run method is passed a parameter which contains the value assigned to the Req property.

See Also: WindowManager.Request

SeekForward (get next field flag)

SeekForward BYTE, PROTECTED

The **SeekForward** property indicates that the end user has pressed the TAB key during an edit-in-place process.

Implementation: The TakeAction method conditionally assigns a value of one (1) to the SeekForward property based on the actions of the end user.

See Also: Next

Tab (action on a tab key)

Tab &BYTE

The **Tab** property is a reference to the BrowseClass.TabAction property that indicates the action to take when the end user presses the TAB key during an edit-in-place process.

Note: The Tab property should be treated as a PROTECTED property except during initialization.

See Also: BrowseClass.TabAction

EIPManagerClass Methods

EIPManagerClass--Functional Organization--Expected Use

As an aid to understanding the EIPManagerClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the EIPManagerClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Run	run this procedure
Init[D]	initialize the EditClass object
InitControls	initialize edit-in-place controls
Kill[D]	shut down the EditClass object

Mainstream Use:

TakeAcceptAll	handle all validation settings
TakeEvent[D]	handle events for the edit control
TakeNewSelection[D]	handle Event:NewSelection

Occasional Use:

AddControl	register edit-in-place controls
ClearColumn[V]	reset column property values
CreateContol[V]	a virtual to create the edit control
GetEdit[V]	identify edit-in-place field
Next	get the next edit-in-place field
ResetColumn[V]	reset edit-in-place object to selected field
SetAlerts[V]	alert appropriate keystrokes for the edit control
TakeAction[V]	process end user actions
TakeCompleted[V]	process completion of edit
TakeFocusLoss[V]	process loss of focus
TakeFieldEvent[D]	handle field specific events

[D] These methods are also derived.
[V] These methods are also virtual.

Virtual and Derived Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are either derived or virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init[D]	initialize the EditClass object
Kill [D]	shut down the EditClass object
TakeEvent[D]	handle events for the edit control
TakeNewSelection[D]	handle Event:NewSelection
ClearColumn[V]	reset column property values
CreateContol[V]	a virtual to create the edit control
GetEdit[V]	identify edit-in-place field
ResetColumn[V]	reset edit-in-place object to selected field
SetAlerts[V]	alert appropriate keystrokes for the edit control
TakeAction[V]	process end user actions
TakeCompleted[V]	process completion of edit
TakeFocusLoss[V]	process loss of focus
TakeFieldEvent[D]	handle field specific events

AddControl (register edit-in-place controls)

AddControl([*EditClass*], *Column*, *AutoFree*)

AddControl	Specifies an edit-in-place control.
EditClass	The label of the EditClass. If omitted, the specified *column* is not editable.
Column	An integer constant, variable, EQUATE, or expression that indicates the browse list column to edit with the specified *editclass* object.
AutoFree	A numeric constant, variable, EQUATE, or expression that indicates whether the BrowseClass.Kill method DISPOSEs of the *editclass* object. A zero (0) value leaves the object intact. A non-zero value DISPOSEs the object.

The **AddControl** method specifies the *editclass* that defines the edit-in-place control for the browse *column*. Use *autofree* with caution; you should only DISPOSE of memory allocated with a NEW statement. See the *Language Reference* for more information on NEW and DISPOSE.

The AddControl method also registers fields which will not be editable via edit-in-place. In this instance the EditClass parameter is omitted.

Implementation: The InitControls and BrowseClass.AddEditControl methods call the AddControl method. The BrowseClass.AddEditControl method defines the *editclass* for a column not utilizing the default *editclass.*

The AddControl method ADDs a record containing the values of *EditClass*, *Column*, and *AutoFree*, to the EditQueue which is declared in ABEdit.INC as follows:

```
EditQueue QUEUE,TYPE
Field      UNSIGNED
FreeUp     BYTE
Control    &EditClass
           END
```

Example:

```
BrowseClass.AddEditControl PROCEDURE(EditClass EC,UNSIGNED Id,BYTE Free)
  CODE
    SELF.CheckEIP
    SELF.EIP.AddControl(EC,Id,Free)
```

See Also: EQ, InitControls, BrowseClass.AddEditControl

ClearColumn (reset column property values:EIPManagerClass)

ClearColumn, VIRTUAL

The **ClearColumn** method checks for a value in the LastColumn property and conditionally sets the column values to zero (0).

The TakeAction and TakeNewSelection methods call the ClearColumn method.

Example:

```
EIPManager.TakeNewSelection PROCEDURE   ! Must be overridden to handle out-of-row click
  CODE
  IF FIELD() = SELF.ListControl AND KEYCODE() = MouseLeft  ! An in-row mouse click
    SELF.ClearColumn
    SELF.Column = SELF.ListControl{PROPLIST:MouseUpField}
    SELF.ResetColumn
  END
  RETURN Level:Benign
```

See Also: Column, TakeAction, TakeNewSelection

GetEdit (identify edit-in-place field)

GetEdit, VIRTUAL, PROTECTED

The **GetEdit** method checks for a value in the Control field of the EditQueue.

Implementation: GetEdit is called by the Next method, and returns one (1) if any value is in the Control field of the EditQueue, otherwise it returns zero (0).

Return Data Type: BYTE

Example:

```
EIPManager.Next PROCEDURE
  CODE

  GET(SELF.EQ,RECORDS(SELF.EQ))
? ASSERT(~ERRORCODE())
  LastCol=SELF.EQ.Field

  LOOP
    CLEAR(SELF.EQ)
    SELF.EQ.Field = SELF.Column
    GET(SELF.EQ,SELF.EQ.Field)
    IF ~ERRORCODE() AND SELF.GetEdit()
      BREAK
    END
  !executable code
```

See Also: EQ, Next

Init (initialize the EIPManagerClass object)

Init, DERIVED, PROC

The **Init** method initializes the EIPManagerClass object.

Implementation: The BrowseEIPManager.Init method calls the Init method. The Init method primes variables and calls the InitControls method which then initializes the appropriate edit-in-place controls.

Return Data Type: BYTE

Example:

```
BrowseEIPManager.Init    ! initialize BrowseEIPManagerClass object
!program code
RETURN PARENT.Init()     ! call to the EIPManager.Init
```

See Also: BrowseEIPManager.Init, InitControls

InitControls (initialize edit-in-place controls)

InitControls, VIRTUAL

The **InitControls** method registers the default edit-in-place controls with the EIPManager by calling the AddControl method, and initializes each added control.

Implementation: The Init method calls the InitControls method. The InitControls method checks for custom edit-in-place controls in the EditQueue before adding a default edit-in-place control.

Example:

```
EIPManager.Init PROCEDURE
  CODE
  IF SELF.Column = 0 THEN SELF.Column = 1.
  SELF.LastColumn = 0
  SELF.Repost = 0
  SELF.RepostField = 0
  ASSERT(~SELF.EQ &= NULL)
  SELF.EQ.Field = 1

  SELF.InitControls
  SELF.ResetColumn
  RETURN Level:Benign
```

See Also: Init, EQ, AddControl

Kill (shut down the EIPManagerClass object)

Kill, DERIVED, PROC

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code. The Kill method must leave the object in a state in which an Init can be called.

Implementation: The BrowseEIPManager.Kill method calls the Kill method with a PARENT call. The Kill method destroys the edit-in-place controls created by the InitControls method.

Return Data Type: BYTE

Example:

```
BrowseEIPManager.Kill PROCEDURE
  CODE
  SELF.BC.ResetFromAsk(SELF.Req,SELF.Response)
  RETURN PARENT.Kill()
```

See Also: BrowseEIPManager.Kill

Next (get the next edit-in-place field)

Next, PROTECTED

The **Next** method gets the next edit-in-place control in the direction specified (forward or backward) by the end user.

Implementation: The Next method loops through the EditQueue and gets the next edit-in-place control based on the RETURN value of the GetEdit method.

Example:

```
EIPManager.ResetColumn PROCEDURE
  CODE
  SETKEYCODE(0)
  SELF.Next
  IF SELF.Column <> SELF.LastColumn
    SELF.ListControl{PROP:Edit,SELF.EQ.Field} = SELF.EQ.Control.Feq
    SELECT(SELF.EQ.Control.Feq)
    SELF.LastColumn = SELF.Column
  END
```

See Also: GetEdit, SeekForward, Column, EQ

ResetColumn (reset edit-in-place object to selected field)

ResetColumn, VIRTUAL, PROTECTED

The **ResetColumn** method selects the appropriate edit-in-place control based on the selected listbox field.

Implementation: The ResetColumn method resets the FEQ to the selected ListControl field.

Example:

```
EIPManager.TakeCompleted PROCEDURE(BYTE Force)
  CODE
  SELF.Column = 1
  IF SELF.Again
     SELF.ResetColumn
  END
```

See Also: EditClass.FEQ

Init, ListControl, TakeAction, TakeCompleted, TakeNewSelection

Run (run the EIPManager)

Run(*request*)

Run Run the EIPManager.

request An integer constant, variable, EQUATE, or expression identifying the database action (insert, change, delete) requested.

The **Run** method assigns the passed value to the Req property and executes the EIPManager.

Implementation: Return value EQUATEs are declared in \LIBSRC\TPLEQU.CLW as follows:

```
RequestCompleted     EQUATE (1)          !Update Completed
RequestCancelled     EQUATE (2)          !Update Cancelled
```

Return Data Type: BYTE

Example:

```
BrowseClass.AskRecord PROCEDURE(BYTE Req)
  CODE
  SELF.CheckEIP
  RETURN SELF.EIP.Run(Req)
```

See Also: Req

TakeAcceptAll (validate completed row)

TakeAcceptAll ( ), VIRTUAL

TakeAcceptAll Processes edit-in-place validation.

When an Edit-in-Place row is completed, the **TakeAcceptAll** method will validate and reselect any column that is required and empty, or any column that returns an EditAction:Cancel equate by the EditClass:TakeAccepted method, with the exception of any cancel action performed during an Insert or Change session. If all columns are successfully validated, TakeAcceptAll returns TRUE (1).

Return Value: BYTE

TakeAction (process edit-in-place action)

TakeAction(*action*), VIRTUAL

TakeAction	Processes edit-in-place action.
action	An integer constant, variable, EQUATE, or expression that contains the action to process. Valid EQUATEs are forward, backward, next, previous, complete, and cancel.

The **TakeAction** method processes an EIPManager dialog action. The TakeAction method is your opportunity to interpret and implement the meaning of the end user's selection.

Implementation: The TakeFieldEvent conditionally calls the TakeAction method.

Corresponding EQUATEs are declared in ABEIP.INC as follows:

```
EditAction ITEMIZE(0),PRE
None     EQUATE
Forward  EQUATE   ! Next field
Backward EQUATE   ! Previous field
Complete EQUATE   ! OK
Cancel   EQUATE   ! Cancel
Next     EQUATE   ! Focus moving to Next record
Previous EQUATE   ! Focus moving to Previous record
Ignore   EQUATE
       END
```

Example:

```
EIPManager.TakeFieldEvent        PROCEDURE
I UNSIGNED(1)
  CODE
  IF FIELD() = SELF.ListControl THEN RETURN Level:Benign .
  LOOP I = 1 TO RECORDS(SELF.EQ)+1
   ! Optimised to pick up subsequent events from same field
    IF ~SELF.EQ.Control &= NULL AND SELF.EQ.Control.Feq = FIELD()
      SELF.TakeAction(SELF.EQ.Control.TakeEvent(EVENT()))
      RETURN Level:Benign
    END
    GET(SELF.EQ,I)
  END
  ! Code to handle an unknown field
```

See Also: TakeFieldEvent

TakeCompleted (process completion of edit:EIPManagerClass)

TakeCompleted(*force*), VIRTUAL

TakeCompleted Determines the edit-in-place dialog's action after either a loss of focus or an end user action.

action An integer constant, variable, EQUATE, or expression that indicates an end user requested action.

The **TakeCompleted** method conditionally calls the ResetColumn method. The BrowseEIPManager.TakeCompleted provides the bulk of the process completion functionality, and is derived from the TakeCompleted method.

Implementation: The BrowseEIPManager.TakeCompleted method calls the TakeCompleted method via PARENT syntax. TakeFocusLoss and TakeAction also call the TakeCompleted method.

Note: TakeCompleted does not override the WindowManager.TakeCompleted method.

Example:

```
EIPManager.TakeFocusLoss PROCEDURE
 CODE
 CASE CHOOSE(SELF.FocusLoss&=NULL,EIPAction:Default,BAND(SELF.FocusLoss,EIPAction:Save)
 OF EIPAction:Always OROF EIPAction:Default
   SELF.TakeCompleted(Button:Yes)
 OF EIPAction:Never
   SELF.TakeCompleted(Button:No)
 ELSE
   SELF.TakeCompleted(0)
 END
```

See Also: BrowseEIPManager.TakeCompleted, TakeFocusLoss, TakeAction

TakeEvent (process window specific events)

TakeEvent, DERIVED, PROC

The **TakeEvent** method processes window specific events and returns Level:Notify for an EVENT:Size, EVENT:Iconize, or EVENT:Maximize; it returns a Level:Fatal for an EVENT:CloseDown, EVENT:CloseWindow, or EVENT:Sized; all other window events return a Level:Benign.

Implementation: The TakeFieldEvent method calls the TakeEvent method. The TakeEvent method calls the TakeFocusLoss method subsequent to returning a Level:Fatal.

Return Data Type: BYTE

Example:

```
EIPManager.TakeFieldEvent        PROCEDURE
I UNSIGNED(1)
  CODE
  IF FIELD() = SELF.ListControl THEN RETURN Level:Benign .
  LOOP I = 1 TO RECORDS(SELF.EQ)+1
   ! Optimised to pick up subsequent events from same field
    IF ~SELF.EQ.Control &= NULL AND SELF.EQ.Control.Feq = FIELD()
      SELF.TakeAction(SELF.EQ.Control.TakeEvent(EVENT()))
      RETURN Level:Benign
    END
    GET(SELF.EQ,I)
  END
  ! Code to handle an unknown field
```

See Also: TakeFieldEvent, TakeFocusLoss

TakeFieldEvent (process field specific events)

TakeFieldEvent, DERIVED, PROC

The **TakeFieldEvent** method processes all field-specific/control-specific events for the window. It returns a value indicating whether edit-in-place process is complete and should stop.

TakeFieldEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The WindowManager.TakeEvent method calls the TakeFieldEvent method.

Return value EQUATEs are declared in ABERROR.INC.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

TakeFocusLoss (a virtual to process loss of focus)

TakeFocusLoss, VIRTUAL

The **TakeFocusLoss** method determines the appropriate action to take when the EIPManager window loses focus, and calls the TakeCompleted method with the appropriate parameter.

Implementation: TakeEvent and TakeFieldEvent methods conditionally call the TakeFocusLoss method.

Example:

```
EIPManager.TakeFieldEvent        PROCEDURE
I UNSIGNED(1)
  CODE
  IF FIELD() = SELF.ListControl THEN RETURN Level:Benign .
  LOOP I = 1 TO RECORDS(SELF.EQ)+1
   ! Optimized to pick up subsequent events from same field
    IF ~SELF.EQ.Control &= NULL AND SELF.EQ.Control.Feq = FIELD()
      SELF.TakeAction(SELF.EQ.Control.TakeEvent(EVENT()))
      RETURN Level:Benign
    END
    GET(SELF.EQ,I)
  END
  ! Code to handle an unknown field
```

See Also: TakeCompleted

TakeNewSelection (reset edit-in-place column:EIPManagerClass)

TakeNewSelection, DERIVED, PROC

The **TakeFieldEvent** method resets the edit-in-place column selected by the end user.

Implementation: TakeNewSelection is called by the BrowseEIPManager.TakeNewSelection method.

TakeNewSelection calls ResetColumn, and returns a Level:Benign.

Return Data Type: BYTE

Example:

```
BrowseEIPManager.TakeNewSelection PROCEDURE
  CODE
  IF FIELD() = SELF.ListControl
    IF CHOICE(SELF.ListControl) = SELF.BC.CurrentChoice
      RETURN PARENT.TakeNewSelection()
    ELSE
   ! Code to handle Focus change to different record
  END
 END
```

See Also: ResetColumn

EntryLocatorClass

EntryLocatorClass Overview

The EntryLocatorClass is a LocatorClass with an input control (ENTRY, COMBO, or SPIN). An Entry Locator is a multi-character locator that activates when the locator control is *accepted* (not upon each keystroke).

Use an Entry Locator when you want a multi-character search on numeric or alphanumeric keys and you want to delay the search until the user accepts the locator control. This delayed search reduces network traffic and provides a smoother search in a client-server environment.

EntryLocatorClass Concepts

The EntryLocatorClass lets you specify a locator control and a sort field on which to search (the free key element) for a BrowseClass object. The BrowseClass object uses the EntryLocatorClass to locate and scroll to the nearest matching item.

When the end user places one or more characters in the locator control, then *accepts* the control by pressing TAB, pressing a locator button, or selecting another control on the screen, the EntryLocatorClass object advances the BrowseClass object's LIST to the nearest matching record.

EntryLocatorClass Relationship to Other Application Builder Classes

The BrowseClass uses the EntryLocatorClass to locate and scroll to the nearest matching item. Therefore, if your program's BrowseClass objects use an Entry Locator, your program must instantiate the EntryLocatorClass for each use. Once you register the EntryLocatorClass object with the BrowseClass object (see BrowseClass.AddLocator), the BrowseClass object uses the EntryLocatorClass object as needed, with no other code required. See the *Conceptual Example*.

EntryLocatorClass ABC Template Implementation

The ABC BrowseBox template generates code to instantiate the EntryLocatorClass for your BrowseBoxes. The EntryLocatorClass objects are called BRW*n*::Sort#:Locator, where *n* is the template instance number and # is the sort sequence (id) number. As this implies, you can have a different locator for each BrowseClass object sort order.

You can use the BrowseBox's **Locator Behavior** dialog (the **Locator Class** button) to derive from the EntryLocatorClass. The templates provide the derived class so you can modify the locator's behavior on an instance-by-instance basis.

EntryLocatorClass Source Files

The EntryLocatorClass source code is installed by default to the Clarion \LIBSRC folder. The specific EntryLocatorClass source code and their respective components are contained in:

ABBROWSE.INC	EntryLocatorClass declarations
ABBROWSE.CLW	EntryLocatorClass method definitions

EntryLocatorClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a BrowseClass object and related objects, including an EntryLocatorClass object. The example initializes and page-loads a LIST, then handles a number of associated events, including scrolling, updating, and locating records.

Note that the WindowManager and BrowseClass objects internally handle the normal events surrounding the locator.

```
   PROGRAM
   INCLUDE('ABWINDOW.INC')              !declare WindowManager class
   INCLUDE('ABBROWSE.INC')              !declare BrowseClass and Locator
   MAP
   END
State        FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey  KEY(ST:STATECODE),NOCASE,OPT
Record        RECORD,PRE()
STATECODE      STRING(2)
STATENAME      STRING(20)
              END
             END
StView    VIEW(State)               !declare VIEW to process
          END
StateQ       QUEUE                  !declare Q for LIST
ST:STATECODE  LIKE(ST:STATECODE)
ST:STATENAME  LIKE(ST:STATENAME)
ViewPosition  STRING(512)
             END
Access:State CLASS(FileManager)     !declare Access:State object
Init         PROCEDURE
             END
Relate:State CLASS(RelationManager) !declare Relate:State object
Init         PROCEDURE
             END
VCRRequest  LONG(0),THREAD
```

```
StWindow WINDOW('Browse States'),AT(,,123,152),IMM,SYSTEM,GRAY
       PROMPT('Find:'),AT(9,6)
       ENTRY(@s2),AT(29,4),USE(ST:STATECODE)
       LIST,AT(8,5,108,124),USE(?StList),IMM,HVSCROLL,FROM(StateQ),|
       FORMAT('27L(2)|M~CODE~@s2@80L(2)|M~STATENAME~@s20@')
      END

ThisWindow CLASS(WindowManager)         !declare ThisWindow object
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END
BrowseSt   CLASS(BrowseClass)           !declare BrowseSt object
Q          &StateQ
           END

StLocator  EntryLocatorClass            !declare StLocator object
StStep     StepStringClass              !declare StStep object


CODE
 ThisWindow.Run()                      !run the window procedure

ThisWindow.Init  PROCEDURE()           !initialize things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()           !call base class init
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Init                     !initialize Relate:State object
 SELF.FirstField = ?ST:STATECODE       !set FirstField for ThisWindow
 SELF.VCRRequest &= VCRRequest         !VCRRequest not used
 Relate:State.Open                     !open State and related files
 !Init BrowseSt object by naming its LIST,VIEW,Q,RelationManager & WindowManager
 BrowseSt.Init(?StList,StateQ.ViewPosition,StView,StateQ,Relate:State,SELF)
 OPEN(StWindow)
 SELF.Opened=True
 BrowseSt.Q &= StateQ                  !reference the browse QUEUE
 StStep.Init(+ScrollSort:AllowAlpha,ScrollBy:Runtime)!initialize the StStep object
 BrowseSt.AddSortOrder(StStep,ST:StateCodeKey)           !set the browse sort order
 BrowseSt.AddLocator(StLocator)                          !plug in the browse locator
 StLocator.Init(?ST:STATECODE,ST:STATECODE,1,BrowseSt)   !initialize locator object
 BrowseSt.AddField(ST:STATECODE,BrowseSt.Q.ST:STATECODE) !set a column to browse
 BrowseSt.AddField(ST:STATENAME,BrowseSt.Q.ST:STATENAME) !set a column to browse
 SELF.SetAlerts()                      !alert any keys for ThisWindow
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()           !shut down things
ReturnValue    BYTE,AUTO
```

```
CODE
ReturnValue = PARENT.Kill()          !call base class shut down
IF ReturnValue THEN RETURN ReturnValue.
Relate:State.Close                   !close State and related files
Relate:State.Kill                    !shut down Relate:State object
GlobalErrors.Kill                    !shut down GlobalErrors object
RETURN ReturnValue
```

EntryLocatorClass Properties

EntryLocatorClass Properties

The EntryLocatorClass inherits all the properties of the LocatorClass from which it is derived. See *LocatorClass Properties* and *LocatorClass Concepts* for more information.

In addition to the inherited properties, the EntryLocatorClass also contains the following property:

Shadow (the search value)

Shadow CSTRING(40)

The **Shadow** property contains the search value for the entry locator.

The TakeKey method adds to the search value based on the end user's keyboard input. The BrowseClass.TakeAcceptedLocator method implements the search for the specified value.

See Also: TakeKey, BrowseClass.TakeAcceptedLocator

EntryLocatorClass Methods

The EntryLocatorClass inherits all the methods of the LocatorClass from which it is derived. See *LocatorClass Methods* and *LocatorClass Concepts* for more information.

GetShadow(return shadow value)

GetShadow, DERIVED

The **GetShadow** method returns the value of the Shadow property. The Shadow property is set based on the users keyboard input into the entry locator field.

Return Data Type: STRING

See Also: EntryLocatorClass.SetShadow, EntryLocatorClass.Shadow

Init (initialize the EntryLocatorClass object)

Init([*control*] , *freeelement* [,*ignorecase*] [,*browseclass*] **)**

Init	Initializes the EntryLocatorClass object.
control	An integer constant, variable, EQUATE, or expression that sets the locator control for the locator. If omitted, the control number defaults to zero (0) indicating there is no locator control.
freeelement	The fully qualified label of a component of the sort sequence of the searched data set. The ABC Templates further require this to be a free component of a key. A free component is one that is not range limited to a single value. Typically this is also the USE variable of the locator control.
ignorecase	An integer constant, variable, EQUATE, or expression that determines whether the locator does case sensitive searches or ignores case. A value of one (1) or True does case insensitive searches; a value of zero (0) or False ignores case. If omitted, nocase defaults to 0.
browseclass	The label of the BrowseClass object for the locator. If omitted, the LocatorClass object has no direct access to the browse QUEUE or it's underlying VIEW.

The **Init** method initializes the EntryLocatorClass object.

Implementation: The Init method sets the values of the Control, FreeElement, NoCase, and ViewManager properties. The Shadow property is the *control*'s USE variable.

By default, only the StepLocatorClass and FilterLocatorClass use the *browseclass*. The other locator classes do not.

Example:

```
BRW1::Sort1:Locator.Init(,CUST:StateCode,1)             !without locator control
BRW1::Sort2:Locator.Init(?CUST:CustMo,CUST:CustNo,1)    !with locator control
```

See Also: Control, FreeElement, NoCase, ViewManager

Set (restart the locator:EntryLocatorClass)

Set, DERIVED

The **Set** method prepares the locator for a new search.

Implementation: The Set method clears the FreeElement property and the Shadow property.

Example:

```
MyBrowseClass.TakeScroll PROCEDURE(SIGNED Event)   !process a scroll event
 CODE
 !handle the scroll
 SELF.PostNewSelection               !post EVENT:NewSelection to list
 IF ~SELF.Sort.Locator &= NULL       !if locator is present
  SELF.Sort.Locator.Set              ! clear it
 END
 IF SELF.Sort.Thumb &= NULL          !if thumb is present
  SELF.UpdateThumbFixed              ! reposition it
 END
```

See Also: FreeElement, Shadow

SetShadow(set shadow value)

SetShadow(***shadow***), DERIVED

SetShadow	Set the Shadow property.
shadow	A string constant, variable, EQUATE, or expression that contains the value to give to the Shadow property.

The **SetShadow** property sets the Shadow property with the passed **value.**

See Also: EntryLocatorClass.GetShadow, EntryLocatorClass.Shadow

TakeAccepted (process an accepted locator value:EntryLocatorClass)

TakeAccepted, DERIVED

The **TakeAccepted** method processes the accepted locator value and returns a value indicating whether the browse list display should change.

A locator value is accepted when the end user changes the locator value, then TABS off the locator control or otherwise switches focus to another control on the same window.

Implementation: The TakeAccepted method primes the FreeElement property with the entered search value, then returns one (1 or True) if a new search is required or returns zero (0 or False) if no new search is required.

Return Data Type: BYTE

Example:

```
MyBrowseClass.TakeAcceptedLocator PROCEDURE
 CODE
 IF ~SELF.Sort.Locator &= NULL          !if locator is present
  IF SELF.Sort.Locator.TakeAccepted()   !if locator value requires a search
   SELF.Reset(1)                        !reposition the view
   SELECT(SELF.ListControl)             !focus on the list control
   SELF.ResetQueue( Reset:Done )        !reset the browse queue
   SELF.Sort.Locator.Reset              !reset the locator USE variable
  END
END
```

See Also: FreeElement

TakeKey (process an alerted keystroke:EntryLocatorClass)

TakeKey, DERIVED

The **TakeKey** method processes an alerted keystroke for the LIST control that displays the data to be searched and returns a value indicating whether the browse list display should change. **By default, all alphanumeric keys are alerted for LIST controls.**

Implementation: The BrowseClass.TakeKey method calls the locator TakeKey method. The TakeKey method stuffs the keystroke detected by the LIST into the locator's input control and returns zero (0 or False).

Return Data Type: BYTE

Example:

```
MyBrowseClass.TakeKey PROCEDURE
  CODE
 IF RECORDS(SELF.ListQueue)
  CASE KEYCODE()
  OF InsertKey OROF DeleteKey OROF CtrlEnter OROF MouseLeft2  ;!handle keys
  ELSE
   DO CheckLocator   !handle all other keystrokes
  END
 END
 RETURN 0

CheckLocator ROUTINE
 IF ~(SELF.Sort.Locator &= NULL)
  IF SELF.Sort.Locator.TakeKey()        !add keystroke to locator input control
   SELF.Reset(SELF.GetFreeElementPosition()) !and refresh browse if necessary
   SELF.ResetQueue(Reset:Done)
   DO HandledOut
  ELSE
   IF RECORDS(SELF.ListQueue)
    DO HandledOut
   END
  END
 END

HandledOut ROUTINE
 SELF.UpdateWindow
 SELF.PostNewSelection
 RETURN 1
```

See Also: BrowseClass.TakeKey

Update (update the locator control and free elements)

Update, PROTECTED, VIRTUAL

The **Update** method redraws the locator control and updates the free key elements in the record buffer with the current locator value.

Implementation: The Update method primes the FreeElement property with the current search value (the Shadow property), then calls the UpdateWindow method to redraw the locator control.

Example:

```
MyBrowseClass.UpdateWindow PROCEDURE        !update browse related controls
 CODE
 IF ~(SELF.Sort.Locator &= NULL)            !if locator is present
  SELF.Sort.Locator.UpdateWindow            !redraw locator control
 END
```

See Also: FreeElement, Shadow, UpdateWindow

UpdateWindow (redraw the locator control)

UpdateWindow, DERIVED

The **UpdateWindow** method redraws the locator control with the current locator value.

Implementation: The Update method calls the UpdateWindow method to redraw the locator control with the current locator contents.

Example:

```
MyBrowseClass.UpdateWindow PROCEDURE        !update browse related controls
 CODE
 IF ~(SELF.Sort.Locator &= NULL)            !if locator is present
  SELF.Sort.Locator.UpdateWindow            ! redraw locator control
 END
```

See Also: Update

ErrorClass

ErrorClass Overview

The ErrorClass declares an error manager which consistently and flexibly handles any errors. That is, for a given program scope, you define all possible errors by ID number, severity, and message text, then when an error or other notable condition occurs, you simply pass the appropriate ID to the error manager which processes it appropriately based on its severity level.

The defined "errors" may actually include questions, warnings, notifications, messages, benign tracing calls, as well as true errors. The ErrorClass comes with about forty general purpose database errors already defined. You can expand this list to include additional general purpose errors, your own application-specific errors, or even field specific data validation errors. Your expansion of the errors list may be "permanent" or may be done dynamically at runtime.

Overview of ErrorClass changes in Clarion 6.1

In Clarion version 5.5 and prior, the Error Class was designed to be a Global class, using just one instance of the class in a program (EXE or EXE with multi DLL) that would be used by the entire application. This was possible because the previous thread model did not allow two different threads to use the global ErrorClass at the same time. With the incorporation of the new thread model in Clarion 6, this limitation disappears, and it is now possible that the global ErrorClass can be used by two different threads at the same time.

In the first release (Clarion 6.0), the ErrorClass was changed to a THREADed Class. This change made it safe to be used in a preemptive thread environment.

There are other possible designs that could have been used. Another approach that could have been taken would be to add thread synchronization to the class. Yet another design approach is to divide the class into two classes: one class contains thread dependent data and the other contains thread independent data. This is the design approach that has been implemented in version 6.1.

If a class has some data that needs to be thread specific and other data that does not, there are several design options that need to be considered.

For thread independent data, a solution is to add some kind of synchronization to the class (e.g., CriticalProcedure) in order to prevent two different threads from accessing these values at the same time. Of course, care must be used in that the data and scope where we use it should maintain this synchronization.

For the thread dependent data, one solution is to move the threaded data to a synchronized queue that stores the data, using the thread number as the queue's key. Another solution (and the one used with Clarion 6.1) is to create a *new* class (ErrorStatusClass) that is specifically used as a *container* for the thread dependent data. This second option is equivalent to working with only *one* class (the ErrorClass) that has threaded *and* non-threaded parts. The thread dependent part will create and destroy a new instance for each thread and the thread independent part stores the "thread independent ID" of the thread dependent part so it can use it with the associated thread number in order to get the correct reference to the threaded class for a specific thread.

Because any access to the threaded class parts will need to be done using some function that first retrieves the correct class reference, the changes made in the ErrorClass for version 6.1 emulates this implementation, where all access to the key property attributes are now done through an associated pair of GET*propertyname* and SET*propertyname* methods, where *propertyname* is the property that is affected.

Sometimes these GET/SET methods are used to wrap the synchronized object, and other times they control the access to the specific threaded class' properties or queues.

Also, these changes to the ErrorClass simplify its use in multi DLL applications, because the global ErrorClass is consistent for each thread, and synchronization is straightforward.

Also, this change maintains the ability to customize errors in only one place and use them throughout the application. A single queue is used to store the error list, so extra memory is not required by additional threads. All methods are declared in the non-threaded class, so only a single instance of these methods is loaded in memory. Access to the global class is implemented in such a way that the addition of the synchronization methods will not slow down the application's performance.

ErrorClass Source Files

The ErrorClass source code is installed by default to the Clarion \LIBSRC. The specific ErrorClass source code and their respective components are contained in:

ABERROR.INC	ErrorClass declarations
ABERROR.CLW	ErrorClass method definitions
ABERROR.TRN	ErrorClass default error definitions

Multiple Customizable Levels of Error Treatment

Six Levels of Treatment

By default, the error manager recognizes six different levels of error severity. The default actions for these levels range from no action for benign errors to halting the program for fatal errors. The error manager also supports the intermediate actions of simply notifying the user, or of notifying the user and letting the user decide whether to continue or abort.

Customizable Treatments

These various levels of treatment are implemented with virtual methods so they are easy to customize. The error manager calls a different virtual method for each severity level, so you can override the default error actions with your own application specific error actions. See the various *Take* methods for examples.

The recognized severity EQUATEs are declared in ABERROR.INC. These severity levels and their default actions are:

Level:Benign	no action, returns Level:Benign
Level:User	displays message, returns Level:Benign or Level:Cancel
Level:Notify	displays message, returns Level:Benign
Level:Fatal	displays message, halts the program
Level:Program	treated as Level:Fatal
Level:Cancel	used to confirm no action taken by User
any other value	treated as Level:Program

You may define your own additional severity levels *and* their associated actions.

Predefined Windows and Database Errors

A list of common database errors are defined in ABERROR.TRN for your use and for the ABC Templates. The defined "errors" include questions, warnings, messages, notifications, benign tracing calls, as well as true errors.

You may edit these error definitions to suit your own requirements. That is, you may add new error definitions, change the wording of the error message text, or even translate the English text to another language.

Note: If you use the ABC Templates you should not remove any of the default error definitions or change their ID numbers.

Dynamic Extensibility of Errors

You may add new error definitions, override default error definitions, and modify default error definitions at runtime with the methods provided for these purposes:

AddErrors	Adds new errors, overrides errors, or both.
RemoveErrors	Removes errors, restores overridden errors, or both.
SetFatality	Modifies the severity level of an error.

ErrorClass ABC Template Implementation

The ABC Templates instantiate a global ErrorClass object called GlobalErrors. All template recognized errors are defined at program startup and almost every generated procedure then relies on the GlobalErrors object to handle known error conditions. You can use the Application Template's Global Properties dialog to specify a different class to instantiate as GlobalErrors--providing complete flexibility for error handling in your template generated procedures.

ErrorClass Relationship to Other Application Builder Classes

All the classes that access files (ASCIIFileClass, ASCIIViewerClass, FileManager, RelationManager, ViewManager, and BrowseClass) use the ErrorClass. Therefore, if your program instantiates any of these classes, it must also instantiate the ErrorClass.

ErrorClass Macro Expansion

The following ErrorClass methods allow runtime customization of error message text through expansion of macro symbols:

SetField	Names the field that produced the error.
SetFile	Names the file that produced the error.
ThrowFile	Names the file that produced the error, then handles the error.
ThrowMessage	Modifies error text, then handles the error.

Each error has associated message text. The error message text may contain macro symbols recognized by the ErrorClass object. The ErrorClass object expands these macro symbols to their current runtime values before displaying the message. Supported macros and their runtime substitution values are:

%File	The ErrorClass.FileName property
%Field	The ErrorClass.FieldName property
%Message	The ErrorClass.MessageText property
%Error	Value returned by ERROR()
%ErrorCode	Value returned by ERRORCODE()
%FileError	Value returned by FILEERROR()
%FileErrorCode	Value returned by FILEERRORCODE()
%ErrorText	%Error(%ErrorCode) *or* %FileError(%FileErrorCode)
%Previous	Text from prior defined error with the same id

The %ErrorText macro uses %FileError(%FileErrorCode)--the more specific backend server error information--when it is available, otherwise it uses %Error(%ErrorCode).

This macro expansion capability is a feature of the ErrorClass and is not a feature of the Clarion language in general.

Tip: You do not need to specify two percent signs (%%) to display a percent sign (%) in your message text.

ErrorClass Multi-Language Capability

Because all error message text is defined in one place (ABERROR.TRN), it is easy to implement non-English error messages. For static (permanent) language translation, simply translate the English text in ABERROR.TRN to the language of your choice. Alternatively, for dynamic language translation, you may add an error definition block to ABERROR.TRN for each supported language. For example in ABERROR.TRN declare:

```
DefaultErrors  GROUP    !English error messages
               END
GermanErrors   GROUP    !German error messages
               END
```

Then at runtime, initialize the error manager with the appropriate error definition block. For example, you could override the Init method (defined in ABERROR.CLW) with something like this:

```
  INCLUDE('ABERROR.INC')               !declare ErrorClass
MyErrorClass  CLASS(ErrorClass)        !declare derived class
Init            PROCEDURE(BYTE PreferredLanguage)
              END

GlobalErrors      MyErrorClass         !declare GlobalErrors object
Language          BYTE                 !Language Flag
Language:English  EQUATE(0)            !English equate
Language:German   EQUATE(1)            !German equate

  CODE
  Language = GETINI('Preferences','Language',0)  !get language preference
  GlobalErrors.Init(Language)                    !GlobalErrors initialization
                                                 !with preferred language


MyErrorClass.Init PROCEDURE(BYTE PreferredLanguage)  !New Init method
  CODE
  SELF.Errors &= NEW ErrorEntry        !allocate new Errors list
  CASE PreferredLanguage               !which language was selected
  OF Language:German                   !if German
    SELF.AddErrors(GermanErrors)       !add German errors to list
  ELSE                                 !otherwise...
    SELF.AddErrors(DefaultErrors)      !add default (English) errors
  END
```

Alternatively, you could call the AddErrors method to define *additional* errors for the selected language as shown in the following example.

ErrorClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate an ErrorClass object.

```
     PROGRAM
     INCLUDE('ABERROR.INC')              !include ErrorClass declarations

AppErrors GROUP                          !declare app specific errors
Number   USHORT(2)                       !number of errors in this group
       USHORT(Msg:DuplicateKey)          !first error ID
       BYTE(Level:Notify)                !severity level
       PSTRING('Duplicate Key')          !window title
       PSTRING('%File key is invalid.')  !message text with macro
       USHORT(Msg:FieldOutOfRange)       !second error ID
       BYTE(Level:Notify)                !severity level
       PSTRING('Range Error')            !window title
       PSTRING('%Field must be between %Message.') !message text
     END

GlobalErrors ErrorClass                  !declare GlobalErrors object

 CODE
 GlobalErrors.Init                       !initialize (add default errors)
 GlobalErrors.AddErrors(AppErrors)       !add app specific errors
 GlobalErrors.SetFatality(Msg:DuplicateKey,Level:Fatal) !modify severity of an error
 !
 !program code
 !
 !user attempts to enter invalid month value...
 GlobalErrors.SetField('Month')           !set %Field for macro expansion
 GlobalErrors.ThrowMessage(Msg:FieldOutOfRange,'1 and 12')!pass error to errormanager
 !
 !user attempts to insert a duplicate key...
 GlobalErrors.SetFile('Customer')         !set %File for macro expansion
 GlobalErrors.Throw(Msg:DuplicateKey)     !pass error to errormanager
 !program code
 !
 GlobalErrors.Kill                        !shut down GlobalErrors object
```

ErrorClass Properties

ErrorClass Properties

There are two types of ErrorClass properties, the Errors list and the macro substitution values. The most important property is the Errors list--the list of errors recognized by ErrorClass. The defined "errors" may actually include questions, warnings, notifications, benign tracing calls, as well as true errors. This list is established by the ErrorClass initialization method, ErrorClass.Init. The list may be modified thereafter by methods provided for this purpose, allowing application specific errors (such as field specific invalid data messages).

The other three ErrorClass properties support the error text "macros" recognized by the error manager. The error manager expands these macro symbols to their current runtime values before displaying the message.

DefaultCategory (error category)

DefaultCategory **ASTRING, PRIVATE**

The **DefaultCategory** is a string that is a classification of the type of error. This property is set by the SetCategory. The Init method sets the DefaultCategory to 'ABC'. When the category is changed by SetCategory, the new category becomes the default category.

This property is private, but can be accessed through the SetDefaultCategory and GetDefaultCategory methods.

See Also:
ErrorClass.Init, ErrorClass.SetCategory, ErrorClass.GetCategory, SetDefaultCategory, GetDefaultCategory

ErrorLog (errorlog interface)

ErrorLog &ErrorLogInterface, PROTECTED

The **ErrorLog** property is a reference to the errorlog interface that manages the error log file.

Errors (recognized error definitions)

Errors &ErrorEntry, PRIVATE

The **Errors** property is a reference to the data structure that holds all errors recognized by the ErrorClass. The defined "errors" may actually include questions, warnings, messages, notifications, benign tracing calls, as well as true error conditions.

The default errors are defined in ABERROR.TRN. You may edit ABERROR.TRN to customize the default error list. The Init method adds these default error definitions to the Errors property at runtime. You may also use the SetFatality method, the AddErrors method, and the RemoveErrors method to customize the Errors property at runtime.

The SetFatality method changes the severity level of a specified error.

The AddErrors method lets you add more error definitions, override existing error definitions, or both. The Errors property may have more than one error with the same ID. Error definitions added later "override" any earlier definitions with the same IDs. The "overridden" definitions are preserved for substitution into the %Previous macro symbol.

The RemoveErrors method lets you remove error definitions, restore previously overridden errors, or both.

The error message text may contain "macros" recognized by the error manager. The error manager expands these macro symbols to their current runtime values before displaying the message. See *Macro Expansion* for more information.

Implementation: Errors is a reference to a queue declared in ABERROR.INC as follows. For each recognized error, the Errors property includes an ID number, error message text, window title text, and a severity indicator.

```
ErrorEntry QUEUE,TYPE        !List of all error definitions
Id          USHORT           !Error message identifier
Message     &STRING          !Message text
Title       &STRING          !Error window caption bar text
Fatality    BYTE             !Severity of error
           END
```

See Also: AddErrors, Init, RemoveErrors, SetFatality

FieldName (field that produced the error)

FieldName CSTRING(MessageMaxlen), PRIVATE

The **FieldName** property contains the name of the field that produced the error. The SetField method sets the value of the FieldName PRIVATE property, which is now part of the ErrorStatusGroup. The FieldName value replaces any %Field symbols within the error message text.

MessageMaxlen is a constant EQUATE declared in ABERROR.INC.

See Also: SetField

FileName (file that produced the error)

FileName CSTRING(MessageMaxlen), PRIVATE

The **FileName** property contains the name of the file that produced the error. The SetFile and ThrowFile methods both set the value of the FileName PRIVATE property, which is now part of the ErrorStatusGroup. The FileName value then replaces any %File symbols within the error message text.

MessageMaxlen is a constant EQUATE declared in ABERROR.INC.

See Also: SetFile, ThrowFile

History (error history structure)

History &ErrorHistoryList,PROTECTED

The **History** property is a reference to the ErrorHistoryList structure that holds the history for errors that have previously occurred. The error History is determined based on the HistoryThreshold and HistoryResetOnView properties.

HistoryResetOnView(clear error history log file)

HistoryResetOnView BYTE, PRIVATE

The **HistoryResetOnView** property determines if the error history view structure should be cleared upon viewing an error message. If this property is set to one (1 or True), the History structure will be reset after each error is viewed. Setting this property to zero (0 or False) will cause the errors to be queued in the History structure.

This property is now private, and is set through the SetHistoryResetOnView and GetHistoryResetOnView ErrorClass methods.

HistoryThreshold (determine size of error history)

HistoryThreshold LONG, PRIVATE

The **HistoryThreshold** property sets the number of items to store in the error log file. Setting this property to -1 keeps all errors. Setting this property to 0 switches off error history logging.

This property is now private, and is set through the SetHistoryThreshold and GetHistoryThreshold methods.

HistoryViewLevel (trigger error history)

HistoryViewLevel LONG, PRIVATE

The **HistoryViewLevel** property sets the error level which triggers error history viewing. This property is only valid with a HistoryThreshold other than 0.

Use the following equates to set the error level. You can also set this property in the Application Generator Global Classes dialog:

Level:Benign	no action, returns Level:Benign
Level:User	displays message, returns Level:Benign or Level:Cancel
Level:Notify	displays message, returns Level:Benign
Level:Fatal	displays message, halts the program
Level:Program	treated as Level:Fatal
Level:Cancel	used to confirm no action taken by User

This property is now private, and is set through the SetHistoryViewLevel and GetHistoryViewLevel methods.

KeyName (key that produced the error)

KeyName CSTRING(MessageMaxlen), PRIVATE

The **KeyName** property contains the name of the key that produced the error. The SetKey method sets the value of the KeyName PRIVATE property, which is not part of the ErrorStatusGroup. The KeyName value then replaces any %Key symbols within the error message text.

MessageMaxlen is a constant EQUATE declared in ABERROR.INC.

See Also: SetKey

LogErrors (turn on error history logging)

LogErrors BYTE, PRIVATE

The **LogErrors** property turns the error history logging on or off. Setting this property to one (1 or True) turns on the error logging. Setting this property to zero (0 or False) turns off the error logging.

This property is now private, and is set through the SetLogErrors and GetLogErrors methods.

MessageText (custom error message text)

MessageText CSTRING(MessageMaxlen), PRIVATE

The **MessageText** property contains text to substitute for any %Message symbols within the error message text. The ThrowMessage method sets the value of the MessageText PRIVATE property, which is now a part of the ErrorStatusGroup. The MessageText value then replaces any %Message symbols within the error message text.

MessageMaxlen is a constant EQUATE declared in ABERROR.INC.

See Also: ThrowMessage

Silent (silent error flag)

Silent BYTE, PRIVATE

The **Silent** property determines whether an error will be displayed to the screen. If Silent is set to one (1 or True), the error message box will not be displayed to the screen; however it will be added to the error log file. If Silent is set to zero, (0 or False) the error is displayed to the screen as well as added to the error log file.

This property is now private, and is set through the SetSilent and GetSilent methods.

ErrorClass Methods

ErrorClass Functional Organization--Expected Use

As an aid to understanding the ErrorClass, it is useful to organize the various ErrorClass methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ErrorClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the ErrorClass object
AddErrors	add or override recognized error definitions
SetFatality	change the severity level of a specific error
Kill	terminate the ErrorClass object

Mainstream Use:

Throw	process an error
ThrowFile	set substitution value of %File then process an error
ThrowMessage	set substitution value of %Message then process an error
Message	display an error message from the Errors list

Occasional Use:

SetField	set the substitution value of the %Field macro
SetFile	set the substitution value of the %File macro
SetErrors	save the current error state
SetId	make a selected error the current one
RemoveErrors	remove (and/or restore) error definitions
TakeError	process an error, assuming SetErrors has been called

Virtual Methods

Typically, you will not call these methods directly--the Non-Virtual methods call them. We anticipate you will want to override these methods, and because they are virtual, they are very easy to override. However they do provide reasonable default behavior in case you do not want to override them. These methods are listed functionally rather than alphabetically.

TakeBenign	process benign errors
TakeNotify	process notify errors
TakeUser	process user errors
TakeFatal	process fatal errors
TakeProgram	process program errors
TakeOther	process any other errors

AddErrors (add or override recognized errors)

AddErrors(*error block* **), VIRTUAL**

AddErrors	Adds entries to the Errors property from the *error block* passed to it.
error block	A GROUP whose first component field is a USHORT containing the number of error entries in the GROUP. Subsequent component fields define the error entries.

The **AddErrors** method receives error entries and adds them to the existing Errors property. These later added Error definitions "override" any earlier definitions with the same IDs. The "overridden" definitions are preserved for substitution into the %Previous macro symbol, and may be fully restored by removing the overriding error entries with the RemoveErrors method.

Implementation: AddErrors assumes the Errors property has already been created by Init or by some other method.

Each *error block* entry consists of a USHORT containing the error ID, a BYTE containing the severity level, a PSTRING containing the title to display on the error message window, and another PSTRING containing the error message text.

Example:

```
AppErrors GROUP
Number     USHORT(2)                          !number of errors in the group
           USHORT(Msg:RebuildKey)             !first error ID
           BYTE(Level:Notify)                 !severity level
           PSTRING('Invalid Key')             !window title
           PSTRING('%File key is invalid.')   !message text
           USHORT(Msg:RebuildFailed)          !second error ID
           BYTE(Level:Fatal)                  !severity level
           PSTRING('Key was not built')       !window title
           PSTRING('Repairing key for %File.')!message text
          END
GlobalErrors ErrorClass                       !declare GlobalErrors object
 CODE
 GlobalErrors.Init                            !GlobalErrors initialization
 GlobalErrors.AddErrors(AppErrors)            !add some app specific errors
 Main                                         !call main procedure
 GlobalErrors.Kill                            !GlobalErrors termination
```

See Also: Init, Errors, RemoveErrors

AddHistory (update History structure)

AddHistory, VIRTUAL

The **AddHistory** method adds an entry to the History structure. This structure is used to display the message to the screen.

GetCategory (retrieve error category)

GetCategory(*[Id]*)

GetCategory Retrieves the current error category.

id An integer constant, variable, EQUATE, or expression that indicates the error id.

The **GetCateogry** method retrieves the error category from the ErrorEntry structure. If the *id* is omitted the DefaultCategory is returned.

Return Data Type: ASTRING

GetDefaultCategory (get default error category)

GetDefaultCategory( )

GetDefaultCategory Retrieves the current default error category.

The **GetDefaultCategory** method retrieves the current default error category set by the DefaultCategory property.

Return Data Type: ASTRING

See Also: SetDefaultCategory

GetError (Retrieve the current error message)

GetError([*errorlevel*])

GetError	Retrieves the current error message.
errorlevel	An integer constant, variable, EQUATE, or expression that indicates the error level.

The **GetError** method retrieves the error message from the SaveError or SaveFileError property, based on the type of *errorlevel* that is detected.

Return Data Type: CSTRING

GetErrorcode (Retrieve the current Errorcode)

GetErrorcode([*errorlevel*])

GetErrorcode	Retrieves the current error code
errorlevel	An integer constant, variable, EQUATE, or expression that indicates the error level.

The **GetErrorcode** method retrieves the error code from the SaveErrorCode or SaveFileErrorCode property, based on the type of errorlevel detected.

Return Data Type: LONG

GetFieldName (get field that produced the error)

GetFieldName( )

GetFieldName	Returns the name of the field that produced the error.

GetFieldName returns the name of the file that produced the error. The SetField method sets the value of the ErrorStatusGroup **FieldName** private property. The **FieldName** value then replaces any %Field symbols within the error message text.

Return Data Type: STRING

See Also: SetFieldName, FieldName

GetFileName (get file that produced the error)

GetFileName( )

GetFileName Returns the name of the file that produced the error.

GetFileName returns the name of the file that produced the error. The SetFile and ThrowFile methods both set the value of the ErrorStatusGroup **FileName** private property. The **FileName** value then replaces any %File symbols within the error message text.

Return Data Type: STRING

See Also: SetFileName, FileName

GetHistoryResetOnView (get the error reset mode)

GetHistoryResetOnView ( )

GetHistoryResetOnView Retrieves the current status of clearing the error history on view.

GetHistoryResetOnView retrieves the value of the ErrorClass **HistoryResetOnView** private property.

If the value returned is one (1 or True), this indicates that the History structure will be reset after each error is viewed. If the value returned is zero (0 or False) this indicates that the errors are queued in the History structure after viewing.

Return Data Type: BYTE

See Also: SetHistoryResetOnView, HistoryResetOnView

GetHistoryThreshold (get size of error history)

GetHistoryThreshold( )

GetHistoryThreshold Retrieves the current mode of error log history.

GetHistoryThreshold retrieves the value of the of the ErrorClass private property, which sets the number of items to store in the error log file.

A value of -1 keeps all errors. A value of 0 means the error history logging is currently off.

Return Data Type: LONG

See Also: SetHistoryThreshold

GetHistoryViewLevel (get error history viewing mode)

GetHistoryViewLevel ( )

GetHistoryViewLevel Returns the active error level set for error history viewing.

GetHistoryViewLevel returns the value of the ErrorClass **HistoryViewLevel** private property.

This value is used to set the error level that will trigger error history viewing. This value is only valid if the HistoryThreshold property is set to any value other than 0.

Return Data Type: LONG

See Also: SetHistoryViewLevel

GetKeyName (get key name that produced the error)

GetKeyName( )

GetKeyName Returns the name of the key that produced the error.

GetKeyName returns the name of the key that produced the error. The SetKey method sets the value of the ErrorStatusGroup **KeyName** private property. The **KeyName** value then replaces any %Key symbols within the error message text.

Return Data Type: STRING

See Also: SetKeyName, KeyName

GetLogErrors (get state of error log)

GetLogErrors( )

GetLogErrors Retrieves the current mode of error log activity.

GetLogErrors retrieves the value of the ErrorClass **LogErrors** private property.

A value of one (1 or True) means that error logging is active. A value of zero (0 or False) means that error logging is inactive (off).

Return Data Type: BYTE

See Also: SetLogErrors, LogErrors

GetMessageText (get current error message text)

GetMessageText( )

GetMessageText Returns the message text of the current active error.

GetMessageText returns the text to substitute for any %Message symbols within the error message text. This value then replaces any %Message symbols within the error message text.

Return Data Type: STRING

See Also: SetMessageText

GetProcedureName (return procedure name)

GetProcedureName

The **GetProcedureName** method returns the name of the procedure in which it has been called.

Implementation: Returns the name of the procedure as established in t he .APP file providing that the procedure name has been added to a PRIVATE queue by the SetProcedureName method. The GetProcedureName method is not called by any other methods or templates.

Return Data Type: STRING

```
MESSAGE(GlobalErrors.GetProcedureName()) ! Displays the procedure name in
! a MESSAGE dialog
```

See Also: SetProcedureName

GetSilent (get silent error flag)

GetSilent( )

GetSilent	Retrieves the current state of error display mode.

GetSilent retrieves the value of the ErrorClass **Silent** private property.

The **Silent** property determines whether an error will be displayed to the screen. If Silent is set to one (1 or True), the error message box will not be displayed to the screen; however it will be added to the error log file. If Silent is set to zero, (0 or False) the error is displayed to the screen as well as added to the error log file.

Return Data Type: BYTE

See Also: SetSilent

HistoryMsg (initialize the message window)

HistoryMsg(*caption***,** *icon***,** *buttons***,** *default button***), PROC, VIRTUAL**

HistoryMsg	Initialize the message box window and controls.
caption	A string constant, variable, EQUATE, or expression that specifies the message box window caption.
icon	An integer constant, variable, EQUATE, or expression that indicates the icon to display on the message box.
buttons	An integer constant, variable, EQUATE, or expression that indicates which Windows standard buttons to place on the message box. This may indicate multiple buttons.
default button	An integer constant, variable, EQUATE, or expression that indicates the default button on the message box.

The **HistoryMsg** method initializes the error message dialog.

Return Data Type: LONG

Init (initialize the ErrorClass object)

Init
Init(*errorlog***), VIRTUAL**

Init	Initialize the ErrorClass object.
errorlog	The label of the ErrorLogInterface.

The **Init** method initializes the ErrorClass object and adds the default errors.

Implementation: Creates the Errors property and calls the AddErrors method to initialize it with the default errors defined in ABERROR.TRN. Default error ID EQUATEs are defined in ABERROR.INC.

The standard templates instantiate a single global ErrorClass object and make a single global call to Init. However, you may wish to instantiate an ErrorClass object with a separate set of errors for each base class, or for any other logical entity (for example a PayrollErrors object for the Payroll segment of your program).

Example:

```
GlobalErrors ErrorClass    !declare GlobalErrors object
 CODE
 GlobalErrors.Init         !GlobalErrors initialization
 Main                      !call main procedure
 GlobalErrors.Kill         !GlobalErrors termination
```

See Also: AddErrors, Errors, Kill

Kill (perform any necessary termination code)

Kill

The **Kill** method disposes any memory allocated during the object's lifetime and performs any other necessary termination code.

Implementation: Disposes the Errors queue created by the Init method.

Example:

```
GlobalErrors ErrorClass  !declare GlobalErrors object
 CODE
 GlobalErrors.Init       !GlobalErrors initialization
 Main                    !call main procedure
 GlobalErrors.Kill       !GlobalErrors termination
```

See Also: Init

Message (display an error message)

Message(*error id, buttons, default button* **)**

Message	Displays an error message dialog box and returns the button the user pressed.
error id	An integer constant, variable, EQUATE, or expression that indicates which ErrorClass.Errors message to show in the dialog box.
buttons	An integer constant, variable, EQUATE, or expression that indicates which Windows standard buttons to place on the dialog box. This may indicate multiple buttons.
default button	An integer constant, variable, EQUATE, or expression that indicates the default button on the dialog box.

The **Message** method displays a Windows-standard message box containing the error message text from the Errors property, and returns the number of the button the user presses to exit the dialog box. This method provides a simple, centrally maintainable, consistent way to display messages.

Implementation: Uses the MESSAGE statement to display an application modal window with a question icon, the caption defined in the Errors property, and the message text defined in the Errors property.

The ABERROR.INC file contains a list of default symbolic constants for the *error id* parameter.

The EQUATES.CLW file contains symbolic constants for the *buttons* and *default button* parameters. The EQUATEs are:

BUTTON:OK
BUTTON:YES
BUTTON:NO
BUTTON:ABORT
BUTTON:RETRY
BUTTON:IGNORE
BUTTON:CANCEL
BUTTON:HELP

Return Data Type: LONG

Example:

```
!attempted auto increment of key has failed,
!show Message box with Yes and No buttons, the default is No
GlobalErrors.SetErrors     !Set value of %ErrorText macro
IF GlobalErrors.Message(Msg:RetryAutoInc,BUTTON:Yes+BUTTON:No,BUTTON:No) = BUTTON:Yes
 CYCLE
END
```

Msg (initiate error message destination)

Msg(*txt***,** [*caption*]**,** [*icon*]**,** [buttons]**,** *[default button]* **,** [*style*]), PROC, VIRTUAL, PROTECTED

Msg	Initiates the destination of the error message.
txt	A string constant, variable, EQUATE, or expression that contains the error message text to display in the message box.
caption	A string constant, variable, EQUATE, or expression that specifies the message box window caption.
icon	An integer constant, variable, EQUATE, or expression that indicates the icon to display on the message box.
buttons	An integer constant, variable, EQUATE, or expression that indicates which Windows standard buttons to place on the message box. This may indicate multiple buttons. If omitted this is equivalent to Button:OK.
default button	An integer constant, variable, EQUATE, or expression that indicates the default button on the message box.
style	An integer constant, variable, EQUATE, or expression that indicates the font style to use withing the lixt control on the message box dialog.

The **Msg** method initiates the error destination. If the error is to be written to the error log file, the AddHistory method is called. The MessageBox method is called to display the error message to the window.

Return Data Type: LONG

MessageBox (display error message to window)

MessageBox([*Level*], *txt*, [*caption*], [*icon*], *buttons*, *default button*, *style*), VIRTUAL, PROTECTED

MessageBox	A simple MESSAGE() window to display error.
level	The default error level is Level:Benign.
txt	A string constant, variable, EQUATE, or expression that contains the error message text to display in the message box.
caption	A string constant, variable, EQUATE, or expression that specifies the message box window caption.
icon	An integer constant, variable, EQUATE, or expression that indicates the icon to display on the message box.
buttons	An integer constant, variable, EQUATE, or expression that indicates which Windows standard buttons to place on the message box. This may indicate multiple buttons. If omitted this is equivalent to Button:OK.
default button	An integer constant, variable, EQUATE, or expression that indicates the default button on the message box.
style	An integer constant, variable, EQUATE, or expression that indicates the font style to use withing the lixt control on the message box dialog.buttons

The **MessageBox** method implements a simple MESSAGE() dialog to display the error message to the window. This can be called independantly. It is also used if the ErrorClass is configured to not have a HistoryThreshold.

Return Data Type: LONG

RemoveErrors (remove or restore recognized errors)

RemoveErrors(*error block* **)**

RemoveErrors Removes the entries specified in the *error block* from the Errors property.

error block A GROUP whose first component field is a USHORT containing the number of error entries in the GROUP. Subsequent component fields define the error entries.

The **RemoveErrors** method receives error entries and deletes them from the existing Errors property.

The Errors property may contain more than one error with the same ID. Errors added later override earlier added errors with the same IDs. If you remove an overriding error definition, the "overridden" error is fully restored.

Implementation: RemoveErrors assumes the Errors property has already been created by Init or by some other method.

Each *error block* entry consists of a USHORT containing the error ID, a BYTE containing the severity level, a PSTRING containing the title to display on the error message window, and another PSTRING containing the error message text. However, RemoveErrors only considers the error ID when removing errors.

Example:

```
GlobalErrors ErrorClass                    !declare GlobalErrors object
Payroll PROCEDURE
PayErrors GROUP,STATIC
Number     USHORT(2)                       !number of errors in the group
           USHORT(Msg:RebuildKey)          !first error ID
           BYTE(Level:Notify)              !severity level
           PSTRING('Invalid Key')          !window title
           PSTRING('%File key is invalid.') !message text
           USHORT(Msg:RebuildFailed)       !second error ID
           BYTE(Level:Fatal)               !severity level
           PSTRING('Key was not built')    !window title
           PSTRING('Repairing key for %File.')  !message text
          END
 CODE
 GlobalErrors.AddErrors(PayErrors)         !add Payroll specific errors
 !process payroll
 GlobalErrors.RemoveErrors(PayErrors)      !remove Payroll specific errors
```

See Also: AddErrors, Init, Errors

ResetHistory(clear History structure)

ResetHistory

The **ResetHistory** method resets the error History structure. This can be done after the view of each error message if the ResetHistoryOnView property is set.

SetCategory (set error category)

SetCategory([*id*], *category*)

S**etCategory**	Retrieves the current error category.
id	An integer constant, variable, EQUATE, or expression that indicates the error id.
category	A string constant, variable, EQUATE, or expression that contains the category for the corresponding id

The **SetCateogry** method sets the error category in the ErrorEntry structure. If the *id* is omitted the DefaultCategory is used.

SetDefaultCategory (set default error category)

SetDefaultCategory(*category***)**

SetDefaultCategory	Sets the current default error category.
category	A string constant, variable, EQUATE, or expression that contains the default category.

The **SetCategory** method sets the default error category contained in the property.

See Also: GetDefaultCategory

SetErrors (save the error state)

SetErrors

The **SetErrors** method saves the current error state for use by the ErrorClass.

Implementation: The **SetErrors** method saves the return values from ERROR(), ERRORCODE(), FILEERROR(), and FILERERRORCODE(). The saved values are used for expansion of any %Error, %ErrorCode, %FileError, or %FileErrorCode macro symbols within the error message text.

The Throw method calls SetErrors prior to handling the specified error, therefore you only need to call the SetErrors method when you do not use the Throw method.

Example:

```
!an error occurs
GlobalErrors.SetErrors                      !save the error state
OPEN(LogFile)                               !open log (changes the error state)
Log:Text = FORMAT(TODAY(),@D1)&' '&FORMAT(CLOCK(),@T1)
ADD(LogFile)                                !write log (changes the error state)
RETURN GlobalErrors.TakeError(Msg:AddFailed)!process error with saved error state
```

See Also: Throw

SetFatality (set severity level for a particular error)

SetFatality(*error id, severity* **)**

SetFatality	Specifies the severity of a particular error in the Errors property.
error id	An integer constant, variable, EQUATE, or expression that indicates which error definition to modify.
severity	An integer constant, variable, EQUATE, or expression that indicates the severity of the error.

The **SetFatality** method specifies the severity of a particular error in the Errors property. If there is more than one error with the same *error id*, only the *last* matching error in the list is affected.

Implementation: The SetFatality method calls the SetId method to locate the specified error.

The ABERROR.INC file contains a list of default symbolic constants for the *error id* parameter. It also contains symbolic constants for the *severity* parameter. The severity EQUATEs and their default actions are:

Level:Benign	no action, returns Level:Benign
Level:User	displays message, returns Level:Benign or Level:Cancel
Level:Notify	displays message, returns Level:Benign
Level:Fatal	displays message, halts the program
Level:Program	treated as Level:Fatal
any other value	treated as Level:Program

You may define your own additional severity levels *and* their associated actions.

Example:

```
GlobalErrors ErrorClass
 CODE
 GlobalErrors.Init
 GlobalErrors.SetFatality(Msg:CreateFailed,Level:Fatal) !change severity to fatal
 CREATE(MyFile)
 IF ERRORCODE()
  GlobalErrors.SetFile('MyFile')            !specify file that failed
  GlobalErrors.Throw(Msg:CreateFailed)      !issue fatal error message
 END
```

See Also: Errors, SetId

SetField (set the substitution value of the %Field macro)

SetField(*fieldname* **)**

SetField	Sets the substitution value of the %Field macro.
fieldname	A string constant, variable, EQUATE, or expression that indicates which field produced the error.

The **SetField** method sets the substitution value of the %Field macro. This value replaces any %Field symbols within the error message text.

Implementation: Assigns the *fieldname* parameter to the ErrorClass.FieldName property.

Example:

```
!Lookup on State Code failed
GlobalErrors.SetField('State')                              !set field that failed
GlobalErrors.ThrowMessage(Msg:FieldNotInFile,'State File')  !process the error
```

See Also: FieldName

SetFieldName (set field name that produced the error)

SetFieldName(*fieldname* **)**

SetFieldName	Sets the name of the field that replaces any %Field symbols within the active error message text.
fieldname	A STRING constant, variable, EQUATE, or expression that sets the field name to use in the current error message text.

SetFieldName sets the value of the ErrorStatusGroup **FieldName** private property.

The *fieldname* value replaces any %Field symbols within the current error message text.

See Also: GetFieldName , FieldName

SetFile (set the substitution value of the %File macro)

SetFile(*filename* **)**

SetFile	Sets the substitution value of the %File macro.
filename	A string constant, variable, EQUATE, or expression that indicates which file produced the error.

The **SetFile** method sets the substitution value of the %File macro. This value replaces any %File symbols within the error message text.

The ThrowFile method sets the %File macro before processing the specified error. That is, ThrowFile combines the functionality of SetFile and Throw into a single method.

Implementation: Assigns the *filename* parameter to the ErrorClass.FileName property.

Example:

```
CREATE(MyFile)
IF ERRORCODE()                          !if error occurred
 GlobalErrors.SetFile(NAME(MyFile))   !set file that failed
 GlobalErrors.Throw(Msg:CreateFailed) !process the error
END
```

See Also: FileName, ThrowFile

SetFileName (set the file that produced the error)

SetFileName(*filename* **)**

SetFileName	Sets the name of the file that replaces any %File symbols within the active error message text.
filename	A STRING constant, variable, EQUATE, or expression that sets the file name to use in the current error message text.

SetFileName sets the value of the ErrorStatusGroup **FileName** private property.

The *filename* value replaces any %File symbols within the current error message text.

See Also: GetFileName, FileName

SetHistoryResetOnView (set error reset mode)

SetHistoryResetOnView(*flag* **)**

SetHistoryResetOnView	Specifies if the error history view structure is cleared on view.
flag	An integer constant, variable, EQUATE, or expression that sets the current reset status of the error history view.

SetHistoryResetOnView sets the value of the ErrorClass **HistoryResetOnView** private property.

The *flag* value determines if the error history view structure should be cleared upon viewing an error message. If *flag* is set to one (1 or True), the History structure will be reset after each error is viewed. Setting *flag* to zero (0 or False) will cause the errors to be queued in the History structure.

See Also: GetHistoryResetOnView, HistoryResetOnView

SetHistoryThreshold (set size of error history)

SetHistoryThreshold (*number* **)**

SetHistoryThreshold	Specifies the amount of error history items to store.
number	An integer constant, variable, EQUATE, or expression that sets the number of items to store in the error log file.

SetHistoryThreshold sets the value of the ErrorClass private property, which sets the number of items to store in the error log file.

Setting the *number* to -1 keeps all errors. Setting *number* to 0 switches off error history logging.

See Also: GetHistoryThreshold

SetHistoryViewLevel (set error history viewing mode)

SetHistoryViewLevel(*errorlevel* **)**

SetHistoryViewLevel	Specifies the error level to trigger error history.
errorlevel	An integer constant, variable, EQUATE, or expression that sets the current error level of error history.

SetHistoryViewLevel sets the value of the ErrorClass private property.

The *errorlevel* value sets the error level for viewing error history. The *errorlevel* value is only valid if the property is set to any value other than 0. Valid errorlevels are as follows:

Level:Benign	no action, returns Level:Benign
Level:User	displays message, returns Level:Benign or Level:Cancel
Level:Notify	displays message, returns Level:Benign
Level:Fatal	displays message, halts the program
Level:Program	treated as Level:Fatal
Level:Cancel	used to confirm no action taken by User

Activating this property will pop up a list box of error messages when the designated error level is posted.

See Also: GetHistoryViewLevel

SetKey (set the substitution value of the %Key macro)

SetKey(*keyname* **)**

SetKey	Sets the substitution value of the %Key macro.
keyname	A string constant, variable, EQUATE, or expression that indicates which key produced the error.

The **SetKey** method sets the substitution value of the %Key macro. This value replaces any %Key symbols within the error message text.

Implementation: Assigns the *keyname* parameter to the ErrorClass.KeyName property.

Example:

```
CASE ERRORCODE()
OF NoError
  SELF.AutoIncDone = 0
  RETURN Level:Benign
OF DupKeyErr
  IF HandleError
          IF ~SELF.HasAutoInc
            GET(SELF.File,0)      ! Flag for DUPLICATE function
          END
          LOOP I = 1 TO RECORDS(SELF.Keys)
            GET(SELF.Keys,I)
            IF DUPLICATE(SELF.Keys.Key)
              SELF.Errors.SetKey(CHOOSE(CLIP(SELF.Keys.Description)<>'',|
              CLIP(SELF.Keys.Description),SELF.Keys.Key{PROP:NAME}))
              SELF.ThrowMessage(Msg:DuplicateKey,SELF.Keys.Description)
              RETURN Level:Notify
            END
          END
        ELSE
          SELF.SetError(Msg:DuplicateKey)
        END
      ELSE
        SELF.SetError(Msg:AddFailed)
        IF HandleError
          RETURN SELF.Throw()
        END
      END
RETURN Level:Notify
```

See Also: KeyName

SetKeyName (set the key name that produced the error)

SetKeyName(*keyname* **)**

SetKeyName	Sets the name of the key that replaces any %key symbols within the active error message text.
keyname	A STRING constant, variable, EQUATE, or expression that sets the key name to use in the current error message text.

SetKeyName sets the value of the ErrorStatusGroup **KeyName** private property.

The *keyname* value replaces any %Key symbols within the current error message text.

See Also: GetKeyName, KeyName

SetId (make a specific error current)

SetId(*error id* **), PROTECTED**

SetId	Makes the specified error the current one.
error id	An integer constant, variable, EQUATE, or expression that indicates which error definition is current.

The **SetId** method makes the specified error the current one for processing by other ErrorClass methods. If more than one error definition matches the specified *error id*, the last defined error is used. This lets errors defined later override earlier defined errors with the same ID, while preserving the earlier defined errors for substitution into the %Previous macro symbol.

This method is PROTECTED, therefore, it can only be called from an ErrorClass method, or a method in a class derived from ErrorClass.

Implementation: The ABERROR.INC file contains a list of default EQUATEs for the *error id* parameter.

Example:

```
ErrorClass.TakeError PROCEDURE(SHORT Id)
  CODE
 SELF.SetId(Id)
 CASE SELF.Errors.Fatality
 OF Level:Benign
  RETURN SELF.TakeBenign()
 OF Level:User
 OROF Level:Cancel
  RETURN SELF.TakeUser()
 OF Level:Program
  RETURN SELF.TakeProgram()
 OF Level:Fatal
  RETURN SELF.TakeFatal()
 OF Level:Notify
  SELF.TakeNotify()
  RETURN Level:Notify
 ELSE
  RETURN SELF.TakeOther()
 END
```

See Also: Errors

SetLogErrors (set error log mode)

SetLogErrors(*flag* **)**

SetLogErrors Specifies the mode of error log activity.

flag An integer constant, variable, EQUATE, or expression that sets the current status of error logging.

SetLogErrors sets the value of the ErrorClass **LogErrors** private property.

The *flag* value turns the error history logging on or off. Setting this value to one (1 or True) turns on the error logging. Setting this value to zero (0 or False) turns off the error logging.

A file with the name “ABCErrors.Log” will be generated in the program folder.

Example:

```
GlobalErrors.Msg PROCEDURE(STRING Txt,<STRING Caption>,<STRING Icon>,|
LONG Buttons = Button:Ok,LONG DefaultButton = 0,LONG Style = 0)

ReturnValue          LONG,AUTO

  CODE
   SELF.SetLogErrors(TRUE)   !Turn on Error Logging
   SELF.SetSilent(TRUE)
  ReturnValue = PARENT.Msg(Txt,Caption,Icon,Buttons,DefaultButton,Style)
  RETURN ReturnValue
```

See Also: GetLogErrors

SetMessageText (set the current error message text)

SetMessageText (*message* **)**

SetMessageText	Sets the message text that replaces any %Message symbols within the active error message text.
message	A STRING constant, variable, EQUATE, or expression that sets the message text to use in the current error message text.

SetMessageText sets the value of the ErrorStatusClass **MessageText** private property.

The *message* value replaces any %Message symbols within the current error message text. The ThrowMessage method sets the value of the MessageText property. The MessageText value then replaces any %Message symbols within the error message text.

See Also: GetMessageText, MessageText

SetProcedureName (stores procedure names)

SetProcedureName([*name*])

SetProcedureName

The **SetProcedureName** method stores the name ofthe procedure, as defined in the .APP file, in a PRIVATE queue.

name A string constant, variable or EQUATE containing the name of the procedure to add to ProcName queue. If omitted, the current procedure name is deleted from the ProcName queue.

Implementation: SetProcedureName is called by the ABWindow.tpw so that every template generated procedure utilizing a window will have an entry in the ProcName queue. SetProcedureName is inserted into the Init method of the window using the %Procedure macro as the passed parameter. It is called again in the Kill method of the window, and the *name* parameter is omitted.

The ProcName queue is a PRIVATE queue declared in ABError.clw.

Example:

```
GlobalErrors.SetProcedureName('%Procedure')
```

See Also: GetProcedureName

SetSilent (set silent error flag)

SetSilent(*flag* **)**

SetSilent	Specifies the state of error display mode.
flag	An integer constant, variable, EQUATE, or expression that sets the status of the Silent property.

SetSilent sets the value of the ErrorClass **Silent** private property.

The **Silent** property determines whether an error will be displayed to the screen. If Silent is set to one (1 or True), the error message box will not be displayed to the screen; however it will be added to the error log file. If Silent is set to zero, (0 or False) the error is displayed to the screen as well as added to the error log file.

Example:

```
GlobalErrors.Msg PROCEDURE(STRING Txt,<STRING Caption>,<STRING Icon>,|
LONG Buttons = Button:Ok,LONG DefaultButton = 0,LONG Style = 0)

ReturnValue          LONG,AUTO

  CODE
  SELF.SetLogErrors(TRUE)   !Turn on Error Logging
  SELF.SetSilent(TRUE)      !Set Error Logging to Silent Mode
  ReturnValue = PARENT.Msg(Txt,Caption,Icon,Buttons,DefaultButton,Style)
  RETURN ReturnValue
```

See Also: GetSilent

SubsString (resolves error message macros)

SubsString, PROTECTED

The **SubsString** method returns the current error message text with all runtime macros resolved.

Implementation: The TakeFatal, TakeNotify, TakeUser, and Message methods call the SubsString method to resolve macros.

Return Data Type: STRING

```
ErrorClass.TakeFatal PROCEDURE
   CODE
 MESSAGE(Self.SubsString() & '  Press OK to end this application', |
  Self.Errors.Title,ICON:Exclamation,Button:OK,BUTTON:OK,0)
 HALT(0,Self.Errors.Title)
 RETURN Level:Fatal
```

See Also: FileName, FieldName, Message, MessageText, TakeFatal, TakeNotify, TakeUser

TakeBenign (process benign error)

TakeBenign, PROTECTED, VIRTUAL, PROC

The **TakeBenign** method is called when an error with Level:Benign is "Thrown" to the ErrorClass (see Throw, ThrowFile, ThrowMessage).

TakeBenign must return a severity level.

Implementation: The base class method (ErrorClass.TakeBenign) returns Level:Benign.

Return Data Type: BYTE

Example:

```
      INCLUDE('ABERROR.INC')       !declare ErrorClass
MyErrorClass CLASS(ErrorClass)     !declare derived class
TakeBenign   FUNCTION,BYTE,VIRTUAL !prototype corresponding virtual
        END
GlobalErrors MyErrorClass          !declare GlobalErrors object
 CODE
 GlobalErrors.Init                 !GlobalErrors initialization
 .
 .
 .
 GlobalErrors.Throw(Msg:NoError)  !Throw method calls SELF.TakeBenign to
                     !automatically call the derived class method
                     !rather than the base class method
 .
 .
 .

MyErrorClass.TakeBenign FUNCTION   !derived class virtual to handle benign
errors
 CODE
  !your custom code here
 RETURN Level:Benign
```

See Also: TakeError, Throw, ThrowFile, ThrowMessage

TakeError (process specified error)

TakeError(*error id* **), PROC**

TakeError	Locates the specified error, calls the appropriate method to handle it, then returns the severity level.
error id	An integer constant, variable, EQUATE, or expression that indicates which error to process.

The **TakeError** method locates the specified error, then based on its severity level calls the appropriate (Take*Level*) method to process the error, then returns the severity level.

TakeError assumes SetErrors has already been called to save the current error state.

Implementation: The ABERROR.INC file contains a list of default symbolic constants for the *error id* parameter.

By default, the error manager recognizes six different levels of error severity. The TakeError method calls a different virtual method (Take*Level*) for each severity level, which makes it easy to override the default error actions with your own application-specific error actions. The recognized severity EQUATEs are declared in ABERROR.INC. These severity levels and their default actions are:

Level:Benign	no action, returns Level:Benign
Level:User	displays message, returns Level:Benign or Level:Cancel
Level:Notify	displays message, returns Level:Benign
Level:Fatal	displays message, halts the program
Level:Program	treated as Level:Fatal
any other value	treated as Level:Program

Return Data Type: BYTE

See Also: Errors, SetErrors, TakeBenign, TakeNotify, TakeUser, TakeFatal, TakeProgram, TakeOther, Throw

TakeFatal (process fatal error)

TakeFatal, PROTECTED, VIRTUAL, PROC

The **TakeFatal** method is called when an error with Level:Fatal is "Thrown" to the ErrorClass (see Throw, ThrowFile, ThrowMessage).

TakeFatal must return a severity level (if the program is not HALTed).

Implementation: The base class method (ErrorClass.TakeFatal) displays the error message and HALTs the program. Although this method does not actually return, the RETURN statement is required to avoid compile errors.

Return Data Type: BYTE

Example:

```
       INCLUDE('ABERROR.INC')      !declare ErrorClass
MyErrorClass CLASS(ErrorClass)     !declare derived class
TakeFatal    FUNCTION,BYTE,VIRTUAL !prototype corresponding virtual
        END
GlobalErrors MyErrorClass          !declare GlobalErrors object
 CODE
 GlobalErrors.Init                 !GlobalErrors initialization
 !program code
 GlobalErrors.Throw(Msg:CreateFailed) !Throw method calls SELF.TakeFatal to
                    !automatically call the derived class method
                    !rather than the base class method
 !program code

MyErrorClass.TakeFatal FUNCTION    !derived class virtual to handle fatal
errors
 CODE
 !your custom code here
 RETURN Level:Fatal
```

See Also: TakeError, Throw, ThrowFile, ThrowMessage

TakeNotify (process notify error)

TakeNotify, PROTECTED, VIRTUAL

The **TakeNotify** method is called when an error with Level:Notify is "Thrown" to the ErrorClass (see Throw, ThrowFile, ThrowMessage).

Implementation: The base class method (ErrorClass.TakeNotify) displays the error message and returns nothing. Note however, that the various "Throw" methods return Level:Benign (via the TakeError method) when a Level:Notify error is "Thrown."

Example:

```
  INCLUDE('ABERROR.INC')        !declare ErrorClass
MyErrorClass CLASS(ErrorClass)  !declare derived class
TakeNotify   PROCEDURE,VIRTUAL  !prototype corresponding virtual
        END
GlobalErrors MyErrorClass       !declare GlobalErrors object
 CODE
 GlobalErrors.Init              !GlobalErrors initialization
 !program code
 GlobalErrors.Throw(Msg:CreateFailed) !Throw method calls SELF.TakeNotify to
                   !automatically call the derived class method
                   !rather than the base class method
 !program code

MyErrorClass.TakeNotify PROCEDURE !derived class virtual to handle notify errors
  CODE
 !your custom code here
 RETURN
```

See Also: TakeError, Throw, ThrowFile, ThrowMessage

TakeOther (process other error)

TakeOther, PROTECTED, VIRTUAL, PROC

The **TakeOther** method is called when an error with an unrecognized severity level is "Thrown" to the ErrorClass (see Throw, ThrowFile, ThrowMessage). By default, an "other" error is treated as a program error.

TakeOther must return a severity level.

Implementation: The base class method (ErrorClass.TakeOther) calls TakeProgram.

Return Data Type: BYTE

Example:

```
  INCLUDE('ABERROR.INC')           !declare ErrorClass
MyErrorClass CLASS(ErrorClass)     !declare derived class
TakeOther    FUNCTION,BYTE,VIRTUAL !prototype corresponding virtual
       END
GlobalErrors MyErrorClass          !declare GlobalErrors object
 CODE
 GlobalErrors.Init                 !GlobalErrors initialization
 !program code
 GlobalErrors.Throw(Msg:CreateFailed) !Throw calls SELF.TakeOther to
                    !automatically call the derived class method
                    !rather than the base class method
 !program code

MyErrorClass.TakeOther FUNCTION    !derived class virtual to handle "other" errors
  CODE
 !your custom code here
 RETURN Level:Program
```

See Also: TakeError, Throw, ThrowFile, ThrowMessage

TakeProgram (process program error)

TakeProgram, PROTECTED, VIRTUAL, PROC

The **TakeProgram** method is called when an error with Level:Program is "Thrown" to the ErrorClass (see Throw, ThrowFile, ThrowMessage). By default, a program error is treated as a fatal error.

TakeProgram must return a severity level.

Implementation: The base class method (ErrorClass.TakeProgram) calls TakeFatal.

Return Data Type: BYTE

Example:

```
  INCLUDE('ABERROR.INC')            !declare ErrorClass
MyErrorClass CLASS(ErrorClass)      !declare derived class
TakeProgram   FUNCTION,BYTE,VIRTUAL !prototype corresponding virtual
       END
GlobalErrors MyErrorClass           !declare GlobalErrors object
 CODE
 GlobalErrors.Init                  !GlobalErrors initialization
 !program code
 GlobalErrors.Throw(Msg:CreateFailed) !Throw calls SELF.TakeProgram to
                    !automatically call the derived class method
                    !rather than the base class method
 !program code

MyErrorClass.TakeProgram FUNCTION   !derived class virtual to handle program errors
  CODE
 !your custom code here
 RETURN Level:Program
```

See Also: TakeError, Throw, ThrowFile, ThrowMessage

TakeUser (process user error)

TakeUser, PROTECTED, VIRTUAL, PROC

The **TakeUser** method is called when an error with Level:User is "Thrown" to the ErrorClass (see Throw, ThrowFile, ThrowMessage).

TakeUser must return a severity level to denote the user's response.

Implementation: The base class method (ErrorClass.TakeUser) displays the error message and returns either Level:Benign or Level:Cancel depending on the end user's response.

Return Data Type: BYTE

Example:

```
  INCLUDE('ABERROR.INC')          !declare ErrorClass
MyErrorClass CLASS(ErrorClass)    !declare derived class
TakeUser    FUNCTION,BYTE,VIRTUAL !prototype corresponding virtual
       END
GlobalErrors MyErrorClass         !declare GlobalErrors object
 CODE
 GlobalErrors.Init                !GlobalErrors initialization
 !program code
 GlobalErrors.Throw(Msg:CreateFailed) !Throw method calls SELF.TakeUser to
                   !automatically call the derived class method
 .                  !rather than the base class method
 !program code

MyErrorClass.TakeUser FUNCTION    !derived class virtual to handle user errors
 CODE
 !your custom code here
 IF MESSAGE(SELF.SubsString(),SELF.Errors.Title,ICON:Question, |
   Button:Yes+Button:No,BUTTON:Yes,0) = Button:Yes
  !your custom code here
  RETURN Level:Benign
 ELSE
  !your custom code here
  RETURN Level:Cancel
 END
```

See Also: TakeError, Throw, ThrowFile, ThrowMessage

Throw (process specified error)

Throw(*error id* **), PROC**

Throw	Processes the specified error then returns its severity level.
error id	An integer constant, variable, EQUATE, or expression that indicates which error to process.

The **Throw** method processes the specified error by calling other ErrorClass methods, then returns its severity level.

Typically, Throw is the method your program calls when it encounters a known error. That is, as your program encounters errors or other notable conditions, it simply calls the Throw method or one of its variations (ThrowFile or ThrowMessage), passing it the appropriate *error id*. Throw then calls any other ErrorClass methods required to handle the specified error.

Implementation: The Throw method saves the error state (ERROR, ERRORCODE, FILEERROR, and FILEERRORCODE), locates the specified error, calls the appropriate method to handle the error according to its severity level, then returns the severity level.

The ABERROR.INC file contains a list of default symbolic constants for the *error id* parameter.

Note: The Throw method may or may not RETURN to your calling program, depending on the severity of the error.

Return Data Type: BYTE

Example:

```
!user level error occurred. ask user to confirm
Severity = GlobalErrors.Throw(Msg:ConfirmCancel) !handle the error condition
IF Severity = Level:Cancel
 LocalResponse = RequestCancelled
 DO ProcedureReturn
END
```

See Also: Errors, ThrowFile, ThrowMessage

ThrowFile (set value of %File, then process error)

ThrowFile(*error id, filename* **), PROC**

ThrowFile	Sets the substitution value of %File, then processes the error.
error id	An integer constant, variable, EQUATE, or expression that indicates which error to process.
filename	A string constant, variable, EQUATE, or expression that indicates which file produced the error.

The **ThrowFile** method sets the substitution value of %File, then processes the error, and finally returns the severity level of the error.

ThrowFile combines the functionality of SetFile and Throw into a single method.

Implementation: The ABERROR.INC file contains a list of default symbolic constants for the *error id* parameter. The value of the ErrorClass.FileName property is substituted for any %File symbols in the error message text.

Note: The ThrowFile method may or may not RETURN to your calling program, depending on the severity of the error.

Return Data Type: BYTE

Example:

```
OPEN(MyFile)
IF ERRORCODE()
 Severity = GlobalErrors.ThrowFile(Msg:OpenFailed, NAME(MyFile))
END
```

See Also: FileName, SetFile, Throw

ThrowMessage (set value of %Message, then process error)

ThrowMessage(*error id, messagetext*), **PROC**

ThrowMessage

Sets the substitution value of the %Message macro, then processes the error.

error id An integer constant, variable, EQUATE, or expression that indicates which error to process.

messagetext A string constant, variable, EQUATE, or expression to replace any %Message symbols in the message text.

The **ThrowMessage** method sets the substitution value of the %Message macro, then processes the error, and finally returns the severity level of the error.

Implementation: The ABERROR.INC file contains a list of default symbolic constants for the *error id* parameter. The value of the ErrorClass.MessageText property is substituted for any %Message symbols in the error message text.

Note: The ThrowMessage method may or may not RETURN to your calling program, depending on the severity of the error.

Return Data Type: BYTE

Example:

```
OPEN(MyFile)
IF ERRORCODE()
 Severity = GlobalErrors.ThrowMessage(Msg:OpenFailed, NAME(MyFile))
END
```

See Also: MessageText, Throw

ViewHistory (initiates the view of the current errors)

ViewHistory

The **ViewHistory** method initiates the viewing of the current error History structure. This structure may contain more than one error.

ErrorLogInterface

ErrorLogInterface Concepts

The ErrorLogInterface is used to manage the update of the StdErrorFile.

Relationship to Other Application Builder Classes

The ErrorLogInterface is implemented by the StandardErrorLogClass and used as a reference by the ErrorClass and MsgBoxClass.

ErrorLogInterface Source Files

The ErrorLogInterface source code is installed by default to the Clarion \LIBSRC folder. The specific ErrorLogInterface source code and their respective components are contained in:

ABERROR.INC	ErrorLogInterface declaration
ABERROR.CLW	StandardErrorLogClass.ErrorLogInterface method definitions

ErrorLogInterface Methods

ErrorLogInterface Methods

The ErrorLogInterface defines the following methods.

Close (initiate close of log file)

Close(*force*), PROC

Close	Initiate the close of the StdErrorFile.
force	An numeric constant, variable, EQUATE, or expression that indicates whether the log file must be closed or whether it should be conditionally closed. A value of one (1 or True) unconditionally closes the errorlog file; a value of zero (0 or False) only closes the errorlog file as circumstances require.

The **Close** method closes the ErrorLog file. Level:Benign is returned from this method if no errors occur. A Level:Fatal is returned if an error occurs.

Return Data Type: BYTE

See Also: StandardErrorLogClass.Close

Open (method to initiate open of log file)

Open(*force*), PROC, PROTECTED

Open	Create and open the StdErrorFile.
force	An numeric constant, variable, EQUATE, or expression that indicates whether the log file must be opened or whether it should be conditionally opened. A value of one (1 or True) unconditionally opens the errorlog file; a value of zero (0 or False) only opens the errorlog file as circumstances require.

The **Open** method creates and opens the ErrorLog file. Level:Benign is returned from this method. A Level:Fatal is returned if an error occurs.

Return Data Type: BYTE

See Also: StandardErrorLogClass.Open

Take (update the log file)

Take(*errtext*), PROC

Take	Update the StdErrorFile.
errtext	The complete line of text to add to the log file.

The Take method updates the StdErrorFile with the complete line of text, including the error code, error message, date, and time.

Return Data Type: BYTE

FieldPairsClass

FieldPairsClass Overview

In database oriented programs there are some fundamental operations that occur over and over again. Among these repetitive operations is the saving and restoring of field values, and comparing current field values against previous values.

The ABC Library provides two classes (FieldPairsClass and BufferedPairsClass) that supply this basic buffer management. These classes are completely generic so that they may apply to any pairs of fields, regardless of the fields' origins.

Tip: The fundamental benefit of these classes is their generality; that is, they let you *move* data between pairs of structures such as FILE or QUEUE buffers, and *compare* the data, without knowing in advance what the buffer structures look like or, for that matter, without requiring that the fields even reside in conventional buffer structures.

In some ways the FieldPairsClass is similar to Clarion's deep assignment operator (:=: see the *Language Reference* for a description of this operator). However, the FieldPairsClass has the following advantages over deep assignment:

- Field pair labels need not be an exact match
- Field pairs are not limited to GROUPs, RECORDs, and QUEUEs
- Field pairs are not restricted to a single source and a single destination
- You can compare the sets of fields for equivalence
- You can mimic a data structure where no structure exists

The FieldPairsClass has the disadvantage of not handling arrays (because the FieldPairsClass relies on the ANY datatype which only accepts references to simple datatypes). See the *Language Reference* for more information on the ANY datatype.

FieldPairsClass Concepts

The FieldPairsClass lets you move data between field pairs, and lets you compare the field pairs to detect whether any changes occurred since the last operation.

This class provides methods that let you identify or "set up" the targeted field pairs.

Once the field pairs are identified, you call a single method to move all the fields in one direction (left to right), and another method to move all the fields in the other direction (right to left). You simply have to remember which entity (set of fields) you described as "left" and which entity you described as "right." A third method compares the two sets of fields and returns a value to indicate whether or not they are equivalent.

Note: The paired fields need not be contiguous in memory, nor do they need to be part of a structure. You can build a virtual structure simply by adding a series of otherwise unrelated fields to a FieldPairs object. The other FieldPairs methods then operate on this virtual structure.

FieldPairsClass Relationship to Other Application Builder Classes

The ViewManager and the BrowseClass use the FieldPairsClass and BufferedPairsClass to accomplish various tasks.

The BufferedPairsClass is derived from the FieldPairs class, so it provides all the functionality of the FieldPairsClass; however, this class also provides a third buffer area (a "save" area), plus the ability to compare the save area with the primary buffers, and the ability to restore data from the save area to the primary buffers (to implement a standard "cancel" operation).

FieldPairsClass ABC Template Implementation

Various ABC Library objects instantiate the FieldPairsClass as needed; therefore, the template generated code does not directly reference the FieldPairsClass (or BufferedPairsClass).

FieldPairsClass Source Files

The FieldPairsClass source code is installed by default in the Clarion \LIBSRC folder. The specific files and their respective components are:

ABUTIL.INC	FieldPairsClass declarations
ABUTIL.CLW	FieldPairsClass method definitions

FieldPairsClass Conceptual Example

The FieldPairs classes are very abstract, so here is a concrete example to help your understanding. The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a FieldPairsClass object.

Let's assume you have a Customer file declared as:

```
Customer FILE,DRIVER('TOPSPEED'),PRE(CUST),CREATE,BINDABLE
ByNumber  KEY(CUST:CustNo),NOCASE,OPT,PRIMARY
Record    RECORD,PRE()
CustNo     LONG
Name       STRING(30)
Phone      STRING(20)
Zip        DECIMAL(5)
          END
         END
```

And you have a Customer queue declared as:

```
CustQ   QUEUE
CustNo   LONG
Name     STRING(30)
Phone    STRING(20)
Zip      DECIMAL(5)
        END
```

And you want to move data between the file buffer and the queue buffer.

```
 INCLUDE('ABUTIL.INC')           !declare FieldPairs Class
Fields  FieldPairsClass          !declare Fields object

 CODE
 Fields.Init                                !initialize FieldPairs object
 Fields.AddPair(CUST:CustNo, CustQ.CustNo) !establish CustNo pair
 Fields.AddPair(CUST:Name,  CustQ.Name)    !establish Name pair
 Fields.AddPair(CUST:Phone, CustQ.Phone)   !establish Phone pair
 Fields.AddPair(CUST:Zip,  CustQ.Zip)      !establish Zip pair

 Fields.AssignLeftToRight   !copy from Customer FILE to CustQ QUEUE

 IF Fields.Equal()          !compare the CustQ QUEUE and Customer FILE
  MESSAGE('Buffers are equal')
 ELSE
  MESSAGE('Buffers not equal')
 END
 Fields.AssignRightToLeft   !copy from CustQ QUEUE to Customer FILE
 Fields.Kill                !terminate FieldPairs object
```

FieldPairsClass Properties

The FieldPairsClass contains the following properties.

List (recognized field pairs)

List &FieldPairsQueue

The **List** property is a reference to the structure that holds all the field pairs recognized by the FieldPairsClass object. Use the AddPair or AddItem methods to add field pairs to the List property. For each field pair, the List property includes a "Left" field and a "Right" field.

The "Left" and "Right" designations are reflected in other method names (for example, field assignments methods--AssignLeftToRight and AssignRightToLeft) so you can easily and accurately control the movement of data between the two sets of fields.

Implementation: List is a reference to a QUEUE declared in ABUTIL.INC as follows:

```
FieldPairsQueue QUEUE,TYPE
Left              ANY
Right             ANY
                  END
```

The Init method creates an empty List, and the Kill method disposes of the List. AddPair and AddItem add field pairs to the List.

See Also: AddPair, AddItem, Init

FieldPairsClass Methods

FieldPairsClass Functional Organization--Expected Use

As an aid to understanding the FieldPairsClass, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the FieldPairsClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the FieldPairsClass object
AddItem	add a field pair based on one source field
Kill	terminate the FieldPairsClass object

Mainstream Use:

AssignLeftToRight	assign each "left" field to its "right" counterpart
AssignRightToLeft	assign each "right" field to its "left" counterpart
Equal	return 1 if all pairs are equal, 0 if any pair is not equal

Occasional Use:

ClearLeft	CLEAR each "left" field
ClearRight	CLEAR each "right" field
EqualLeftRight	return 1 if all pairs are equal, 0 if any pair is not equal

Virtual Methods

Typically you will not call these methods directly. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

AddPair	add a field pair to the List property

AddItem (add a field pair from one source field)

AddItem(*left* **)**

AddItem	Adds a field pair to the List property from one source field.
left	The address of the "left" field of the pair. The field may be any data type, but may not be an array.

The **AddItem** method adds a field pair to the List property from one source field. The "right" field is supplied for you, and initially contains a copy of the data in the "left" field.

The fields need not be contiguous in memory, nor do they need to be part of a structure. Therefore you can build a virtual structure simply by adding a series of otherwise unrelated fields to a FieldPairs object. The other FieldPairs methods then operate on this virtual structure.

Implementation: AddItem assumes the List property has already been created by Init or by some other method.

By calling AddItem for a series of fields, you effectively build two virtual structures containing the fields--the "Left" is the original fields and the "Right" contains a copy of the data in the original fields at the time you call AddItem.

Example:

```
 INCLUDE('ABUTIL.INC')      !declare FieldPairs Class
DKeyPair FieldPairsClass    !declare FieldPairs reference
Org   FILE                  !declare a file
DptKey KEY(Dept,Grade)      !declare a multicomponent key
       RECORD
Dept    SHORT
Mgr     SHORT
Grade   SHORT
       END
      END
 CODE
 DKeyPair.Init               !initialize FieldPairs object
 DKeyPair.AddItem(Org:Dept)  !add Dept (left) and a copy of Dept (right)
 DKeyPair.AddItem(Org:Grade  !add Grade (left) and a copy of Grade (right)
 !some code
 DKeyPair.AssignLeftToRight  !Save the current key fields' values
 SET(Org:DptKey,Org:DptKey)  !position the file
 NEXT(Org)                   !retrieve (hopefully) a specific record
 IF ERRORCODE() OR |         !confirm retrieval of matching record by
   ~DKeyPair.Equal()         !comparing retrieved key values with saved values
  MESSAGE('Record not found!')
 END
```

See Also: Init, List

AddPair (add a field pair:FieldPairsClass)

AddPair(*left, right* **), VIRTUAL**

AddPair	Adds a field pair to the List property.
left	The label of the "left" field of the pair. The field may be any data type, but may not be an array.
right	The label of the "right" field of the pair. The field may be any data type, but may not be an array.

The **AddPair** method adds a field pair to the List property. The fields need not be contiguous in memory, nor do they need to be part of a structure. Therefore you can build a virtual structure simply by adding a series of otherwise unrelated fields to a FieldPairs object. The other FieldPairs methods then operate on this virtual structure.

Implementation: AddPair assumes the List property has already been created by Init or by some other method.

By calling AddPair for a series of fields (for example, the corresponding fields in a RECORD structure and a QUEUE structure), you effectively build two virtual structures containing the fields and a (one-to-one) relationship between the two structures.

Example:

```
 INCLUDE('ABUTIL.INC')            !declare FieldPairs Class
Fields  FieldPairsClass           !declare FieldPairs object
Customer FILE,DRIVER('TOPSPEED'),PRE(CUST)
ByNumber  KEY(CUST:CustNo),NOCASE,OPT,PRIMARY
Record    RECORD,PRE()
CustNo     LONG
Name       STRING(30)
Phone      STRING(20)
ZIP        DECIMAL(5)
          END
         END

CustQ   QUEUE
CustNo   LONG
Name     STRING(30)
Phone    STRING(20)
ZIP      DECIMAL(5)
        END
```

```
CODE
 Fields.Init                                !initialize FieldPairs object
 Fields.AddPair(CUST:CustNo, CustQ.CustNo) !establish CustNo pair
 Fields.AddPair(CUST:Name,  CustQ.Name)    !establish Name pair
 Fields.AddPair(CUST:Phone, CustQ.Phone)   !establish Phone pair
 Fields.AddPair(CUST:ZIP,  CustQ.ZIP)      !establish ZIP pair
```

See Also: Init, List

AssignLeftToRight (copy from "left" fields to "right" fields)

AssignLeftToRight

The **AssignLeftToRight** method copies the contents of each "left" field to its corresponding "right" field in the List property.

Implementation: For AddPair pairs, the "left" field is the *first* (left) parameter of the AddPair method; the "right" field is the *second* (right) parameter of the AddPair method. For AddItem pairs, the "left" field is the *only* parameter of the AddItem method. The "right" field is the FieldPairs supplied copy of the "left" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name) !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone)!establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)   !establish ZIP pair
!some code
IF ~Fields.Equal                       !compare field pairs
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToLeft             !copy changes to CUST (write) buffer
 OF BUTTON:Yes
  Fields.AssignLeftToRight             !restore original to CustQ (display) buffer
 END
END
```

See Also: AddPair, AddItem, List

AssignRightToLeft (copy from "right" fields to "left" fields)

AssignRightToLeft

The **AssignRightToLeft** method copies the contents of each "right" field to its corresponding "left" field in the List property.

Implementation: For AddPair pairs, the "left" field is the *first* (left) parameter of the AddPair method; the "right" field is the *second* (right) parameter of the AddPair method. For AddItem pairs, the "left" field is the *only* parameter of the AddItem method. The "right" field is the FieldPairs supplied copy of the "left" field.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.Equal                        !compare field pairs
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToLeft              !copy changes to CUST (write) buffer
 OF BUTTON:Yes
  Fields.AssignLeftToRight              !restore original to CustQ (display) buffer
 END
END
```

See Also: AddPair
AddItem

ClearLeft (clear each "left" field)

ClearLeft

The **ClearLeft** method clears the contents of each "left" field in the List property.

Implementation: For AddPair pairs, the "left" field is the field whose label is the *first* (left) parameter of the AddPair method; the "right" field is the field whose label is the *second* (right) parameter of the AddPair method. For AddItem pairs, the "left" field is the field whose label is the *only* parameter of the AddItem method. The "right" field is the FieldPairs supplied copy of the "left" field.

The ClearLeft method CLEARs the field. See the *Language Reference* for more information on CLEAR.

Example:

```
Fields &= NEW FieldPairsClass             !instantiate FieldPairs object
Fields.Init                               !initialize FieldPairs object
Fields.AddPair(CUST:CustNo, CustQ.CustNo) !establish CustNo pair
Fields.AddPair(CUST:Name,  CustQ.Name)    !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone)   !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)      !establish ZIP pair
!some code
IF LocalRequest = InsertRecord
 Fields.ClearRight                        !clear the CustQ fields to blank or zero
END
```

See Also: AddPair

AddItem

ClearRight (clear each "right" field)

ClearRight

The **ClearRight** method clears the contents of each "right" field in the List property.

Implementation: For AddPair pairs, the "left" field is the field whose label is the *first* (left) parameter of the AddPair method; the "right" field is the field whose label is the *second* (right) parameter of the AddPair method. For AddItem pairs, the "left" field is the field whose label is the *only* parameter of the AddItem method. The "right" field is the FieldPairs supplied copy of the "left" field.

The **ClearRight** method CLEARs the field. See the *Language Reference* for more information on CLEAR.

Example:

```
Fields &= NEW FieldPairsClass             !instantiate FieldPairs object
Fields.Init                               !initialize FieldPairs object
Fields.AddPair(CUST:CustNo, CustQ.CustNo) !establish CustNo pair
Fields.AddPair(CUST:Name,  CustQ.Name)    !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone)   !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)      !establish ZIP pair
!some code
IF LocalRequest = InsertRecord
 Fields.ClearRight                        !clear the CustQ fields to blank or zero
END
```

See Also: AddPair
AddItem

Equal (return 1 if all pairs are equal)

Equal

The **Equal** method returns one (1) if all pairs are equal and returns zero (0) if any pairs are not equal.

Implementation: The Equal method simply calls the EqualLeftRight method which does all the comparison work. Therefore, there are two different methods (Equal and EqualLeftRight) that produce exactly the same result.

This provides an alternative calling convention for the FieldPairsClass and the BufferedPairsClass. The EqualLeftRight method name is consistent with the other comparison methods in the BufferedPairsClass and is provided for that purpose. See *BufferedPairsClass Methods* for more information.

Example:

```
Fields.AddPair(CUST:Name,  CustQ.Name)  !establish Name pair
Fields.AddPair(CUST:Phone, CustQ.Phone) !establish Phone pair
Fields.AddPair(CUST:ZIP,  CustQ.ZIP)    !establish ZIP pair
!some code
IF ~Fields.Equal                        !compare field pairs
 CASE MESSAGE('Abandon Changes?',,,BUTTON:Yes+BUTTON:No)
 OF BUTTON:No
  Fields.AssignRightToLeft              !copy changes to CUST (write) buffer
 OF BUTTON:Yes
  Fields.AssignLeftToRight              !restore original to CustQ (display) buffer
 END
END
```

See Also: EqualLeftRight

EqualLeftRight (return 1 if all pairs are equal)

EqualLeftRight

The **EqualLeftRight** method returns one (1) if all pairs are equal and returns zero (0) if any pairs are not equal.

Implementation: The Equal method simply calls the EqualLeftRight method which does all the comparison work. Therefore, there are two different methods (Equal and EqualLeftRight) that produce exactly the same result.

This provides an alternative calling convention for the FieldPairsClass and the BufferedPairsClass. The EqualLeftRight method name is consistent and compatible with the other comparison methods in the BufferedPairsClass and is provided for that purpose. See *BufferedPairsClass Methods* for more information.

See Also: Equal

Init (initialize the FieldPairsClass object)

Init

The **Init** method initializes the FieldPairsClass object.

Implementation: The Init method creates the List property.

Example:

```
 INCLUDE('ABUTIL.INC')     !declare FieldPairs Class
Fields  &FieldPairsClass   !declare FieldPairs reference

 CODE
 Fields &= NEW FieldPairsClass !instantiate FieldPairs object
 Fields.Init               !initialize FieldPairs object
 .
 .
 .
 Fields.Kill               !terminate FieldPairs object
 DISPOSE(Fields)           !release memory allocated for FieldPairs object
```

See Also: Kill, List

Kill (shut down the FieldPairsClass object)

Kill

The **Kill** method disposes any memory allocated during the object's lifetime and performs any other necessary termination code.

Implementation: The Kill method disposes the List property created by the Init method.

Example:

```
 INCLUDE('ABUTIL.INC')    !declare FieldPairs Class
Fields  &FieldPairsClass  !declare FieldPairs reference

 CODE
 Fields &= NEW FieldPairsClass !instantiate FieldPairs object
 Fields.Init              !initialize FieldPairs object
 .
 .
 .
 Fields.Kill              !terminate FieldPairs object
 DISPOSE(Fields)          !release memory allocated for FieldPairs object
```

See Also: Init, List

FileDropComboClass

Overview:FileDropComboClass

The FileDropComboClass is a FileDropClass based on a COMBO control rather than a LIST control. Therefore it supports not only the selection of existing list items but also the *selection of values not in the list*, and optionally the *addition of new values to the list*. See *Control Templates--FileDropCombo* for information on the template implementation of the FileDropCombo control.

Future File DropCombo Classes

The current implementation of the FileDropComboClass is a place-holder implementation. In the future the FileDropComboClass, or its replacement, will be derived from the BrowseClass.

FileDropComboClass Concepts

Based on the end user selection, you can assign one or more values from the selected item to one or more target fields. You may display one field (e.g., a description field) but assign another field (e.g., a code field) from the selected list item.

The FileDropClass also supports filters, range limits, colors, icons, sorting, and multiple item selection (marking). See *Control Templates--FileDropCombo* for information on the template implementation of these features.

FileDropComboClass Relationship to Other Application Builder Classes

The FileDropComboClass is closely integrated with the WindowManager. These objects register their presence with each other, set each other's properties, and call each other's methods as needed to accomplish their respective tasks.

The FileDropComboClass is derived from the FileDropClass, plus it relies on several of the other Application Builder Classes to accomplish its tasks. Therefore, if your program instantiates the FileDropClass, it must also instantiate these other classes. Much of this is automatic when you INCLUDE the FileDropClass header (ABDROPS.INC) in your program's data section. See the *Conceptual Example*.

FileDropComboClass ABC Template Implementation

The ABC Templates automatically include all the classes and generate all the code necessary to support the functionality specified in your application's FileDropCombo control templates.

The templates *derive* a class from the FileDropComboClass and instantiate an object for *each* FileDropComboControl template in the application. The derived class and obect is called FDCB# where # is the FileDropCombo Control template instance number. The templates provide the derived class so you can use the FileDropComboControl template **Classes** tab to modify the FileDropCombo's behavior on an instance-by-instance basis.

The derived FileDropComboClass is local to the procedure, is specific to a single FileDropCombo and relies on the global ErrorClass object and the file-specific RelationManager and FileManager objects for the displayed lookup file.

FileDropComboClass Source Files

The FileDropComboClass source code is installed by default to the Clarion \LIBSRC folder. The FileDropComboClass source code and their respective components are contained in:

ABDROPS.INC	FileDropComboClass declarations
ABDROPS.CLW	FileDropComboClass method definitions

FileDropComboClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a FileDropComboClass object and related objects.

This example uses the FileDropComboClass object to let the end user select or enter a valid state code for a given client. The state code comes from the state file.

```
 PROGRAM
 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABDROPS.INC')
 MAP
 END

State       FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey KEY(ST:STATECODE),NOCASE,OPT
Record       RECORD,PRE()
StateCode     STRING(2)
StateName     STRING(20)
             END
            END
```

```
Customer  FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
BYNUMBER   KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
CUSTNO      LONG
Name        STRING(30)
State       STRING(2)
           END
          END

GlobalErrors  ErrorClass
VCRRequest   LONG(0),THREAD

Access:State CLASS(FileManager)
Init         PROCEDURE
             END

Relate:State CLASS(RelationManager)
Init         PROCEDURE
             END

Access:Customer CLASS(FileManager)
Init            PROCEDURE
                END



Relate:Customer CLASS(RelationManager)
Init            PROCEDURE
                END

StateQ    QUEUE
ST:STATECODE  LIKE(ST:STATECODE)
ViewPosition  STRING(512)
          END
StateView VIEW(State)
          END

CusWindow WINDOW('Add Customer'),AT(,,157,58),IMM,SYSTEM,GRAY
      PROMPT('Customer:'),AT(5,7),USE(?NamePrompt)
      ENTRY(@s20),AT(61,5,88,11),USE(CUS:NAME)
      PROMPT('State:'),AT(5,22),USE(?StatePrompt)
      LIST,AT(61,20,65,11),USE(CUS:State),FROM(StateQ),|
      FORMAT('8L~STATECODE~@s2@'),DROP(5)
      BUTTON('OK'),AT(60,39),USE(?OK),DEFAULT
      BUTTON('Cancel'),AT(104,39),USE(?Cancel)
     END
```

```
ThisWindow CLASS(WindowManager)
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END

StateDrop  CLASS(FileDropClass)
Q          &StateQ
           END

  CODE
  ThisWindow.Run()

ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
  GlobalErrors.Init
  Relate:State.Init
  Relate:Customer.Init
  SELF.Request = InsertRecord
  ReturnValue = PARENT.Init()
  IF ReturnValue THEN RETURN ReturnValue.
  SELF.FirstField = ?CUS:NAME
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  SELF.AddUpdateFile(Access:Customer)
  SELF.AddItem(?Cancel,RequestCancelled)
  SELF.OkControl = ?OK
  Relate:Customer.Open
  Relate:State.Open
  SELF.Primary &= Relate:Customer
  SELF.InsertAction = Insert:Batch
  IF SELF.PrimeUpdate() THEN RETURN Level:Notify.
  OPEN(CusWindow)
  SELF.Opened=True
 !initialize the FileDropCombo Class with:
 ! the combo's USE variable, COMBO control, view POSITION, VIEW, combo's FROM QUEUE,
 ! primary file RelationManager object, WindowManager object, ErrorClass object,
 ! add records flag, hot fields flag, case sensitive flag
StateDrop.Init(?CUS:State,StateQ.ViewPosition,|
StateView,StateQ,Relate:State,ThisWindow,GlobalErrors,1,0,0)
  StateDrop.Q &= StateQ
  StateDrop.AddSortOrder()
  StateDrop.AddField(ST:STATECODE,StateDrop.Q.ST:STATECODE)
  StateDrop.AddUpdateField(ST:STATECODE,CUS:State)
  ThisWindow.AddItem(StateDrop)
  SELF.SetAlerts()
  RETURN ReturnValue
```

```
ThisWindow.Kill PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  IF ReturnValue THEN RETURN ReturnValue.
  Relate:Customer.Close
  Relate:State.Close
  Relate:State.Kill
  Relate:Customer.Kill
  GlobalErrors.Kill
  RETURN ReturnValue

Access:State.Init PROCEDURE
  CODE
  PARENT.Init(State,GlobalErrors)
  SELF.FileNameValue = 'State'
  SELF.Buffer &= ST:Record
  SELF.LazyOpen = False
  SELF.AddKey(ST:StateCodeKey,'ST:StateCodeKey',0)

Access:Customer.Init PROCEDURE
  CODE
  PARENT.Init(Customer,GlobalErrors)
  SELF.FileNameValue = 'Customer'
  SELF.Buffer &= CUS:Record
  SELF.Create = True
  SELF.LazyOpen = False
  SELF.AddKey(CUS:BYNUMBER,'CUS:BYNUMBER',0)

Relate:State.Init PROCEDURE
  CODE
  Access:State.Init
  PARENT.Init(Access:State,1)

Relate:Customer.Init PROCEDURE
  CODE
  Access:Customer.Init
  PARENT.Init(Access:Customer,1)
```

FileDropComboClass Properties

FileDropComboClass Properties

The FileDropComboClass inherits all the properties of the FileDropClass from which it is derived. See *FileDropClass Properties* and *ViewManager Properties* for more information.

AskProcedure (update procedure)

AskProcedure USHORT

The **AskProcedure** property is used to determine which Update Procedure to call if the FileDropCombo control allows updates.

Implementation: The FileDropCombo control template allows the filedrop queue to be updated if the entry does not exist in the queue. This property identifies the procedure to call to update the queue. The template generates the code that initiates the value of this property.

See Also: FileDropComboClass.Ask

ECOn (current state of entry completion)

ECOn BYTE, PROTECTED

The **ECOn** property indicates the current state of EntryCompletion. A value of one (1 or True) indicates the current state of entry completion is on; a value of zero (0 or False) indicates it is off.

See Also: EntryCompletion

EntryCompletion (automatic fill-ahead flag)

EntryCompletion BYTE

The **EntryCompletion** property indicates whether FileDropComboClass tries to automatically complete the end user selection. A value of one (1) or True enables the automatic completion; a value of zero (0) or False disables automatic completion.

When EntryCompletion is enabled, the FileDropComboClass object displays the list item that is nearest the value entered by the end user. The FileDropComboClass object reevaluates the display immediately after each end user keystroke.

Implementation: The Init method sets the EntryCompletion property to True. The TakeEvent and TakeNewSelection methods implement the behavior specified by EntryCompletion.

See Also: Init, TakeEvent,TakeNewSelection

RemoveDuplicatesFlag (remove duplicate data)

RemoveDuplicatesFlag BYTE

The **RemoveDuplicatesFlag** property is a flag used to determine if duplicates are not allowed in the filedrop queue. A value of one (1 or True) does not allow duplicates in the filedrop queue; a value of zero (0 or False) allows duplicates into the filedrop queue.

Implementation: The RemoveDuplicatesFlag is set by the ABC templates when the FileDropCombo control template is used. The 'Remove Duplicates' checkbox controls this setting.

See Also: FileDropComboClass.Init, FileDropComboClass.AddRecord

UseField (COMBO USE variable)

UseField **ANY, PROTECTED**

The **UseField** property is a reference to the COMBO's USE variable. The FileDropComboClass uses this property to lookup the USE value in the current queue.

Implementation: The Init method initializes the UseField property.

See Also: Init

FileDropComboClass Methods

FileDropComboClass Methods

The FileDropComboClass inherits all the methods of the FileDropClass from which it is derived. See *FileDropClass Methods* and *ViewManager Methods* for more information.

FileDropComboClass Functional Organization--Expected Use

As an aid to understanding the FileDropComboClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the FileDropComboClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the FileDropComboClass object
AddField[I]	specify display fields
AddUpdateField[I]	specify field assignments
AddRange[II]	add a range limit to the active sort order
AppendOrder[II]	refine the active sort order
Kill[I]	shut down the FileDropComboClass object

Mainstream Use:

ResetQueue	refresh filedrop queue
GetQueueMatch	locate a list item
Ask[V]	add a record to the lookup file
TakeEvent[V]	process the current ACCEPT loop event
TakeNewSelection[V]	process the EVENT:Selected events

Occasional Use:

Open[II]	open the filedrop view
PrimeRecord[II]	prepare an item for adding
SetFilter[II]	specify a filter for the active sort order
ApplyFilter[II]	range limit and filter the result set
ApplyOrder[II]	sort the result set
GetFreeElementName[II]	return the free element field name
SetOrder[II]	replace the active sort order
Close[II]	close the filedrop view

[I] These methods are inherited from the FileDropClass.
[II] These methods are inherited from the ViewManager.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Ask	add a record to the lookup file
SetQueueRecord[I]	copy data from file buffer to queue buffer
Reset[II]	reset the view position
TakeEvent	process the current ACCEPT loop event
TakeNewSelection	process the EVENT:Selected events
ValidateRecord[I]	validate the current result set element

[I] These methods are inherited from the FileDropClass.
[II] These methods are inherited from the ViewManager.

AddRecord (add a record filedrop queue)

AddRecord, VIRTUAL, PROTECTED

The **AddRecord** method adds a record to the filedropcombo's queue.

Ask (add a record to the lookup file)

Ask, VIRTUAL, PROTECTED

The **Ask** method adds a new record to the filedrop's lookup file and returns a value indicating its success or failure. If it succeeds it returns Level:Benign, otherwise it returns the severity level of the last error it encountered while trying to add the record. See *Error Class* for more information on severity levels.

Implementation: The TakeEvent method calls the Ask method. Return value EQUATEs are declared in ABERROR.INC (see *Error Class* for more information):

```
Level:Benign                EQUATE(0)
Level:User                  EQUATE(1)
Level:Program               EQUATE(2)
Level:Fatal                 EQUATE(3)
Level:Cancel                EQUATE(4)
Level:Notify                EQUATE(5)
```

Return Data Type: BYTE

Example:

```
MyFileDropComboClass.TakeEvent PROCEDURE
UserStr     CSTRING(256),AUTO
  CODE
 !procedure code
 IF SELF.Ask() = Level:Benign      !update lookup file
  SELF.UpdateFields.AssignLeftToRight
  SELF.Close
  SELF.ResetQueue
  SELF.ListField{PROP:Selected} = SELF.GetQueueMatch(UserStr)
  DISPLAY(SELF.ListField)
 END
 !procedure code
```

SeeAlso:

TakeEvent

GetQueueMatch (locate a list item)

GetQueueMatch(*search value* **), PROTECTED**

GetQueueMatch Locates the *search value* within the first field of the display queue.

search value A string constant, variable, EQUATE, or expression containing the value to locate.

The **GetQueueMatch** method locates a value within the first field of the display queue and returns the position of the matching item. A return value of zero (0) indicates no matching items.

The Init method *case* parameter determines the type of search (case sensitive or insensitive) performed.

Return Data Type: LONG

Example:

```
MyFileDropComboClass.TakeEvent PROCEDURE
UserStr     CSTRING(256),AUTO
  CODE
  CASE EVENT()
  OF EVENT:Accepted
  UserStr=CLIP(SELF.UseField)
  IF SELF.GetQueueMatch(UserStr) = 0     !if entered value not in
   SELF.Reset                            ! lookup file / queue
   IF SELF.Ask()=Level:Benign            !update the lookup file
    SELF.UpdateFields.AssignLeftToRight
    SELF.Close
   SELF.ResetQueue
    SELF.ListField{PROP:Selected}=SELF.GetQueueMatch(UserStr)!position to new item
    DISPLAY(SELF.ListField)
   END
   !procedure code
```

See Also: Init

Init (initialize the FileDropComboClass object)

Init(*use, combo*, *position, view, queue, relationmgr, windowmgr, errormgr* [,*add*] [,*sync*] [,*case*] **)**

Init	Initializes the FileDropCombClass object.
use	The label of the *combo*'s USE attribute variable.
combo	A numeric constant, variable, EQUATE, or expression containing the control number of the filedrop's COMBO control.
position	The label of a string variable within the *queue* containing the POSITION of the *view*.
view	The label of the filedrop's underlying VIEW.
queue	The label of the *combo*'s data source QUEUE.
relationmgr	The label of the filedrop's primary file RelationManager object. See *Relation Manager* for more information.
windowmgr	The label of the filedrop's WindowManager object. See *Window Manager* for more information.
errormgr	The label of the filedrop's ErrorClass object. See *Error Management* for more information.
add	A numeric constant, variable, EQUATE, or expression indicating whether records may be added to the lookup file. A value of zero (0 or False) prevents adds; a value of one (1or True) allows adds. If omitted, *add* defaults to one (1).
sync	A numeric constant, variable, EQUATE, or expression indicating whether to reget the underlying data on a new selection (allows hot fields). A value of one (1 or True) regets the data (so it can be displayed in other controls besides the COMBO control); a value of zero (0 or False) does not. If omitted, *sync* defaults to one (1).
case	A numeric constant, variable, EQUATE, or expression indicating whether filedrop searches are case sensitive. A value of one (1 or True) provides case sensitive searches; a value of zero (0 or False) gives case insensitive searches. If omitted, *case* defaults to zero (0).

The **Init** method initializes the FileDropComboClass object.

Implementation: Among other things, the Init method calls the PARENT.Init (FileDropClass.Init) method. See *FileDropClass* for more information.

Example:

```
ThisWindow.Init PROCEDURE
 CODE
 !procedure code                          !init filedropcombo object
  FDBC4.Init( CLI:StateCode,              |          ! USE variable
       ?CLI:StateCode,                    |          ! COMBO control
       Queue:FileDropCombo.ViewPosition,  | ! VIEW POSITION variable
       FDCB4::View:FileDropCombo,         | ! VIEW
       Queue:FileDropCombo,               | ! QUEUE
       Relate:States,                     | ! RelationManager object
       ThisWindow,                        | ! WindowManager object
       GlobalErrors,                      | ! ErrorClass object
       1,                                 | ! allow adds
       0,                                 | ! refresh hot fields on new selection
       0)                                   ! case insensitive searches
  FDBC4.Q &= Queue:FileDropCombo
  FDBC4.AddSortOrder()
  FDBC4.AddField(ST:StateCode,FDBC4.Q.ST:StateCode)
  FDBC4.AddField(ST:State,FDBC4.Q.ST:State)
  FDBC4.AddUpdateField(ST:StateCode,CLI:StateCode)
```

See Also: FileDropClass.Init

KeyValid (check for valid keystroke)

KeyValid, VIRTUAL

The **KeyValid** method determines if a valid keystroke is in the keyboard buffer. If LeftKey (cursor left), RightKey (cursor right), ShiftLeft (Shift-cursor left), ShiftRight (Shift-cursor right) are in the buffer a False value is returned from this method. A True value is returned if any other keystroke is pressed.

ReturnDataType: BYTE

See Also:
FileDropComboClass.TakeNewSelection

Kill (shut down the FileDropComboClass object)

Kill, VIRTUAL

The **Kill** method releases any memory allocated during the life of the FileDropComboClass object and performs any other required termination code.

Implementation: Among other things, the Kill method calls the PARENT.Kill (FileDropClass.Kill) method to shut down the FileDropClass object.

ResetFromList (reset VIEW)

ResetFromList, PROTECTED

The **ResetFromList** method resets the VIEW based on the current record in the FileDropComboClass's object.

Implementation: The ResetFromList method is called by the FileDropComboClass.TakeAccepted method and the FileDropComboClass.TakeNewSelection method.

See Also:
FileDropComboClass.TakeAccepted, FileDropComboClass.TakeNewSelection

ResetQueue (refill the filedrop queue)

ResetQueue([*force*] **), VIRTUAL, PROC**

ResetQueue Refills the filedrop queue and the COMBO's USE variable.

force A numeric constant, variable, EQUATE, or expression that indicates whether to refill the queue even if the sort order did not change. A value of one (1 or True) unconditionally refills the queue; a value of zero (0 or False) only refills the queue if circumstances require it. If omitted, *force* defaults to zero.

The **ResetQueue** method refills the filedrop's display queue and the COMBO's USE variable, applying the applicable sort order, range limits, and filters, then returns a value indicating which item, if any, in the displayed lookup file already matches the *target* fields' values specified by the AddUpdateField method. A return value of zero (0) indicates no matching items; any other value indicates the position of the matching item.

For example, if the filedrop "looks up" the state code for a customer, and the current customer's state code field already contains a valid value, then the ResetQueue method positions the filedrop list to the current customer's state code value.

Implementation: The TakeEvent method calls the ResetQueue method. The ResetQueue calls the PARENT.ResetQueue method, then enables or disables the drop button depending on the presence or absence of pick list items.

Return Data Type: LONG

Example:

```
MyFileDropComboClass.TakeEvent PROCEDURE
UserStr     CSTRING(256),AUTO
  CODE
  CASE EVENT()
  OF EVENT:Accepted
  UserStr=CLIP(SELF.UseField)
  IF SELF.GetQueueMatch(UserStr) = 0       !if entered value not in
   SELF.Reset                              ! lookup file / queue
   IF SELF.Ask()=Level:Benign              !update the lookup file
    SELF.UpdateFields.AssignLeftToRight
    SELF.Close
    SELF.ResetQueue(1)                     !refill the updated queue
    SELF.ListField{PROP:Selected}=SELF.GetQueueMatch(UserStr)!position to new item
    DISPLAY(SELF.ListField)
   END
   !procedure code
```

See Also: TakeEvent, FileDropClass.ResetQueue

TakeAccepted (process accepted event)

TakeAccepted, VIRTUAL

The TakeAccepted method processes the accepted event of the entry portion of the FileDropCombo control.

TakeEvent (process the current ACCEPT loop event:FileDropComboClass)

TakeEvent, VIRTUAL

The **TakeEvent** method processes the current ACCEPT loop event for the FileDropComboClass object.

Implementation: The WindowManager.TakeEvent method calls the TakeEvent method. On a new item selection, the TakeEvent method calls the TakeNewSelection method.

On EVENT:Accepted for the entry portion of the COMBO, the TakeEvent method calls the GetQueueMatch method to locate the list item nearest to the entered value. If the entered value is not in the lookup file, the TakeEvent method calls the Ask method to add the new value to the lookup file. If the add is successful, TakeEvent calls the ResetQueue method to refill the display queue.

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
  CODE
 !procedure code
 LOOP I = 1 TO RECORDS(SELF.Browses)
  GET(SELF.Browses,I)
  SELF.Browses.Browse.TakeEvent
 END
 LOOP i=1 TO RECORDS(SELF.FileDrops)
  GET(SELF.FileDrops,i)
  ASSERT(~ERRORCODE())
  SELF.FileDrops.FileDrop.TakeEvent
 END
 RETURN RVal
```

See Also: Ask, GetQueueMatch, ResetQueue, TakeNewSelection, WindowManager.TakeEvent

TakeNewSelection (process NewSelection events:FileDropComboClass)

TakeNewSelection(*field* **), VIRTUAL**

TakeNewSelection	Processes the EVENT:NewSelection event.
field	A numeric constant, variable, EQUATE, or expression containing the control number of the control that generated the EVENT:NewSelection event.

The **TakeNewSelection** method processes the EVENT:NewSelection event for the FileDropComboClass object.

Implementation: The ResetQueue method and the TakeEvent method call the TakeNewSelection method. If the FileDropComboClass object's LIST generated the new selection event, then the TakeNewSelection method does the field assignments specified by the AddUpdateField method or clears the target fields if there is no valid selection.

Example:

```
FileDropComboClass.TakeEvent PROCEDURE

  CODE
  CASE EVENT()
  OF EVENT:NewSelection
    SELF.TakeNewSelection(FIELD())
    SELF.WindowManager.Reset
  END
```

See Also: AddUpdateField, ResetQueue, TakeEvent

UniquePosition (check queue for duplicate record by key position)

UniquePosition, Protected

The **UniquePosition** method checks the FileDropComboClass's queue for a duplciate record by checking for duplicate key values. A return value of zero (0 or False) means there was a matching value already in the queue. Any other return value indicates no match was found.

Implementation: The UniquePosition method is called by the FileDropComboClass.AddRecord method which checks for duplicate values before adding the record to the filedropcombo's queue.

Return Data Type: LONG

See Also: FileDropComboClass.AddRecord

FileDropClass

FileDropClass Overview

Future FileDropClasses

The current implementation of the FileDropClass is a place-holder implementation. In the future the FileDropClass, or its replacement, will be derived from the BrowseClass.

FileDropClass Concepts

The FileDropClass is a ViewManager that supports a file-loaded scrollable list on a window. By convention, a FileDrop provides a "pick list" for the end user. A pick list is a finite list of mutually exclusive or alternative choices--the end user may choose only one of several items, but need not memorize the choices, because all the choices are displayed.

Based on the end user selection, you can assign one or more values from the selected item to one or more target fields. You may display one field (e.g., a description field) but assign another field (e.g., a code field) from the selected list item.

The FileDropClass also supports filters, range limits, colors, icons, sorting, and multiple item selection (marking). See Control Templates--FileDrop for information on the template implementation of these features.

FileDropClass Relationship to Other Application Builder Classes

The FileDropClasss is closely integrated with the WindowManager. These objects register their presence with each other, set each other's properties, and call each other's methods as needed to accomplish their respective tasks.

The FileDropComboClass is derived from the FileDropClass, and the FileDropClass is derived from the ViewManager. The FileDropClass relies on several of the other Application Builder Classes to accomplish its tasks. Therefore, if your program instantiates the FileDropClass, it must also instantiate these other classes. Much of this is automatic when you INCLUDE the FileDropClass header (ABDROPS.INC) in your program's data section. See the *Conceptual Example*.

FileDropClass ABC Template Implementation

The ABC Templates automatically include all the classes and generate all the code necessary to support the functionality specified in your application's FileDrop control templates.

The templates *derive* a class from the FileDropClass and instantiate an object for *each* FileDropControl template in the application. The derived class and object is called FDB# where # is the FileDrop Control template instance number. The templates provide the derived class so you can use the FileDropControl template **Classes** tab to modify the FileDrop's behavior on an instance-by-instance basis.

The derived FileDropClass is local to the procedure, is specific to a single FileDropCombo and relies on the global file-specific RelationManager and FileManager objects for the displayed lookup file.

FileDropClass Source Files

The FileDropClass source code is installed by default to the Clarion \LIBSRC folder. The FileDropClass source code and their respective components are contained in:

ABDROPS.INC	FileDropClass declarations
ABDROPS.CLW	FileDropClass method definitions

FileDropClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a FileDropClass object and related objects.

This example uses the FileDropClass object to let the end user select a valid state code for a given client. The state code comes from the State file. When they are initialized properly, the FileDropClass and WindowManager objects do most of the work (event handling and field assignments) internally.

```
 PROGRAM

 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABDROPS.INC')
 MAP
 END

State        FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey KEY(ST:STATECODE),NOCASE,OPT
Record        RECORD,PRE()
StateCode      STRING(2)
```

```
StateName      STRING(20)
              END
             END

Customer  FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
BYNUMBER   KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
CUSTNO      LONG
Name        STRING(30)
State       STRING(2)
           END
          END

GlobalErrors  ErrorClass
VCRRequest   LONG(0),THREAD

Access:State  CLASS(FileManager)
Init          PROCEDURE
              END

Relate:State  CLASS(RelationManager)
Init          PROCEDURE
              END

Access:Customer CLASS(FileManager)
Init              PROCEDURE
                  END

Relate:Customer CLASS(RelationManager)
Init              PROCEDURE
                  END

StateQ       QUEUE
ST:STATECODE  LIKE(ST:STATECODE)
ViewPosition  STRING(512)
             END
StateView VIEW(State)
          END
CusWindow WINDOW('Add Customer'),AT(,,157,58),IMM,SYSTEM,GRAY
       PROMPT('Customer:'),AT(5,7),USE(?NamePrompt)
       ENTRY(@s20),AT(61,5,88,11),USE(CUS:NAME)
       PROMPT('State:'),AT(5,22),USE(?StatePrompt)
       LIST,AT(61,20,65,11),USE(CUS:State),FROM(StateQ),|
       FORMAT('8L~STATECODE~@s2@'),DROP(5)
       BUTTON('OK'),AT(60,39),USE(?OK),DEFAULT
       BUTTON('Cancel'),AT(104,39),USE(?Cancel)
      END
ThisWindow CLASS(WindowManager)
```

```
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
            END

StateDrop   CLASS(FileDropClass)
Q           &StateQ
            END
  CODE
  ThisWindow.Run()

ThisWindow.Init PROCEDURE()
ReturnValue  BYTE,AUTO
  CODE
  GlobalErrors.Init
  Relate:State.Init
  Relate:Customer.Init
  SELF.Request = InsertRecord
  ReturnValue = PARENT.Init()
  IF ReturnValue THEN RETURN ReturnValue.
  SELF.FirstField = ?CUS:NAME
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  SELF.AddUpdateFile(Access:Customer)
  SELF.AddItem(?Cancel,RequestCancelled)
  SELF.OkControl = ?OK
  Relate:Customer.Open
  Relate:State.Open
  SELF.Primary &= Relate:Customer
  SELF.InsertAction = Insert:Batch
  IF SELF.PrimeUpdate() THEN RETURN Level:Notify.
  OPEN(CusWindow)
  SELF.Opened=True
 !initialize the FileDrop Class with:
 ! the LISTS's USE variable, LIST control, view POSITION, VIEW, LISTS's FROM QUEUE,
 ! primary file RelationManager object, WindowManager object
  StateDrop.Init(?CUS:State,StateQ.ViewPosition,StateView,StateQ,Relate:State,ThisWindow)
  StateDrop.Q &= StateQ
  StateDrop.AddSortOrder()
  StateDrop.AddField(ST:STATECODE,StateDrop.Q.ST:STATECODE)
  StateDrop.AddUpdateField(ST:STATECODE,CUS:State)
  ThisWindow.AddItem(StateDrop)
  SELF.SetAlerts()
  RETURN ReturnValue
```

```
ThisWindow.Kill PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  IF ReturnValue THEN RETURN ReturnValue.
  Relate:Customer.Close
  Relate:State.Close
  Relate:State.Kill
  Relate:Customer.Kill
  GlobalErrors.Kill
  RETURN ReturnValue

Access:State.Init PROCEDURE
  CODE
  PARENT.Init(State,GlobalErrors)
  SELF.FileNameValue = 'State'
  SELF.Buffer &= ST:Record
  SELF.LazyOpen = False
  SELF.AddKey(ST:StateCodeKey,'ST:StateCodeKey',0)

Access:Customer.Init PROCEDURE
  CODE
  PARENT.Init(Customer,GlobalErrors)
  SELF.FileNameValue = 'Customer'
  SELF.Buffer &= CUS:Record
  SELF.Create = True
  SELF.LazyOpen = False
  SELF.AddKey(CUS:BYNUMBER,'CUS:BYNUMBER',0)

Relate:State.Init PROCEDURE
  CODE
  Access:State.Init
  PARENT.Init(Access:State,1)

Relate:Customer.Init PROCEDURE
  CODE
  Access:Customer.Init
  PARENT.Init(Access:Customer,1)
```

FileDropClass Properties

FileDropClass Properties

The FileDropClass inherits all the properties of the ViewManager from which it is derived. See *ViewManager Properties* for more information.

In addition to the inherited properties, the FileDropClass contains the properties listed below.

AllowReset (allow a reset)

AllowReset BYTE

The **AllowReset** property indicates that a reset of the object's data can occur.

DefaultFill (initial display value)

DefaultFill BYTE

The **DefaultFill** property indicates whether FileDropClass object's LIST displays an initial value or blank, before the end user selects a value. A value of one (1) displays an initial value; a value of zero (0) displays nothing.

Implementation: The Init method sets the DefaultFill property to one (1). The ResetQueue method implements the behavior specified by DefaultFill.

See Also: Init, ResetQueue

InitSyncPair (initial list position)

InitSyncPair BYTE

The **InitSyncPair** property controls the initial position of the droplist. A value of one (1 or True) initially positions the list closest to the value already contained in the target assignment fields. A value of zero (0 or False) positions the list to the first item in the specified sort order.

Implementation: The Init method sets the InitSyncPair property to one (1). The ResetQueue method implements the behavior specified by the InitSyncPair property.

See Also: Init, ResetQueue

FileDropClass Methods

FileDropClass Methods

The FileDropClass inherits all the methods of the ViewManager from which it is derived. See *ViewManager Methods* for more information.

FileDropClass Functional Organization--Expected Use

As an aid to understanding the FileDropClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the FileDropClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the FileDropClass object
AddField	specify display fields
AddUpdateField	specify field assignments
AddRange[I]	add a range limit to the active sort order
AppendOrder[I]	refine the active sort order
Kill	shut down the FileDropClass object

Mainstream Use:

ResetQueue	fill or refill filedrop queue
TakeEvent[V]	process the current ACCEPT loop event
TakeNewSelection[V]	processes EVENT:Selected events

Occasional Use:

Open[I]	open the filedrop view
PrimeRecord[I]	prepare an item for adding
SetFilter[I]	specify a filter for the active sort order
ApplyFilter[I]	range limit and filter the result set
ApplyOrder	sort the result set
GetFreeElementName[I]	return the free element field name
SetOrder[I]	replace the active sort order
Close[I]	close the filedrop view

[I] These methods are inherited from the ViewManager Class.

[V] These methods are also virtual.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

SetQueueRecord	copy data from file buffer to queue buffer
Reset[I]	reset the view position
TakeEvent[V]	process the current ACCEPT loop event
TakeNewSelection	processes EVENT:Selected events
ValidateRecord	validate the current result set element

[I] These methods are inherited from the ViewManager Class.

AddField (specify display fields)

AddField(*filefield, queuefield* **)**

AddField	Identifies the corresponding FILE and QUEUE fields for a filedrop list column.
filefield	The fully qualified label of the FILE field. The *filefield* is the original source of the filedrop LIST's data.
queuefield	The fully qualified label of the corresponding QUEUE field. The *queuefield* is loaded from the *filefield*, and is the immediate source of the filedrop LIST's data.

The **AddField** method identifies the corresponding FILE and QUEUE fields for a filedrop list column. You must call AddField for each column displayed in the filedrop list.

You may also use the AddField method to display memory variables by specifying a variable label as the *filefield* parameter.

Implementation: The AddField method uses the FieldPairsClass to manage the specified field pairs.

Example:

```
CODE
StFD.Init(?CLI:StCode,StateQ.Pos,StateView,StateQ,Relate:States,ThisWindow)
StFD.Q &= StateQ
StFD.AddSortOrder(StCodeKey)
StFD.AddField(STFile:StCode,StFD.Q.StCode)
StFD.AddField(STFile:StName,StFD.Q.StName)
StFD.AddUpdateField(STFile:StCode,CLI:StCode)
```

AddRecord (update filedrop queue)

AddRecord, VIRTUAL, PROTECTED

The **AddRecord** method adds data to the filedrop's display queue.

Implemenation: The ResetQueue method calls the AddRecord method to build the queue.

See Also: ResetQueue

AddUpdateField (specify field assignments)

AddUpdateField(*source, target* **)**

AddUpdateField	Identifies a *source* field and its corresponding *target* or destination field.
source	The fully qualified label of the field to copy from when the end user selects a filedrop list item.
target	The fully qualified label of the field to copy to when the end user selects a filedrop list item.

The **AddUpdateField** method identifies a *source* field and its corresponding *target* or destination field that receives the *source* field's contents when the end user selects a filedrop list item.

You may call the AddUpdateField multiple times to accomplish multiple field assignments on end user selection.

Implementation: The AddUpdateField method uses the FieldPairsClass to manage the specified field pairs.

The TakeEvent method performs the specified copy.

Example:

```
CODE
StFD.Init(?CLI:StCode,StateQ.Pos,StateView,StateQ,Relate:States,ThisWindow)
StFD.Q &= StateQ
StFD.AddSortOrder(StCodeKey)
StFD.AddField(STFile:StCode,StFD.Q.StCode)
StFD.AddField(STFile:StName,StFD.Q.StName)
StFD.AddUpdateField(STFile:StCode,CLI:StCode)
```

See Also: TakeEvent

Init (initialize the FileDropClass object)

Init(*listcontrol*, *viewposition, view, listqueue, relationmanager , window manager* **)**

Init	Initializes the FileDropClass object.
listcontrol	A numeric constant, variable, EQUATE, or expression containing the control number of the filedrop's LIST control.
viewposition	The label of a string variable within the *listqueue* containing the POSITION of the *view*.
view	The label of the filedrop's underlying VIEW.
listqueue	The label of the *listcontrol*'s data source QUEUE.
relationmanager	The label of the filedrop's primary file RelationManager object. See *Relation Manager* for more information.
windowmanager	The label of the FileDrop object's WindowManager object. See *Window Manager* for more information.

The **Init** method initializes the FileDropClass object.

Implementation: Among other things, the Init method calls the PARENT.Init (ViewManager.Init) method to initialize the view related parts of the FileDropClass object. See *View Manager* for more information.

Example:

```
CODE
StFD.Init(?CLI:StCode,StateQ.Pos,StateView,StateQ,Relate:States,ThisWindow)
StFD.Q &= StateQ
StFD.AddSortOrder(StCodeKey)
StFD.AddField(STFile:StCode,StFD.Q.StCode)
StFD.AddField(STFile:StName,StFD.Q.StName)
StFD.AddUpdateField(STFile:StCode,CLI:StCode)
```

See Also: ViewManager.Init

Kill (shut down the FileDropClass object)

Kill, VIRTUAL

The **Kill** method releases any memory allocated during the life of the FileDropClass object and performs any other required termination code.

Implementation: Among other things, the Kill method calls the PARENT.Kill (ViewManager.Kill) method to shut down the initialize the view related parts of the FileDropClass object. See *View Manager* for more information.

Example:

```
CODE
StFD.Init(?CLI:StCode,StateQ.Pos,StateView,StateQ,Relate:States,ThisWindow)
StFD.Q &= StateQ
StFD.AddSortOrder(StCodeKey)
StFD.AddField(STFile:StCode,StFD.Q.StCode)
StFD.AddField(STFile:StName,StFD.Q.StName)
StFD.AddUpdateField(STFile:StCode,CLI:StCode)
!procedure code
StFD.Kill
```

See Also: ViewManager.Kill

ResetQueue (fill filedrop queue)

ResetQueue([*force*] **), VIRTUAL, PROC**

ResetQueue Fills or refills the filedrop's display queue.

force A numeric constant, variable, EQUATE, or expression that indicates whether to refill the queue even if the sort order did not change. A value of one (1 or True) unconditionally refills the queue; a value of zero (0 or False) only refills the queue if circumstances require it. If omitted, *force* defaults to zero.

The **ResetQueue** method fills or refills the filedrop's display queue, applying the applicable sort order, range limits, and filters, then returns a value indicating which item, if any, in the displayed lookup file already matches the value of the *target* fields (specified by the AddUpdateField method). A return value of zero (0) indicates no matching items; any other value indicates the position of the matching item.

For example, if the filedrop "looks up" the state code for a customer, and the current customer's state code field already contains a valid value, then the ResetQueue method conditionally (based on the InitSyncPair property) positions the filedrop list to the current customer's state code value.

Return Data Type: LONG

Example:

```
ACCEPT
   IF EVENT() = EVENT:OpenWindow
     StateFileDrop.ResetQueue
   END
 !program code
END
```

See Also: InitSyncPair

SetQueueRecord (copy data from file buffer to queue buffer:FileDropClass)

SetQueueRecord, VIRTUAL

The **SetQueueRecord** method copies corresponding data from the *filefield* fields to the *queuefield* fields specified by the AddField method. Typically these are the file buffer fields and the filedrop list's queue buffer fields so that the queue buffer matches the file buffers.

Implementation: The ResetQueue method calls the SetQueueRecord method.

Example:

```
MyFileDropClass.SetQueueRecord PROCEDURE
  CODE
  SELF.ViewPosition=POSITION(SELF.View)
  SELF.DisplayFields.AssignLeftToRight
 !Custom code here
```

See Also: ResetQueue

TakeAccepted (a virtual to accept data)

TakeAccepted, VIRTUAL

The **TakeAccepeted** method is a virtual placeholder to accept data in a FileDropCombo control.

Implementation: The TakeAccepted method is a placeholder for the derived FileDropComboClass. The FileDropClass.TakeEvent calls the TakeAccepted method.

See Also: FileDropClass.TakeEvent, FileDropComboClass.TakeAccepted

TakeEvent (process the current ACCEPT loop event--FileDropClass)

TakeEvent, VIRTUAL

The **TakeEvent** method processes the current ACCEPT loop event for the FileDropClass object.

Implementation: The WindowManager.TakeEvent method calls the TakeEvent method. The TakeEvent method calls the TakeNewSelection method.

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
  CODE
 !procedure code
 LOOP I = 1 TO RECORDS(SELF.Browses)
  GET(SELF.Browses,I)
  SELF.Browses.Browse.TakeEvent
 END
 LOOP i=1 TO RECORDS(SELF.FileDrops)
  GET(SELF.FileDrops,i)
  ASSERT(~ERRORCODE())
  SELF.FileDrops.FileDrop.TakeEvent
 END
 RETURN RVal
```

See Also: TakeNewSelection, WindowManager.TakeEvent

TakeNewSelection (process EVENT:NewSelection events:FileDropClass)

TakeNewSelection(*field* **), VIRTUAL**

TakeNewSelection Processes the EVENT:NewSelection event.

field A numeric constant, variable, EQUATE, or expression containing the control number of the control that generated the EVENT:NewSelection event.

The **TakeNewSelection** method processes the EVENT:NewSelection event for the FileDropClass object.

Implementation: The ResetQueue method and the TakeEvent method call the TakeNewSelection method. If the FileDropClass object's LIST generated the new selection event, then the TakeNewSelection method does the field assignments specified by the AddUpdateField method or clears the target fields if there is no valid selection.

Example:

```
FileDropClass.TakeEvent PROCEDURE

  CODE
  CASE EVENT()
  OF EVENT:NewSelection
    SELF.TakeNewSelection(FIELD())
  END
```

See Also: AddUpdateField, ResetQueue, TakeEvent

ValidateRecord (a virtual to validate records)

ValidateRecord, VIRTUAL

The **ValidateRecord** method is a virtual called when the FileDropClass object fills its display QUEUE. ValidateRecord returns a value indicating whether to include the current record in the displayed list. Thus ValidateRecord provides a filtering mechanism in addition to the ViewManager.SetFilter method. Valid return values include:

Record:OK	includes the record
Record:OutOfRange	excludes the record
Record:Filtered	excludes the record

Implementation: The ResetQueue method calls the ValidateRecord method. The ValidateRecord method calls the PARENT.ValidateRecord method (ViewManager.ValidateRecord).

Return value EQUATEs are declared in \LIBSRC\TPLEQU.CLW:

```
Record:OK          EQUATE(0)  !Record passes range and filter
Record:OutOfRange  EQUATE(1)  !Record fails range test
Record:Filtered    EQUATE(2)  !Record fails filter tests
```

Return Data Type: BYTE

Example:

```
MyFileDropClass.ResetQueue PROCEDURE
i LONG
  CODE
  SETCURSOR(CURSOR:Wait)
  FREE(SELF.ListQueue)
  SELF.ApplyRange
  SELF.Reset
  LOOP UNTIL SELF.Next()
    IF SELF.ValidateRecord()=Record:OK      !Validate Records
      SELF.SetQueueRecord
      ADD(SELF.ListQueue)
      ASSERT(~ERRORCODE())
      IF SELF.UpdateFields.Equal()
        i=RECORDS(SELF.ListQueue)
      END
    END
  END
 !procedure code
```

See Also: ResetQueue, ViewManager.SetFilter, ViewManager.ValidateRecord

FileManager

FileManager Overview

The FileManager class declares a file manager that consistently and flexibly handles all the routine database operations for a given file. The file manager provides "setup" methods that let you describe the file and it's keys, as well as other methods to open, read, write, and close the file.

The file manager automatically handles autoincrementing keys, and, as implemented by the ABC Templates, handles some of the validity checks specified in the Clarion data dictionary, and some of the file handling settings specified in the data dictionary or application generator. However, even if you don't use the data dictionary, the application generator, or if you don't specify validity checks in your dictionary, the file manager can still competently and efficiently handle routine database operations for your files.

Note: The FileManager class handles individual files; it does not handle referential integrity (RI) between related files. The RelationManager class enforces RI between related files.

Dual Approach to Database Operations

The FileManager methods that do standard database operations come in two versions--the plain (or interactive) version and the "Try" (or silent) version.

Interactive Database Operations

When any of these methods are called (Open, Fetch, Next, Previous, Insert, and Update), they may take several approaches and several attempts to complete the requested operation--including issuing error messages where appropriate. They may solicit information from the end user in order to proceed with the requested task. They may even terminate the application under sufficient provocation. This means the programmer can rely on the fact that if the method returned, it worked.

Silent Database Operations

When any of these methods are prepended with "Try" (TryOpen, TryFetch, TryNext, TryPrevious, TryInsert, and TryUpdate), the method makes a single attempt to complete the requested operation, then returns a success or failure indicator to the calling procedure for it to handle accordingly.

FileManager Relationship to Other Application Builder Classes

The FileManager relies on the ErrorClass for most of its error handling. Therefore, if your program instantiates the FileManager it must also instantiate the ErrorClass. See *Error Class* for more information.

Perhaps more significantly, the FileManager serves as the foundation or "errand boy" of the RelationManager. If your program instantiates the RelationManager it must also instantiate the FileManager. See *Relation Manager Class* for more information.

FileManager and Threaded Files

FileManager objects are designed to support multiple execution threads in a way that Clarion developers will recognize. That is, several MDI procedures may access the same file at the same time, with each procedure maintaining its own file buffer and file positioning information, so there is no conflict or confusion between the procedures.

To accomplish this desirable state of independence among several MDI procedures, you only need to add the THREAD attribute to your file declaration (see the *Language Reference* for more information), then instantiate a single global FileManager object for each file. This global object automatically handles multiple execution threads, so you can use it within each procedure that accesses the file. The ABC Templates generate exactly this type of code for files with the THREAD attribute.

When you want to access a file with a single shared buffer from multiple execution threads, you simply omit the THREAD attribute from the file declaration and, again, instantiate a global file-specific FileManager object within the program. This lets all your program's procedures access the file with a single shared record buffer and a single set of positioning information.

FileManager ABC Template Implementation

There are several important points to note regarding the ABC Template implementation of the FileManager class.

First, the ABC Templates *derive* a class from the FileManager class for *each* file the application processes. The derived classes are called Hide:Access:*filename*, but may be referenced as Access:*filename*. These derived classes and their methods are declared in the generated *appna*BC0.CLW through *appna*BC9.CLW files (depending on how many files your application uses). The derived class methods are specific to the file being managed, and they implement many of the file properties specified in the data dictionary such as access modes, keys, field validation and initialization, etc.

Second, the ABC Templates generate housekeeping procedures to initialize and shut down the FileManager objects. The procedures are DctInit and DctKill. These are generated into the *appna*BC.CLW file.

Third, the derived FileManager classes are configurable with the **Global Properties** dialog. See *Template Overview--File Control Options* and *Classes Options* for more information.

Finally, the ABC Templates also derive a RelationManager for each file. These objects are called Hide:Relate:*filename*, but may be referenced as Relate:*filename*. The template generated code seldom calls the derived FileManager methods directly. Instead, it calls a RelationManager method that echoes the command to the appropriate (related files') FileManager methods. See *Relation Manager* for more information on the RelationManager class.

FileManager Source Files

The FileManager source code is installed by default to the Clarion \LIBSRC folder. The specific FileManager source code and their respective components are contained in:

ABFILE.INC	FileManager declarations
ABFILE.CLW	FileManager method definitions

FileManager Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a FileManager object.

This example uses the FileManager to insert a valid record with an auto-incrementing key.

```
 PROGRAM

 INCLUDE('ABFILE.INC')             !declare FileManager class
 MAP                               !program map
 END

GlobalErrors ErrorClass                          !declare GlobalErrors object
Access:Client CLASS(FileManager)                 !derive Access:Client object
Init           PROCEDURE                         !initialize Access:File object
PrimeRecord    PROCEDURE,BYTE,PROC,VIRTUAL       !prime new record (autoinc)
ValidateField  PROCEDURE(UNSIGNED Id),BYTE,VIRTUAL   !validate a field
ValidateRecord PROCEDURE(<*UNSIGNED Id>),BYTE,VIRTUAL !validate all fields
               END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
NameKey    KEY(CLI:Name),DUP,NOCASE
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END
```

```
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
        PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
        ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
        PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
        ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
        BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
       END

 CODE
 GlobalErrors.Init                  !initialize GlobalErrors object
 Access:Client.Init                 !initial Access:Client object
 Access:Client.Open                 !open the Client file

 IF Access:Client.PrimeRecord()     !prime Client record (autoinc)
  POST(Event:CloseWindow)           !if prime fails, close down
 END

 OPEN(InsertWindow)

ACCEPT
  CASE FIELD()
  OF ?OK
   IF EVENT() = Event:Accepted                !on OK button
    IF Access:Client.Insert() = Level:Benign  !add the new Client record
     POST(Event:CloseWindow)                  !if add succeeds, close down
    ELSE                                      !if add fails
     SELECT(?CLI:Name:Prompt)                 !select client name field
     CYCLE                                    !and start over
    END
   END
  OF ?CLI:StateCode                           !on StateCode field
   IF EVENT() = EVENT:Accepted
    IF Access:Client.ValidateField(3)         !validate the StateCode (3rd) field
     SELECT(?CLI:StateCode)                   !if invalid, select StateCode field
     CYCLE                                    !and start over
    END
   END
  END
 END
 Access:Client.Close                          !close the Client file
 Access:Client.Kill                           !shut down the Access:Client object
 GlobalErrors.Kill                            !shut down the GlobalErrors object
 RETURN

Access:Client.Init  PROCEDURE
 CODE
 PARENT.Init(Client, GlobalErrors)            !call the base class Init method
 SELF.FileNameValue = 'Client'                !set the file name
```

```
 SELF.Buffer &= CLI:Record                    !point Access:Client to Client buffer
 SELF.AddKey(CLI:IDKey,'Client ID',1)         !describe the primary autoinc key
 SELF.AddKey(CLI:NameKey,'Client Name')       !describe another key

Access:Client.PrimeRecord PROCEDURE           !called by base class Insert method
Result BYTE,AUTO
 CODE
 Result = PARENT.PrimeRecord()                !call base class PrimeRecord method
 CLI:StateCode = 'FL'                         !default statecode to Florida
 RETURN Result

Access:Client.ValidateField PROCEDURE(UNSIGNED Id)!called by base class ValidateFields
 CODE                                            !and by this program too
 IF ID = 3                                       !validate the statecode (3rd) field
  GlobalErrors.SetField('StateCode')             !set field in case of error
  IF ~CLI:StateCode                              !if statecode is blank
   RETURN SELF.Throw(Msg:FieldNotInList)         !pass error to error handler
  END
 END
RETURN Level:Benign


Access:Client.ValidateRecord PROCEDURE(<*UNSIGNED F>)!called by base class
Insert
 CODE
 RETURN SELF.ValidateFields(1,3,F)          !validate all 3 fields
```

FileManager Properties

The FileManager properties include references to the specific file being managed, as well as several flags or switches that tell the FileManager how to manage the referenced file.

The references are to the file, the file name, and the file's record buffer. These references allow the otherwise generic FileManager object to process a specific file.

The processing switches include file access (sharing) mode, a create/nocreate switch, a held records mode, and a LOCK wait time parameter.

Each of these properties is fully described below.

AliasedFile (the primary file)

AliasedFile &FileManager

The **AliasedFile** property is a reference to the actual file's FileManager. A nonnull value for this property indicates the managed file is an alias of another file. The FileManager uses this property to synchronize commands, buffers, etc. between the alias file and its actual file.

Tip: This property should be null (uninitialized) for the actual file and initialized for any aliases.

Implementation: If the managed file is an alias, you should initialize the AliasedFile property after the Init method is called, or within a derived Init method specific to the managed file. See the *Conceptual Example*. The ABC Templates generate code to set this property for alias files in the *appna*BC0.CLW file.

Buffer (the record buffer)

Buffer &GROUP, PROTECTED

The **Buffer** property is a reference to the record buffer of the managed file. You can use the property to access the buffer for the file from within a generically derived class.

Implementation: The SaveBuffer method stores a copy of the current Buffer contents into the Buffers property for subsequent retrieval by the RestoreBuffer method.

You should initialize the Buffer property after the Init method is called, or within a derived Init method specific to the managed file. See the *Conceptual Example*.

See Also: Buffers, RestoreBuffer, SaveBuffer

Buffers (saved record buffers)

Buffers &BufferQueue, PROTECTED

The **Buffers** property contains saved copies of the record buffer for the managed file. The saved record images may be used to detect changes by other workstations, to implement cancel operations, etc.

Implementation: The SaveBuffer method stores a copy of the current Buffer contents into the Buffers property and returns an ID which may subsequently be used by the RestoreBuffer method to retrieve the buffer contents.

The RestoreBuffer method releases memory allocated by the SaveBuffer method. Therefore, to prevent a memory leak, each call to SaveBuffer should be paired with a corresponding call to RestoreBuffer.

Buffers is a reference to a QUEUE declared in ABFILE.INC as follows:

```
BufferQueue  QUEUE,TYPE      !Saved records
Id            LONG           !Handle to recognize saved instance
Buffer        &STRING        !Reference to a saved record
             END
```

See Also: Buffer, RestoreBuffer, SaveBuffer

Create (create file switch)

Create BYTE

The **Create** property contains a value that tells the file manager whether or not to create the file if no file exists.

A value of one (1) creates the file; a value of zero (0) does not create the file.

Implementation: The Init method sets the Create property to a value of one (1), which invokes automatic file creation. The ABC Templates override this default with the appropriate setting from the data dictionary or application generator. See *Template Overview--File Handling* for more information.

The Open method creates the file when an attempt to open the file fails because there is no file.

See Also: Init, Open

Errors (the ErrorManager)

Error &ErrorClass, PROTECTED

The **Error** property is a reference to the ErrorManager. The Error property simply identifies the ErrorManager for the various FileManager methods.

Implementation: The Init method sets the value of the Error property.

See Also: Init

File (the managed file)

File &FILE

The **File** property is a reference to the managed file. The File property simply identifies the managed file for the various FileManager methods.

Implementation: The Init method sets the value of the File property.

See Also: Init

FileName (variable filename)

FileName ANY, PROTECTED

The **FileName** property is a reference to the variable specified by the managed file's NAME attribute. The FileName property determines which DOS/Windows file is accessed by the FileManager object. The FileName property may also be used for error messages and other display purposes.

The SetName method sets the contents of the filename variable. The GetName method returns the filename.

Implementation: You must initialize either the FileName property or the FileNameValue property (but not both) after the Init method is called, or within a derived Init method specific to the managed file. See the *Conceptual Example*.

Example:

```
Access:Client CLASS(FileManager)     !derive Access:Client object
Init          PROCEDURE              !prototype Access:Client init
              END
ClientFileName STRING('Client01.tps')!variable for filename

Client FILE,DRIVER('TOPSPEED'),NAME(ClientFileName) !file with variable name
Record  RECORD,PRE()
ID       LONG
Name     STRING(20)
        END
       END
 CODE
 GlobalErrors.Init
 Access:Client.Init
 !program code

Access:Client.Init  PROCEDURE             !initialize Access:Client object
 CODE
 PARENT.Init(GlobalErrors)                !call the base class Init method
 SELF.File     &= Client                  !set File property
 SELF.FileName &= ClientFileName          !set variable filename
```

See Also: FileNameValue, GetName, SetName

FileNameValue (constant filename)

FileNameValue STRING(File:MaxFilePath), PROTECTED

The **FileNameValue** property contains the constant value specified by the managed file's NAME attribute. The FileNameValue property supplies the managed file's DOS filename for error messages or other display purposes.

The GetName method returns the DOS file name.

Implementation: You must initialize either the FileNameValue property or the FileName property (but not both) after the Init method is called, or within a derived Init method specific to the managed file. See the *Conceptual Example*.

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')     !declare FileManager class
 MAP                       !program map
 END

GlobalErrors ErrorClass          !declare GlobalErrors object
Access:Client CLASS(FileManager) !derive Access:Client object
Init      PROCEDURE              !prototype Access:Client init
        END

Client    FILE,DRIVER('TOPSPEED'),NAME('Client.TPS')!constant filename
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
           END
          END
 CODE
 GlobalErrors.Init
 Access:Client.Init
 !program code

Access:Client.Init  PROCEDURE     !initialize Access:Client object
 CODE
 PARENT.Init(GlobalErrors)        !call the base class Init method
 SELF.File      &= Client         !point Access:Client to Client file
 SELF.FileNameValue = 'Client.TPS'!set constant DOS filename
```

See Also: FileName, GetName, SetName

LazyOpen (delay file open until access)

LazyOpen BYTE

The **LazyOpen** property indicates whether to open the managed file immediately when a related file is opened, or to delay opening the file until it is actually accessed. A value of one (1 or True) delays the opening; a value of zero (0 or False) immediately opens the file.

Delaying the open can improve performance when accessing only one of a series of related files.

Implementation: The Init method sets the LazyOpen property to True. The ABC Templates override this default if instructed. See Template Overview--File Handling for more information.

The various file access methods (Open, TryOpen, Fetch, TryFetch, Next, TryNext, Insert, TryInsert, etc.) use the UseFile method to implement the action specified by the LazyOpen property

See Also: Init, Open, TryOpen, Fetch, TryFetch, Next, TryNext, Insert, TryInsert, UseFile

LockRecover (/RECOVER wait time parameter)

LockRecover SHORT

The **LockRecover** property contains the wait time parameter for the /RECOVER driver string used by the Clarion database driver. See *Database Drivers--Clarion* for more information on the /RECOVER driver string.

Implementation: The Init method sets the LockRecover property to a value of ten (10) seconds. The ABC Templates override this default with the appropriate value from the application generator. See *Template Overview--File Handling* for more information.

The Open method implements the recovery when an attempt to open the file fails because the file is LOCKed. See the *Language Reference* for more information on LOCK.

See Also: Init, Open

OpenMode (file access/sharing mode)

OpenMode BYTE

The **OpenMode** property contains a value that determines the level of access granted to both the user opening the file and other users in a multi-user system.

Implementation: The Init method sets the OpenMode property to a hexadecimal value of 42h (ReadWrite/DenyNone). The ABC Templates override this default with the appropriate value from the application generator. See *Template Overview--File Handling* for more information.

The Open method uses the OpenMode property when it OPENs the file for processing. See the *Language Reference* for more information on OPEN and access modes.

See Also: Init, Open

SkipHeldRecords (HELD record switch)

SkipHeldRecords BYTE

The **SkipHeldRecords** property contains a value that tells the file manager how to react when it encounters held records. See the *Language Reference* for more information on HOLD.

A value of one (1) skips or omits the held record and continues processing; a value of zero (0) aborts the current operation.

Implementation: The Init method sets the SkipHeldRecords property to a value of zero (0).

The Next, TryNext, Previous, and TryPrevious methods implement the action specified by the SkipHeldRecords property when an attempt to read a record fails because the record is held.

See Also: Init, Next, Previous, TryNext, TryPrevious

FileManager Methods

Naming Conventions and Dual Approach to Database Operations

As you study the functional organization of the FileManager methods, please keep this in mind: most of the common database operations (Open, Next, Previous, Fetch, Insert, and Update) come in two versions. The versions are easily identifiable based on their naming conventions:

Operation	Do *Operation* and handle any errors (automatic)
TryOperation	Do *Operation* but do not handle errors (manual)

Interactive Database Operations

When any of these methods are called (Open, Fetch, Next, Previous, Insert, and Update), they may take several approaches and several attempts to complete the requested operation, including issuing error messages where appropriate. These methods provide automatic error handling. They may solicit information from the end user in order to proceed with the requested task. They may even terminate the application under sufficient provocation. This means the programmer can rely on the fact that if the method returned, it worked.

Silent Database Operations

When any of these methods prepend "Try" (TryOpen, TryFetch, TryNext, TryPrevious, TryInsert, and TryUpdate), the method makes a single attempt to complete the requested operation, then returns a success or failure indicator to the calling procedure for it to handle accordingly. These methods require manual error handling.

FileManager Functional Organization--Expected Use

As an aid to understanding the FileManager class, it is useful to organize the various FileManager methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the FileManager methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the FileManager object
Kill	terminate the FileManager object

Mainstream Use:

Open[v]	open the file
TryOpen	open the file
Next	get the next record in sequence
TryNext	get the next record in sequence
Previous	get the previous record in sequence
TryPrevious	get the previous record in sequence
Fetch	get a specific record by key value
TryFetch	get a specific record by key value
Position	return the unique position of the current record
TryReget	get a specific record by unique position
PrimeAutoInc[v]	prepare an autoincremented record for adding
Insert	add a new record
TryInsert	add a new record
CancelAutoInc[v]	restore file to its pre-PrimeAutoInc state
Update	change the current record
TryUpdate	change the current record
Close[v]	close the file

[v] These methods are also Virtual.

Occasional Use:

ClearKey	clear a range of key component fields
SetKey	make a specific key current for other methods
KeyToOrder	return ORDER expression equal to specified key
GetComponents	return the number of components of a key
GetField	return a reference to a key component
GetFieldName	return the field name of a key component
GetEOF	return current end of file status
GetError	return the current error ID
SetError	save the current error state

GetName	return the name of the file
SetName	set the file name
SaveBuffer	save the current record buffer contents
RestoreBuffer	restore previously saved buffer contents
SaveFile	save the current file state
RestoreFile	restore a previously saved file state
UseFile	open a LazyOpen file
AddKey	describe the soft KEYs

Virtual Methods

Typically, with the possible exception of Open and Close, you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Open	open the file
BindFields	BIND all the file's fields
PrimeAutoInc	prepare an autoincremented record for adding
TryPrimeAutoInc	prepare an autoincremented record for adding
CancelAutoInc	restore file to its pre-PrimeAutoInc state
EqualBuffer	detect record buffer changes
PrimeFields	prepare record fields for adding
PrimeRecord	prepare a record for adding
Throw	process an error
ThrowMessage	set custom message text then process an error
ValidateField	validate a specific field in the current buffer
ValidateFields	validate a range of fields in the current buffer
ValidateRecord	validate all fields in the current buffer
Close	close the file

AddField(track fields in a structure)

AddField(*field tag***,** *field***,** *field type***,[***field picture***]), PROC**

AddField	Updates internal queue to track fields in a structure.
field tag	A variable length string that represents the actual field name.
field	The field represents the field name used in a queue structure.
field type	A variable length string that represents the field type.
field picture	A variable length string that represents the field picture.

The **AddField** method updates an internal queue which keeps track of the relationship of fields in a file structure to their equivalent field in a queue structure. An internal queue tracks the field name, structure field name and field type.

Implementation: The AddField method returns Level:Benign if no error occurs when the field information is added to the internal tracking queue, otherwise Level:Notify is returned.

Return Data Type: BYTE

AddKey (set the file's keys)

AddKey (*key, description* [,*autoincrement*] **)**

AddKey	Describes a KEY or static INDEX of the managed file.
key	The label of the KEY or static INDEX.
description	A string constant, variable, EQUATE, or expression describing the key.
autoincrement	An integer constant, variable, EQUATE, or expression that indicates whether the FileManager automatically generates incrementing numeric values for the key when inserting new records. A value of one (1 or True) automatically increments the key; a value of zero (0 or False) does not increment the key. If omitted, *autoincrement* defaults to zero.

The **AddKey** method describes a KEY or static INDEX of the managed file so that other FileManager methods can process it. You should typically call AddKey after the Init method is called (or within your derived Init method).

Implementation: The *description* appears at runtime on certain key related error messages.

Example:

```
Access:Client.Init  PROCEDURE
CODE
PARENT.Init(Client, GlobalErrors)      !call the base class Init method
SELF.FileNameValue = 'Client'          !set the file name
SELF.Buffer &= CLI:Record              !point Access:Client to Client buffer
SELF.AddKey(CLI:IDKey,'Client ID',1)   !describe the primary key
SELF.AddKey(CLI:NameKey,'Client Name') !describe another key
```

See Also: Init

BindFields (bind fields when file is opened)

BindFields, VIRTUAL

The **BindFields** method BINDs the fields when the file is opened. See the *Language Reference* for more information on BIND.

Implementation: The Open method calls the BindFields method.

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')            !declare FileManager class
 MAP                              !program map
 END

GlobalErrors ErrorClass           !declare GlobalErrors object
Access:Client CLASS(FileManager)  !derive Access:Client object
BindFields   PROCEDURE,VIRTUAL    !prep fields for dynamic use
        END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END
 CODE
 !program code

Access:Client.BindFields PROCEDURE !called by the base class Open method
 CODE
 BIND(CLI:RECORD)                  !bind all fields for dynamic use
```

See Also: Open

CancelAutoInc (undo PrimeAutoInc)

CancelAutoInc([*relation manager*] **), VIRTUAL, PROC**

CancelAutoInc Undoes any PrimeAutoInc action.

relation manager
The label of the managed file's RelationManager object. If present, the "undo" action cascades to any related files. If omitted, the "undo" action does not cascade to related files.

The **CancelAutoInc** method restores the managed file, and optionally any related files, to their pre-PrimeAutoInc state, typically when an insert operation is cancelled. CancelAutoInc returns a value indicating its success or failure. A return value of zero (0 or Level:Benign) indicates success; any other return value indicates a problem.

Implementation: The PrimeAutoInc method adds a "dummy" record when inserting records with autoincrementing keys. CancelAutoInc deletes this "dummy" record, and, if the *relation manager* parameter is present, CancelAutoInc deletes any children of the "dummy" record as well.

If CancelAutoInc succeeds, it returns Level:Benign (declared in ABERROR.INC). If it ultimately fails, it returns the severity level of the error it encountered while trying to restore the files. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP                                !program map
 END

GlobalErrors ErrorClass             !declare GlobalErrors object
Access:Client CLASS(FileManager)    !derive Access:Client object
Init      PROCEDURE                 !prototype Access:File init
CancelAutoInc  PROCEDURE,VIRTUAL    !prototype CancelAutoInc
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
```

```
          END
         END
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
              PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
              ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
              PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
              ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
              BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
              BUTTON('Cancel'),AT(82,53,45,14),USE(?Cancel)
             END

 CODE
 GlobalErrors.Init                !initialize GlobalErrors object
 Access:Client.Init               !initialize Access:Client object
 Access:Client.Open               !open the Client file
 IF Access:Client.PrimeRecord()   !prime Client record (autoinc)
  POST(Event:CloseWindow)         !if prime fails, close down
 END

 OPEN(InsertWindow)

 ACCEPT
  CASE FIELD()
  OF ?OK
   IF EVENT() = Event:Accepted    !on OK button
    IF Access:Client.Insert() = Level:Benign!finish adding the new Client record
     POST(Event:CloseWindow)      !if add succeeds, close down
    ELSE                          !if add fails
     SELECT(?CLI:Name:Prompt)     !select client name field
     CYCLE                        !and start over
    END
   END
  OF ?Cancel
   IF EVENT() = EVENT:Accepted    !on Cancel button
    Access:Client.CancelAutoInc   !restore Client to pre-PrimeRecord
    POST(Event:CloseWindow)       !close down
   END
  EMD
 END
```

```
 Access:Client.Close              !close the Client file
 Access:Client.Kill               !shut down the Access:Client object
 GlobalErrors.Kill                !shut down the GlobalErrors object
 RETURN

Access:Client.CancelAutoInc PROCEDURE     !restore file to pre-PrimeAutoInc
 CODE
 !your custom code here
 PARENT.CancelAutoInc             !call the base class method
 !your custom code here
```

See Also: PrimeAutoInc

ClearKey (clear specified key components)

ClearKey (*key* [, *firstcomponent*] [, *lastcomponent*] [, *highvalue*] **)**

ClearKey	Clears or (re)initializes the specified range of key component fields.
key	The label of the KEY.
firstcomponent	A numeric constant, variable, EQUATE, or expression that indicates the first component to clear. If omitted, *firstcomponent* defaults to one (1).
lastcomponent	A numeric constant, variable, EQUATE, or expression that indicates the last component to clear. If omitted, *lastcomponent* defaults to twenty-two (22).
highvalue	An integer constant, variable, EQUATE, or expression that indicates whether to clear the components to zero (or spaces for string fields) or to their highest possible values. A value of one (1) applies the highest possible value; a value of zero (0) applies spaces for strings and zeros for numerics. If omitted, *highvalue* defaults to zero (0).

The **ClearKey** method clears or (re)initializes the specified range of key component fields.

Implementation: ClearKey is useful for range limiting to the first instance of the first "free" key component. By retaining higher order key component values and clearing lower order key component values, you can fetch the first (or last) record that matches the retained higher order component values; for example, the first order (lower order key component) for a customer (higher order key component).

The value ClearKey assigns depends on three things: the data type of the component field (numeric or string), the sort direction of the component (ascending or descending), and the value of the *highvalue* parameter (True or False). The following table shows the values ClearKey assigns for each combination of data type, sort direction, and *highvalue*.

	Numeric Fields		String Fields	
highvalue	**Ascending**	**Descending**	**Ascending**	**Descending**
True (1)	High Values	zero	High Values	spaces
False (0)	zero	High Values	spaces	High Values

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP                                !program map
 END
GlobalErrors ErrorClass             !declare GlobalErrors object
Access:Order CLASS(FileManager)     !derive Access:Order object
       END
```

```
Order    FILE,DRIVER('TOPSPEED'),PRE(ORD),CREATE,BINDABLE,THREAD
IDKey     KEY(Ord:Cust,Ord:ID,Ord:Date),NOCASE,OPT,PRIMARY
Record    RECORD,PRE()
Cust       LONG
ID         LONG
Date       LONG
          END
         END

CODE
 !program code
 !find first order for current customer by clearing all components except Ord:Cust
 Access:Order.ClearKey( ORD:IDKey, 2 )  !clear Ord:ID and Ord:Date
 Access:Order.Fetch                     !get the next record by key
```

Close (close the file)

Close, VIRTUAL, PROC

The **Close** method tells the FileManager the calling procedure is done with the file, then closes the file if no other procedure is using it. The Close method handles any errors that occur while closing the file.

Implementation: The Close method returns a value of Level:Benign (EQUATE declared in ABERROR.INC). See *Error Class* for more information on Level:Benign and other severity levels.

Return Data Type: BYTE

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')            !declare FileManager class
 MAP                              !program map
 END

GlobalErrors ErrorClass           !declare GlobalErrors object
Access:Client CLASS(FileManager)  !derive Access:Client object
Init      PROCEDURE               !prototype Access:File init
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
       !file declaration
       END
 CODE
 GlobalErrors.Init               !initialize GlobalErrors object
 Access:Client.Init              !initialize Access:Client object
 Access:Client.Open              !open the Client file

 !program code

 Access:Client.Close             !close the Client file
 Access:Client.Kill              !shut down the Access:Client object
 GlobalErrors.Kill               !shut down the GlobalErrors object
```

Deleted (return record status)

Deleted,VIRTUAL

The **Deleted** method returns Level:Benign (declared in ABERROR.INC) if the current record is active, i.e., if the record has not been identified in some way as deleted. In cases where the DeleteRecord method has been derived to say, flag deleted records rather than physically delete them, deriving a corresponding Deleted method allows these records to be identified.

The standard Deleted method always returns Level:Benign.

Return Data Type: BYTE

Example:

```
 PROGRAM
INCLUDE('ABFILE.INC')         !declare FileManager class
 MAP . !program map
GlobalErrors ErrorClass        !declare GlobalErrors object
Access:Client CLASS(FileManager) . !derive Access:Client object
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
       PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
       ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
       PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
       ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
       BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
      END
 CODE
 !program code
 ACCEPT
 CASE FIELD()
 OF ?OK
 IF EVENT() = Event:Accepted                      !on OK button
  IF Access:Client.Deleted() = Level:Benign       !if the record is not already deleted
    IF Access;Client.DeleteRecord = Level:Benign !delete it
     POST(Event:CloseWindow)                      !if add succeeds, close down
    ELSE                                          !if add fails
     Access:Client.CancelPrimeAutoInc             !restore the file
     CYCLE                                        !and start over
    END
   END
  END
 !more code
```

See Also: DeleteRecord

DeleteRecord (delete a record)

DeleteRecord(< *query* **>),PROC,VIRTUAL**

DeleteRecord Deletes a record from a file.

query A numeric constant, variable, EQUATE, or expression that determines whether DeleteRecord offers to confirm the delete with the end user. A value of one (1 or True) deletes only on confirmation from the end user; a value of zero (0 or False) delete without confirmation. If omitted, query defaults to 1.

The **DeleteRecord** method deletes a record from the file and returns Level:Benign (declared in ABERROR.INC). The primary purpose of this method is to permit the redefinition of "Delete" where appropriate. Possible uses include flagging a record as opposed to physically deleting it or logging delete transactions as they occur. The Query parameter is provided for compatibility with the Relation Manager's Delete method (See…) RelationManager.Delete calls FileManager.DeleteRecord with Query = 1 in all cases except that where a delete has been requested without notifying the user. This allows derived versions of FileManager.DeleteRecord to physically delete a record after, say, the cancellation of autoincremented update.

The standard DeleteRecord method physically deletes the record and always returns Level:Benign.

Return Data Type: BYTE

Example:

```
 PROGRAM
INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP
 END
GlobalErrors ErrorClass            !declare GlobalErrors object
Access:Client CLASS(FileManager)   !derive Access:Client object
              END
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
       PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
       ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
       PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
       ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
       BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
       END
 CODE
 !program code
 ACCEPT
   CASE FIELD()
  OF ?OK
 IF EVENT() = Event:Accepted                        !on OK button
  IF Access:Client.DeleteRedord() = Level:Benign    !delete the new Client record
   POST(Event:CloseWindow)                          !if add succeeds, close down
   ELSE                                             !if add fails
```

```
    Access:Client.CancelPrimeAutoInc              !restore the file
    CYCLE                                         !and start over
  END
 END
!more code
```

See Also: Deleted

Destruct (automatic destructor)

Destruct, VIRTUAL

The **Destruct** method is an automatic destructor that is called when the object is removed from memory. This ensures that all data allocated by the object is removed from memory.

EqualBuffer (detect record buffer changes)

EqualBuffer(*buffer id* **), VIRTUAL**

EqualBuffer	Compares the managed file's record buffer with the specified buffer and returns a value indicating whether the buffers are equal.
buffer id	An integer constant, variable, EQUATE, or expression that identifies the buffer contents to compare--typically a value returned by the SaveBuffer method.

The **EqualBuffer** method compares the managed file's record buffer, including any MEMOs or BLOBs, with the specified buffer and returns a value indicating whether the buffers are equal. A return value of one (1 or True) indicates the buffers are equal; a return value of zero (0 or False) indicates the buffers are not equal. Assigning PROP:Handle on a BLOB field constitutes a change to the BLOB and will cause EqualBuffer() to return False.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeCloseEvent PROCEDURE
 CODE
 IF SELF.Response = RequestCancelled              !if end user cancelled the form
  IF ~SELF.Primary.Me.EqualBuffer(SELF.Saved)     !check for any pending changes
   !handle cancel of pending changes
  END
 END
```

See Also: SaveBuffer

Fetch (get a specific record by key value)

Fetch(*key* **), VIRTUAL, PROC**

Fetch	Gets a specific record by its key value and handles any errors.
key	The label of the primed KEY.

The **Fetch** method gets a specific record by its key value and handles any errors. You must prime the key before calling Fetch. If the key is not unique, Fetch gets the first record with the specified key value.

The TryFetch method provides a slightly different (manual) alternative for fetching specific records.

Implementation: Fetch tries to get the specified record. If it succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns Level:Notify (also declared in ABERROR.INC) and *clears the record buffer*. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')             !declare FileManager class
 MAP                               !program map
 END
GlobalErrors  ErrorClass           !declare GlobalErrors object
Access:States CLASS(FileManager)   !declare Access:States object
              END

States        FILE,DRIVER('TOPSPEED'),PRE(ST),CREATE,BINDABLE,THREAD
StateCodeKey   KEY(ST:StateCode),NOCASE,OPT,PRIMARY
Record         RECORD,PRE()
StateCode       STRING(2)
State           STRING(20)
               END
              END
      CODE
 !program code
 !get the state record for Florida
 ST:StateCode = 'FL'                 !prime the state key for the fetch
 Access:States.Fetch(ST:StateCodeKey)!fetch the record and handle any errors
```

See Also: TryFetch

GetComponents (return the number of key components)

GetComponents(*key* **)**

GetComponents Returns the number of components in the specified key.

key The label of the KEY.

The **GetComponents** method returns the number of components in the specified key.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')             !declare FileManager
 MAP                               !program map
 END
GlobalErrors ErrorClass            !declare GlobalErrors objec
Access:Order CLASS(FileManager)    !derive Access:Order object
        END
I       BYTE
Order     FILE,DRIVER('TOPSPEED'),PRE(ORD),THREAD    !declare order file
IDKey      KEY(Ord:Cust,Ord:ID,Ord:Date),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
Cust        LONG
ID          LONG
Date        LONG
           END
          END
KeyQueue  QUEUE,PRE(KeyQ)          !a list of key components
Field      ANY                     !component field reference
FieldName  STRING(12)              !component field name
          END
 CODE
 !program code
 LOOP Access:Order.GetComponents( ORD:IDKey ) TIMES !step thru key components
  I += 1                                           !increment counter
  KeyQ.Field    = Access:Order.GetField(ORD:IDKey,I)!get component reference
  KeyQ.FieldName  = Access:Order.GetFieldName(ORD:IDKey,I)!get component name
 END
```

GetEOF (return end of file status)

GetEOF

The **GetEOF** method returns the current end of file status for the managed file.

Tip: GetEOF is designed to be used after a call to the Next or Previous method. The GetEOF return value is undefined prior to the call to Next or Previous.

Implementation: GetEOF returns one (1 or True) if the last record in a Next/Previous series was read; otherwise it returns zero (0 or False).

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')            !declare FileManager class
 MAP                              !program map
 END
GlobalErrors ErrorClass           !declare GlobalErrors object
Access:Client CLASS(FileManager)  !derive Access:Client object
       END
 CODE
 !program code
 LOOP                             !loop through client file
  CASE Access:Client.Next()       !get next record in sequence
  OF Level:Notify OROF Level:Fatal!if error occurred
   POST(Event:CloseWindow)        !shut down
   BREAK
  ELSE                            !otherwise
   PRINT(Rpt:Detail)              !print the record
  END
 UNTIL Access:Client.GetEOF()     !stop looping at end of file
```

See Also: Next, TryNext, Previous, TryPrevious

GetError (return the current error ID)

GetError

The **GetError** method returns the current error ID for the managed file. See *Error Class* for more information on error IDs.

Return Data Type: SIGNED

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')                    !declare FileManager class
 MAP                                      !program map
  LogError(STRING filename, SHORT error)  !prototype LogError procedure
 END

GlobalErrors ErrorClass                   !declare GlobalErrors object
Access:Client CLASS(FileManager)          !derive Access:Client object
        END
ErrorLog   FILE,DRIVER('TopSpeed'),PRE(LOG),CREATE,THREAD!declare log file
Record      RECORD
Date         LONG
Time         LONG
File         STRING(20)
ErrorId      SHORT
            END
           END

 CODE
 !program code
 IF Access:Client.Open()                   !if error occurs
  LogError(Access:Client.GetName(),Access:Client.GetError())!log name and error id
 END
 !program code

LogError PROCEDURE(STRING filename, SHORT error)
 CODE
 LOG:Date   = TODAY()              !store date
 LOG:Time   = CLOCK()              !store time
 LOG:File   = filename             !store filename
 LOG:ErrorId = error               !store error id
 ADD(ErrorLog)                     !write logfile
```

GetField (return a reference to a key component)

GetField(|*key*, *component* |)

|*field tag* |

|*index*, *field tag*, *field* |

GetField	Returns a reference to the specified key component or field.
key	The label of the KEY.
component	A numeric constant, variable, EQUATE, or expression that indicates the component field to reference. A value of one (1) specifies the first component; two (2) specifies the second component, etc.
field tag	A variable length string that represents the actual field name.
index	An integer constant, variable, EQUATE or expresssion that contains the field number.
field	Represents the field name used in a queue structure.

The **GetField** method returns a reference to the specified key component or field.

GetField(key, component)
Returns a reference to the specified key component.

GetField(field tag)
Returns a reference to the field based on the specified field tag.

GetField(index, field tag, field)
Returns Level:Notifiy if no field exists at the specified index position.
Returns Level:Benign if a field is successfully retrieved at the specified index position.

Return Data Type: *?, (untyped variable parameter)
where prototype is GetField(key, component)

*?, (untyped variable parameter)
where prototype is GetField(field tag)

BYTE
where prototype is GetField(index, field tag, field)

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager
 MAP                                !program map
 END
GlobalErrors ErrorClass             !declare GlobalErrors objec
```

```
Access:Order CLASS(FileManager)      !derive Access:Order object
             END
I       BYTE
```

```
Order     FILE,DRIVER('TOPSPEED'),PRE(ORD),THREAD !declare order file
IDKey      KEY(Ord:Cust,Ord:ID,Ord:Date),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
Cust        LONG
ID          LONG
Date        LONG
           END
          END
KeyQueue  QUEUE,PRE(KeyQ)        !a list of key components
Field      ANY                   !component field reference
FieldName  STRING(12)            !component field name
          END

 CODE
 !program code
 LOOP Access:Order.GetComponents( ORD:IDKey ) TIMES      !step thru key components
  I += 1                                                 !increment counter
  KeyQ.Field     = Access:Order.GetField(ORD:IDKey,I)    !get component reference
  KeyQ.FieldName = Access:Order.GetFieldName(ORD:IDKey,I)!get component name
 END
```

GetFieldName (return a key component field name)

GetFieldName(|*key*, *component* |**), STRING**

|*field number* |

GetFieldName Returns the field name of the specified key component or field number in the record buffer.

key The label of the key.

component A numeric constant, variable, EQUATE, or expression that indicates the key component number. A value of one (1) specifies the first component; two (2) specifies the second component, etc.

field number A variable name that represents the field number in the record buffer. A value of one (1) specifies the first field in the record buffer; two (2) specifies the second field in the record buffer, etc.

The **GetFieldName** method returns a field name from the record structure.

GetFieldName(key, component)
Returns the field name based on the specified key and component. This form of the GetFieldName method returns a STRING data type.

GetFieldName(field number)
Returns the field name based on the specified field number from the record buffer. See WHO.

Return Data Type: STRING

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')                !declare FileManager
 MAP                                  !program map
 END
GlobalErrors ErrorClass               !declare GlobalErrors objec
Access:Order CLASS(FileManager)       !derive Access:Order object
        END
I       BYTE
Order     FILE,DRIVER('TOPSPEED'),PRE(ORD),THREAD  !declare order file
IDKey      KEY(Ord:Cust,Ord:ID,Ord:Date),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
Cust       LONG
ID        LONG
Date       LONG
       . .
KeyQueue  QUEUE,PRE(KeyQ)             !a list of key components
Field     ANY                         !component field reference
```

```
FieldName   STRING(12)              !component field name
      END
 CODE
 !program code
 LOOP Access:Order.GetComponents( ORD:IDKey ) TIMES      !step thru key components
  I += 1                                                 !increment counter
  KeyQ.Field     = Access:Order.GetField(ORD:IDKey,I)    !get component reference
  KeyQ.FieldName = Access:Order.GetFieldName(ORD:IDKey,I)!get component name
 END
```

GetFields(get number of fields)

GetFields

The **GetFields** method returns the number of fields in the file's record structure.

Return Data Type: LONG

GetFieldPicture(get field picture)

GetFieldPicture(*field* tag)

GetFieldPicture	Returns the field type of the specified field.
field tag	A variable length string that represents the field picture.

The **GetFieldPicture** method returns the field picture based on the specified field.

Return Data Type: ASTRING

GetFieldType(get field type)

GetFieldType(*field*)

GetFieldType	Returns the field type of the specified field.
field	A variable length string that represents the field name to be queried.

The **GetFieldType** method returns the field type based on the specified field.

Return Data Type: ASTRING

GetName (return the filename)

GetName

The **GetName** method returns the filename of the managed file for display in error messages, etc.

The SetName method sets the (variable) filename of the managed file.

Implementation: GetName returns the value of the FileNameValue property if it has a value; otherwise, it returns the value of the FileName property.

Return Data Type: STRING

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')                    !declare FileManager class
 MAP                                      !program map
LogError   (STRING filename, SHORT error)!prototype LogError procedure
 END

GlobalErrors ErrorClass                   !declare GlobalErrors object
Access:Client CLASS(FileManager)          !derive Access:Client object
       END
ErrorLog   FILE,DRIVER('TopSpeed'),PRE(LOG),CREATE,THREAD!declare log file
Record     RECORD
Date       LONG
Time       LONG
File       STRING(20)
ErrorId     SHORT
       . .
 CODE
 !program code
 IF Access:Client.Open()                                    !if error occurs
  LogError(Access:Client.GetName(),Access:Client.GetError())!log name and error id
 END
 !program code

LogError PROCEDURE(STRING filename, SHORT error)
 CODE
 LOG:Date   = TODAY()            !store date
 LOG:Time   = CLOCK()            !store time
 LOG:File   = filename           !store filename
 LOG:ErrorId = error             !store error id
 ADD(ErrorLog)                   !write logfile
```

See Also: FileName, FileNameValue, SetName

Init (initialize the FileManager object)

Init(*file, error handler* **), VIRTUAL**

Init	Initializes the FileManager object.
file	The label of the managed file.
error handler	The label of an ErrorClass object. See *Error Class* for more information.

The **Init** method initializes the FileManager object.

Implementation: The Init method does not initialize some file specific properties (Buffer, FileName, and FileNameValue). You should explicitly initialize these properties after the Init method is called (or within your derived Init method). See the Conceptual Example.

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')            !declare FileManager class
 MAP                              !program map
 END

GlobalErrors ErrorClass          !declare GlobalErrors object
Access:Client CLASS(FileManager) !derive Access:Client object
Init      PROCEDURE              !initialize Access:File object
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
         END
 CODE
 GlobalErrors.Init               !initialize the GlobalErrors object
 Access:Client.Init              !initialize Access:Client object
 !program code
 Access:Client.Kill              !shut down the Access:Client object
 GlobalErrors.Kill               !shut down the GlobalErrors object
```

```
Access:Client.Init  PROCEDURE
 CODE
 PARENT.Init(Client, GlobalErrors)!call the base class Init method
 SELF.FileNameValue = 'Client'    !set the file name
 SELF.Buffer &= CLI:Record        !point Access:Client to Client buffer
 SELF.AddKey(CLI:IDKey,'Client ID',1)   !describe the primary key
```

See Also: Buffer, File, FileName, FileNameValue

Insert (add a new record)

Insert, PROC

The **Insert** method adds a new record to the file, making sure the record is valid, and automatically incrementing key values as required. The Insert method handles any errors that occur while adding the record.

The TryInsert method provides a slightly different (manual) alternative for adding new records.

Implementation: If Insert succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns the severity level of the last error it encountered while trying to add the record. See Error Class for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')                 !declare FileManager class
 MAP .                                 !program map
GlobalErrors ErrorClass                !declare GlobalErrors object
Access:Client CLASS(FileManager)       !derive Access:Client object
              END
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
        PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
        ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
        PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
        ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
        BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
       END CODE
 !program code
 ACCEPT
  CASE FIELD()
  OF ?OK
   IF EVENT() = Event:Accepted          !on OK button
    IF Access:Client.Insert() = Level:Benign !add the new Client record
     POST(Event:CloseWindow)            !if add succeeds, close down
    ELSE                                !if add fails
     Access:Client.CancelPrimeAutoInc   !restore the file
     CYCLE                              !and start over
   . .
 !more code
```

See Also: TryInsert, PrimeRecord

KeyToOrder (return ORDER expression for a key)

KeyToOrder(*key, component* **)**

KeyToOrder	Returns an ORDER attribute expression list (for a VIEW) that mimics the specified key components.
key	The label of the KEY.
component	A numeric constant, variable, EQUATE, or expression that indicates the first component field to include in the expression. A value of one (1) specifies the first component; two (2) specifies the second component, etc.

The **KeyToOrder** method returns an ORDER attribute expression list (for a VIEW) that mimics the specified key components. The expression list includes the specified component field plus all the subsequent component fields in the key.

See the *Language Reference* for more information on ORDER.

Implementation: The *component* defaults to one (1). The maximum length of the returned expression is 512 characters.

Return Data Type: STRING

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')                  !declare FileManager
 MAP                                    !program map
 END

GlobalErrors ErrorClass                 !declare GlobalErrors
Access:Order CLASS(FileManager)         !derive Access:Order
        END
Order FILE,DRIVER('TOPSPEED'),PRE(ORD),THREAD    !declare order file
IDKey   KEY(ORD:Cust,ORD:ID,ORD:Date),NOCASE,OPT,PRIMARY
Record  RECORD,PRE()
Cust     LONG
ID       LONG
Date     LONG
        END
       END
```

```
ClientView  VIEW(Order)                 !declare order view
             PROJECT(ORD:Cust,ORD:ID,ORD:Date)
            END
 CODE
 !program code
 ClientView{PROP:Order}=Access:Order.KeyToOrder(ORD:IDKey,2)!set runtime view order
 !ClientView{PROP:Order}='ORD:ID,ORD:Date'        !equivalent to this
 OPEN(ClientView)
 SET(ClientView)
```

Kill (shutdown the FileManager object)

Kill, VIRTUAL

The **Kill** method disposes any memory allocated during the object's lifetime and performs any other necessary termination code.

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')            !declare FileManager class
 MAP                              !program map
 END

GlobalErrors ErrorClass           !declare GlobalErrors object
Access:Client CLASS(FileManager)  !derive Access:Client object
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END
 CODE
 GlobalErrors.Init                !initialize the GlobalErrors object
 Access:Client.Init               !initialize Access:Client object
 !program code
 Access:Client.Kill               !shut down the Access:Client object
 GlobalErrors.Kill
```

Next (get next record in sequence)

Next, PROC

The **Next** method gets the next record in sequence. The Next method handles any errors, except end of file, that occur while getting the record.

The TryNext method provides slightly different (manual) alternative for getting records in sequence.

Implementation: If Next succeeds, it returns Level:Benign (declared in ABERROR.INC). If it ultimately fails, it returns the severity level of the last error it encountered while trying to get the next record. See Error Class for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class

Access:Client CLASS(FileManager)    !derive Access:Client object
       END
 CODE
 !program code
 LOOP                               !loop through client file
  CASE Access:Client.Next()         !get next record in sequence
  OF Level:Notify OROF Level:Fatal !if error occurred
   POST(Event:CloseWindow)          !shut down
   BREAK
  ELSE                              !otherwise
   PRINT(Rpt:Detail)                !print the record
  END
 END
```

See Also: TryNext

Open (open the file)

Open, VIRTUAL, PROC

The **Open** method tells the FileManager the calling procedure is using the file, then OPENs the file if it is not already open. The Open method handles any errors that occur while opening the file, including creating the file and rebuilding keys if necessary.

The TryOpen method provides slightly different (manual) alternative for opening files.

Implementation: If the file does not exist and the Create property is not zero, Open tries to create the file. If Open succeeds, it returns Level:Benign (declared in ABERROR.INC). If it ultimately fails, it returns the severity level of the last error it encountered while trying to open the file. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')            !declare FileManager class

GlobalErrors ErrorClass           !declare GlobalErrors object
Access:Client CLASS(FileManager)  !derive Access:Client object
Init          PROCEDURE           !prototype Access:File init
              END

Client FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
       !file declaration
       END
 CODE
 GlobalErrors.Init                !initialize GlobalErrors object
 Access:Client.Init               !initialize Access:Client object
 Access:Client.Open               !open the Client file

 !program code

 Access:Client.Close              !close the Client file
 Access:Client.Kill               !shut down the Access:Client object
 GlobalErrors.Kill                !shut down the GlobalErrors object
```

See Also: Create, TryOpen

Position (return the current record position)

Position

The **Position** method returns the unique position of the current record.

The TryReget method retrieves a record based on the value returned by Position.

Implementation: Position returns the POSITION of the primary key if there is one; otherwise it returns the file POSITION. See the *Language Reference* for more information on POSITION.

Return Data Type: STRING

Example:

```
Hold = SELF.Position()
PUT( SELF.File )
CASE ERRORCODE()
OF NoError
OF RecordChangedErr
 SELF.SetError(Msg:ConcurrencyFailedFromForm)
 SELF.Throw
 WATCH( SELF.File )
 SELF.TryReget(Hold)
ELSE
 SELF.SetError(Msg:PutFailed)
 RETURN SELF.Throw()
END
```

See Also: TryReget

PostDelete(trigger delete action post-processing)

PostDelete(*ErrCode, ErrMsg* **),** *returncode*

PostDelete	Returns confirmation that valid dictionary trigger activity has occurred after delete action, and optionally sets an error code and message to be processed.
ErrCode	A string constant, variable, EQUATE, or expression that represents an error code.
ErrMsg	A string constant, variable, EQUATE, or expression that represents an error message.
returncode	Indicates if an error occurs.

The **PostDelete** method is a virtual method that returns a TRUE value by default if post delete trigger activity was processed normally. The developer must set the return level to FALSE if any problem occurred in the post delete trigger activity code. When PostDelete returns FALSE, an ERRORCODE 100 (trigger error) is posted. If *ErrCode* is set, then FILEERRORCODE will be set to the contents of *ErrCode* when the error is processed by the ErrorClass object for the associated file (table). Similarly, FILEERROR will be set to *ErrMsg*.

The PostDelete method is accessible from a table's trigger properties located in the Dictionary Editor, or, in the Global Embeds of a target application

Implementation: PostDelete is implemented using the file driver callback mechanism, therefore, this method will have access to all variables that the File Manager has access to. These variables and the ones added in the Data section of the method will allow the developer to insert code that will be executed after a DELETE action for a file.

Return Data Type: BYTE

Example:

```
  CODE
!Push any pending errors on stack, to allow trigger error detection
  PUSHERRORS()
  ReturnValue = PARENT.PostDelete(ErrCode,ErrMsg) !returns TRUE by default
  !trigger processing here – optionally set ErrCode, ErrMsg and ReturnValue
  POPERRORS()
!restore errors saved on the stack
  RETURN ReturnValue
```

See Also: PreDelete

PostInsert

PostUpdate

PostInsert(trigger insert action post-processing)

PostInsert(*ErrCode, ErrMsg* **),** *returncode*

PostInsert	Returns confirmation that valid dictionary trigger activity has occurred after an insert action, and optionally sets an error code and message to be processed.
ErrCode	A string constant, variable, EQUATE, or expression that represents an error code.
ErrMsg	A string constant, variable, EQUATE, or expression that represents an error message.
returncode	Indicates if an error occurs.

The **PostInsert** method is a virtual method that returns a TRUE value by default if post insert trigger activity was processed normally. The developer must set the return level to FALSE if any problems occurred in the post insert trigger activity code. When **PostInsert** returns FALSE, an ERRORCODE 100 (trigger error) is posted. If *ErrCode* is set, then FILEERRORCODE will be set to the contents of *ErrCode* when the error is processed by the ErrorClass object for the associated file (table). Similarly, FILEERROR will be set to *ErrMsg*.

The PostInsert method is accessible from a table's trigger properties located in the Dictionary Editor, or, in the Global Embeds of a target application

Implementation: PostInsert is implemented using the file driver callback mechanism, therefore, this method will have access to all variables that the File Manager has access to. These variables and the ones added in the Data section of the method will allow the developer to insert code that will be executed after an INSERT action for a file.

Return Data Type: BYTE

Example:

```
  CODE
!Push any pending errors on stack, to allow trigger error detection
  PUSHERRORS()
  ReturnValue = PARENT.PostInsert(ErrCode,ErrMsg) !returns TRUE by default
  !trigger processing here – optionally set ErrCode, ErrMsg and ReturnValue
  POPERRORS()
!restore errors saved on the stack
  RETURN ReturnValue
```

See Also: PreDelete

PostDelete

PostUpdate

PostUpdate(trigger update action post-processing)

PostUpdate(*ErrCode, ErrMsg* **),** *returncode*

PostUpdate	Returns confirmation that valid dictionary trigger activity has occurred after an insert action, and optionally sets an error code and message to be processed.
ErrCode	A string constant, variable, EQUATE, or expression that represents an error code.
ErrMsg	A string constant, variable, EQUATE, or expression that represents an error message.
returncode	Indicates if an error occurs.

The **PostUpdate** method is a virtual method that returns a TRUE value by default if post update trigger activity was processed normally. The developer must set the return level to FALSE if any problems occurred in the post update trigger activity code. When PostUpdate returns FALSE, an ERRORCODE 100 (trigger error) is posted. If *ErrCode* is set, then FILEERRORCODE will be set to the contents of *ErrCode* when the error is processed by the ErrorClass object for the associated file (table). Similarly, FILEERROR will be set to *ErrMsg*.

The PostUpdate method is accessible from a table's trigger properties located in the Dictionary Editor, or, in the Global Embeds of a target application

Implementation: PostUpdate is implemented using the file driver callback mechanism, therefore, this method will have access to all variables that the File Manager has access to. These variables and the ones added in the Data section of the method will allow the developer to insert code that will be executed after a CHANGE action for a file.

Return Data Type: BYTE

Example:

```
  CODE
!Push any pending errors on stack, to allow trigger error detection
  PUSHERRORS()
  ReturnValue = PARENT.PostUpdate(ErrCode,ErrMsg) !returns TRUE by default
  !trigger processing here – optionally set ErrCode, ErrMsg and ReturnValue
  POPERRORS()
!restore errors saved on the stack
  RETURN ReturnValue
```

See Also: PreDelete

PostDelete

PostInsert

PreDelete(trigger delete action pre-processing)

PreDelete(*ErrCode, ErrMsg* **),** *returncode*

PreDelete	Returns confirmation that valid dictionary trigger activity has occurred before a delete action is executed, and optionally sets an error code and message to be processed.
ErrCode	A string constant, variable, EQUATE, or expression that represents an error code.
ErrMsg	A string constant, variable, EQUATE, or expression that represents an error message.
returncode	Indicates if an error occurs.

The **PreDelete** method is a virtual method that returns a TRUE value by default if pre-delete trigger activity was processed normally. The developer must set the return level to FALSE if any problems occurred in the pre-delete trigger activity code. When **PreDelete** returns FALSE, an ERRORCODE 100 (trigger error) is posted. If *ErrCode* is set, then FILEERRORCODE will be set to the contents of *ErrCode* when the error is processed by the ErrorClass object for the associated file (table). Similarly, FILEERROR will be set to *ErrMsg*.

The **PreDelete** method is accessible from a table's trigger properties located in the Dictionary Editor, or, in the Global Embeds of a target application

Implementation: **PreDelete** is implemented using the file driver callback mechanism, therefore, this method will have access to all variables that the File Manager has access to. These variables and the ones added in the Data section of the method will allow the developer to insert code that will be executed after a CHANGE action for a file.

Return Data Type: BYTE

Example:

```
  CODE
!Push any pending errors on stack, to allow trigger error detection
  PUSHERRORS()
  ReturnValue = PARENT.PreDelete(ErrCode,ErrMsg) !returns TRUE by default
  !trigger processing here – optionally set ErrCode, ErrMsg and ReturnValue
  POPERRORS()
!restore errors saved on the stack
  RETURN ReturnValue
```

See Also: PostDelete

PreInsert

PreUpdate

PreInsert(trigger insert action pre-processing)

PreInsert(*OpCode, AddLength ErrCode, ErrMsg* **),** *returncode*

PreInsert	Returns confirmation that valid dictionary trigger activity has occurred before an insert action, and optionally sets an error code and message to be processed.
OpCode	A SIGNED integer that indicates the type of ADD that will be attempted.
AddLength	An UNSIGNED integer that indicates the record length about to be added when the ADD (File, Length) mode is active.
ErrCode	A string constant, variable, EQUATE, or expression that represents an error code.
ErrMsg	A string constant, variable, EQUATE, or expression that represents an error message.
returncode	Indicates if an error occurs.

The **PreInsert** method is a virtual method that returns a TRUE value by default if pre-insert trigger activity was processed normally. The developer must set the return level to FALSE if any problems occurred in the pre-insert trigger activity code. When **PreInsert** returns FALSE, an ERRORCODE 100 (trigger error) is posted. If *ErrCode* is set, then FILEERRORCODE will be set to the contents of *ErrCode* when the error is processed by the ErrorClass object for the associated file (table). Similarly, FILEERROR will be set to *ErrMsg*.

The *OpCode* and *AddLength* parameters can be used in your pre-processing trigger code.

DriverOp:ADD	ADD(FILE)
DriverOp:Append	APPEND(FILE)
DriverOP:AddLen	ADD(FILE,LENGTH)
DriverOp:AppendLen	APPEND(FILE,LENGTH)

Use the Equates provided in EQUATES.CLW (shown above) to test the *OpCode*. *AddLength* is used to return the value of the length parameter if used with ADD.

The **PreInsert** method is accessible from a table's trigger properties located in the Dictionary Editor, or, in the Global Embeds of a target application

Implementation: PreInsert is implemented using the file driver callback mechanism, therefore, this method will have access to all variables that the File Manager has access to. These variables and the ones added in the Data section of the method will allow the developer to insert code that will be executed before an INSERT action for a file.

Return Data Type: BYTE

Example:

```
CODE
PUSHERRORS()
ReturnValue = PARENT.PreInsert(OpCode,AddLen,ErrCode,ErrMsg)
 MESSAGE('Trigger Test Before Insert')
 !Trigger code entered here
POPERRORS()
RETURN ReturnValue
```

See Also: PostInsert, PreDelete, PreUpdate

PreUpdate(trigger update action pre-processing)

PreUpdate(*Pointer, PutLength, ErrCode, ErrMsg* **),** *returncode*

PreUpdate Returns confirmation that valid dictionary trigger activity has occurred before an attempted action, and optionally sets an error code and message to be processed.

Pointer A LONG that represents the file pointer to be written if PUT (File, Pointer) or PUT (File, Pointer, Length) is used.

PutLength An UNSIGNED integer that represents the number of bytes to write to the file when PUT (File, Pointer, Length) is used.

ErrCode A string constant, variable, EQUATE, or expression that represents an error code.

ErrMsg A string constant, variable, EQUATE, or expression that represents an error message.

returncode Indicates if an error occurs.

The **PreUpdate** method is a virtual method that returns a TRUE value by default if pre-update trigger activity was processed normally. The developer must set the return level to FALSE if any problems occurred in the pre-update trigger activity code. When **PreUpdate** returns FALSE, an ERRORCODE 100 (trigger error) is posted. If *ErrCode* is set, then FILEERRORCODE will be set to the contents of *ErrCode* when the error is processed by the ErrorClass object for the associated file (table). Similarly, FILEERROR will be set to *ErrMsg*.

The **PreUpdate** method is accessible from a table's trigger properties located in the Dictionary Editor, or, in the Global Embeds of a target application

Implementation: PreUpdate is implemented using the file driver callback mechanism, therefore, this method will have access to all variables that the File Manager has access to. These variables and the ones added in the Data section of the method will allow the developer to insert code that will be executed after a CHANGE action for a file.

Return Data Type: BYTE

Example:

```
  CODE
!Push any pending errors on stack, to allow trigger error detection
  PUSHERRORS()
  ReturnValue = PARENT.PreUpdate(ErrCode,ErrMsg) !returns TRUE by default
  !trigger processing here – optionally set ErrCode, ErrMsg and ReturnValue
  POPERRORS()
!restore errors saved on the stack
  RETURN ReturnValue
```

See Also: PreDelete

PostDelete

PostInsert

Previous (get previous record in sequence)

Previous, PROC

The **Previous** method gets the previous record in sequence. The Previous method handles any errors that occur while getting the record.

The TryPrevious method provides a slightly different (manual) alternative for getting records in sequence.

Implementation: If Previous succeeds, it returns Level:Benign (declared in ABERROR.INC). If it ultimately fails, it returns the severity level of the last error it encountered while trying to get the previous record. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class

Access:Client CLASS(FileManager)    !derive Access:Client object
       END
 CODE
 !program code
 LOOP                               !loop through client file
  CASE Access:Client.Previous()     !get previous record in sequence
  OF Level:Notify OROF Level:Fatal !if error occurred
   POST(Event:CloseWindow)          !shut down
   BREAK
  ELSE                              !otherwise
   PRINT(Rpt:Detail)                !print the record
  END
 END
```

See Also: TryPrevious

PrimeAutoInc (prepare an autoincremented record for adding)

PrimeAutoInc, VIRTUAL, PROC

When a record is inserted, the **PrimeAutoInc** method prepares an autoincremented record for adding to the managed file and handles any errors it encounters. If you want to provide an update form that displays the auto-inremented record ID or where RI is used to keep track of children, then you should use the PrimeAutoInc method to prepare the record buffer.

The TryPrimeAutoInc method provides a slightly different (manual) alternative for preparing autoincremented records.

The CancelAutoInc method restores the managed file to its pre-PrimeAutoInc state.

Implementation: The PrimeRecord method calls PrimeAutoInc if the file contains an autoincrementing key.

If PrimeAutoInc succeeds, it returns Level:Benign (declared in ABERROR.INC). If it ultimately fails, it returns the severity level of the error it encountered while trying to prime the record. See Error Class for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP                                !program map
 END
GlobalErrors ErrorClass             !declare GlobalErrors object
Access:Client CLASS(FileManager)    !derive Access:Client object
Init      PROCEDURE                 !initialize Access:File object
PrimeAutoInc  PROCEDURE,VIRTUAL     !prepare new record for adding
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
        PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
```

```
        ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
        PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
        ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
        BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
        BUTTON('Cancel'),AT(82,53,45,14),USE(?Cancel)
       END
 CODE
 GlobalErrors.Init               !initialize GlobalErrors object
 Access:Client.Init              !initialize Access:Client object
 Access:Client.Open               !open the Client file
 IF Access:Client.PrimeAutoInc()  !prime Client record
  POST(Event:CloseWindow)         !if prime fails, close down
 END

 OPEN(InsertWindow)
 ACCEPT
  CASE FIELD()
  OF ?OK
   IF EVENT() = Event:Accepted    !on OK button
    IF Access:Client.Insert() = Level:Benign !finish adding the new Client record
     POST(Event:CloseWindow)      !if add succeeds, close down
    ELSE                          !if add fails
     SELECT(?CLI:Name:Prompt)     !select client name field
     CYCLE                        !and start over
    END
   END
  OF ?Cancel
   IF EVENT() = EVENT:Accepted    !on Cancel button
    Access:Client.CancelAutoInc   !restore Client to pre-PrimeRecord
    POST(Event:CloseWindow)       !close down
   END
  EMD
 END

 Access:Client.Close              !close the Client file
 Access:Client.Kill               !shut down the Access:Client object
 GlobalErrors.Kill                !shut down the GlobalErrors object
 RETURN

Access:Client.PrimeAutoInc PROCEDURE
 CODE
 !your custom code here
 PARENT.PrimeAutoInc              !call the base class method
 !your custom code here
```

See Also: CancelAutoInc, PrimeRecord, TryPrimeAutoInc

PrimeFields (a virtual to prime fields)

PrimeFields, VIRTUAL

The **PrimeFields** method is a virtual placeholder method to prime fields before adding a record.

Implementation: The ABC Templates use the PrimeFields method to implement field priming specified in the Data Dictionary.

The PrimeRecord method calls the PrimeFields method before calling the PrimeAutoInc method. You can use the PrimeRecord method to prime the nonincrementing components of an autoincrementing key.

Example:

```
Access:Customer.PrimeFields PROCEDURE
 CODE
 CLI:StateCode = 'FL'
```

PrimeRecord (prepare a record for adding:FileManager)

PrimeRecord([*suppress clear*] **), VIRTUAL, PROC**

PrimeRecord Prepares a record for adding to the managed file.

suppress clear An integer constant, variable, EQUATE, or expression that indicates whether or not to clear the record buffer. A value of zero (0 or False) clears the buffer; a value of one (1 or True) does not clear the buffer. If omitted, *suppress clear* defaults to zero (0).

The **PrimeRecord** method prepares a record for adding to the managed file and returns a value indicating success or failure. A return value of Level:Benign indicates success; any other return value indicates a problem.

Implementation: PrimeRecord prepares the record by optionally clearing the record buffer, then calling the PrimeFields method to prime field values, and the PrimeAutoInc method to increment autoincrementing key values. If it succeeds, it returns Level:Benign (declared in ABERROR.INC), otherwise it returns the severity level of the last error it encountered. See *Error Class* for more information on severity levels. The *suppress clear* parameter lets you clear or retain any other values in the record buffer.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP                                !program map
 END

GlobalErrors ErrorClass             !declare GlobalErrors object
Access:Client CLASS(FileManager)    !derive Access:Client object
Init      PROCEDURE                 !initialize Access:File object
PrimeAutoInc  PROCEDURE,VIRTUAL     !prepare new record for adding
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey     KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END
```

```
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
        PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
        ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
        PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
        ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
        BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
        BUTTON('Cancel'),AT(82,53,45,14),USE(?Cancel)
       END
 CODE
 GlobalErrors.Init               !initialize GlobalErrors object
 Access:Client.Init              !initialize Access:Client object
 Access:Client.Open              !open the Client file
 IF Access:Client.PrimeRecord()  !prime Client record
  POST(Event:CloseWindow)        !if prime fails, close down
 END
 OPEN(InsertWindow)
 ACCEPT
  CASE FIELD()
  OF ?OK
   IF EVENT() = Event:Accepted   !on OK button
    IF Access:Client.Insert() = Level:Benign !finish adding the new Client record
     POST(Event:CloseWindow)     !if add succeeds, close down
    ELSE                         !if add fails
     SELECT(?CLI:Name:Prompt)    !select client name field
     CYCLE                       !and start over
    END
   END
  OF ?Cancel
   IF EVENT() = EVENT:Accepted   !on Cancel button
    Access:Client.CancelAutoInc  !restore Client to pre-PrimeRecord
    POST(Event:CloseWindow)      !close down
   END
  EMD
 END

 Access:Client.Close             !close the Client file
 Access:Client.Kill              !shut down the Access:Client object
 GlobalErrors.Kill               !shut down the GlobalErrors object
 RETURN

Access:Client.PrimeAutoInc PROCEDURE
 CODE
 !your custom code here
 PARENT.PrimeAutoInc             !call the base class method
 !your custom code here
```

See Also: PrimeAutoInc, CancelAutoInc

RestoreBuffer (restore a previously saved record buffer)

RestoreBuffer(*buffer id* [, *restore*] **)**

RestoreBuffer Restores previously saved record buffer contents.

buffer id An integer constant, variable, EQUATE, or expression that identifies the buffer contents to restore--this is a value returned by the SaveBuffer method.

restore An integer constant, variable, EQUATE, or expression that indicates whether to restore the managed file's buffer contents, or simply DISPOSE of the specified buffer. A value of one (1 or True) updates the file's Buffer; a value of zero (0 or False) does not update the file's Buffer. If omitted, *restore* defaults to True.

The **RestoreBuffer** method restores record buffer contents to the managed file's record buffer (the Buffer property). RestoreBuffer restores values previously saved by the SaveBuffer method, including MEMO fields.

Implementation: The RestoreBuffer method releases memory allocated by the SaveBuffer method. Therefore, to prevent a memory leak, each call to SaveBuffer should be paired with a corresponding call to RestoreBuffer. The RestoreBuffer method retrieves and DISPOSEs the specified contents from the Buffers property.

Example:

```
FileManager.RestoreFile PROCEDURE(*USHORT Id)
  CODE
 IF ~SELF.UseFile()
  SELF.Saved.Id = Id
  GET(SELF.Saved,SELF.Saved.Id)
  ASSERT(~ERRORCODE())
  IF SELF.Saved.Key &= NULL
   RESET(SELF.File,SELF.Saved.Pos)
  ELSE
   RESET(SELF.Saved.Key,SELF.Saved.Pos)
  END
  IF SELF.Saved.WHeld
   HOLD(SELF.File)
  END
  IF SELF.Saved.WWatch
   WATCH(SELF.File)
  END
  NEXT(SELF.File)
  SELF.RestoreBuffer(SELF.Saved.Buffer)
  DELETE(SELF.Saved)
  Id = 0
 END
```

See Also: Buffer, Buffers, SaveBuffer

RestoreFile (restore a previously saved file state)

RestoreFile(*filestateid,dorestore* **)**

RestoreFile	Restores a previously saved file state.
filestateid	A USHORT returned by the SaveFile method that identifies the file state to restore.
dorestore	An boolean integer constant, variable, EQUATE, or expression to indicate whether or not to perform the restoration. If omitted, the default of TRUE (1) is implied.

The **RestoreFile** method restores the specified file state for the managed file. RestoreFile restores from states previously saved by the SaveFile method.

Implementation: The RestoreFile method restores file position, as well as any active HOLD or WATCH. RestoreFile calls the RestoreBuffer method to restore the managed file's record buffer contents.

Example:

```
SaveState USHORT                        !must be a USHORT
 CODE
 SaveState = Access:MyFile.SaveFile()   !save the file state
 SET(MyKey,MyKey)                       !access the file (change the file state)
 LOOP UNTIL Access:MyFile.Next()
  !Check range limits here
  !Process the record here
 END
 Access:MyFile.RestoreFile(SaveState)   !restore the previously saved file state
```

See Also: SaveFile, RestoreBuffer

SaveBuffer (save a copy of the record buffer)

SaveBuffer

The **SaveBuffer** method saves a copy of the managed file's record buffer contents (the Buffer property) and returns a number that uniquely identifies the saved record. SaveBuffer stores buffer contents for subsequent retrieval by the RestoreBuffer method.

Implementation: SaveBuffer saves MEMO contents as well as other fields.

SaveBuffer allocates memory which is subsequently released by the RestoreBuffer method. Therefore, to prevent a memory leak, each call to SaveBuffer should be paired with a corresponding call to RestoreBuffer.

Return Data Type: USHORT

Example:

```
FileManager.SaveFile PROCEDURE
Id LONG,AUTO
I  SHORT,AUTO
  CODE
    Id = RECORDS(SELF.Saved)
    IF Id
      GET(SELF.Saved,Id)
      ASSERT(~ERRORCODE())
      Id = SELF.Saved.Id + 1
    ELSE
      Id = 1
    END
    SELF.Saved.Id = Id
    SELF.Saved.Buffer = SELF.SaveBuffer()
    SELF.Saved.Key &= SELF.File{PROP:CurrentKey}
    SELF.Saved.WHeld = SELF.File{PROP:Held}
    SELF.Saved.WWatch = SELF.File{PROP:Watched}
    IF SELF.Saved.Key &= NULL
      SELF.Saved.Pos = POSITION(SELF.File)
    ELSE
      SELF.Saved.Pos = POSITION(SELF.Saved.Key)
    END
    ADD(SELF.Saved)
    RETURN Id
```

See Also: Buffer, Buffers, RestoreBuffer

SaveFile (save the current file state)

SaveFile

The **SaveFile** method saves the managed file's current state and returns a number that uniquely identifies the saved state. SaveFile saves the managed file's state for subsequent restoration by the RestoreFile method.

Implementation: The SaveFile method saves file position, as well as any active HOLD or WATCH. SaveFile calls the SaveBuffer method to save a copy of the managed file's record buffer contents.

Return Data Type: USHORT

Example:

```
SaveState USHORT                          !must be a USHORT
 CODE
 SaveState = Access:MyFile.SaveFile()     !save the file state
 SET(MyKey,MyKey)                         !access the file (change the file state)
 LOOP UNTIL Access:MyFile.Next()
  !Check range limits here
  !Process the record here
 END
 Access:MyFile.RestoreFile(SaveState)     !restore the previously saved file state
```

See Also: RestoreFile, SaveBuffer

SetError (save the specified error and underlying error state)

SetError(*error id* **)**

SetError	Saves the specified error and the underlying error state for use by the Throw method, etc.
error id	A numeric constant, variable, EQUATE, or expression that identifies the error. See *Error Class* for more information on error id.

The **SetError** method saves the specified error and underlying error state for use by the Throw method, etc.

Example:

```
Access:Client.Next FUNCTION(BYTE HandleError) !Next function
 CODE                              !with alternative error handling
 LOOP
  NEXT( SELF.File )                !get the next record
  CASE ERRORCODE()                 !check for error conditions
  OF BadRecErr OROF NoError
   RETURN Level:Benign
  OF IsHeldErr                     !if record is HELD by another
   SELF.SetError(Msg:RecordHeld)   !make RecordHeld the current error
   IF HandleError                  !if interactive error handling
    RETURN SELF.Throw()            !pass current error to error handler
   ELSE                            !otherwise (silent error handling)
    RETURN Level:Notify            !return error code to caller
   END
  END
 END
```

See Also: Throw

SetErrors (set the error class used)

SetErrors(*ErrorClass* **)**

SetErrors	Sets the Error Class that the file manager uses.
ErrorClass	The label of the ErrorClass object.

The new SetErrors() method of the file manager allows you to set the error class that the file manager uses after it has been initialized.

Example:

```
DLLInitializer.Construct PROCEDURE

  CODE
  !Initialize the local INI manager to use windows INI file
  LocalINIMgr.Init('allfiles.INI', NVD_INI)

  INIMgr &= LocalINIMgr

  FuzzyMatcher.Init                       ! Init the browse 'fuzzy matcher'
  FuzzyMatcher.SetOption(MatchOption:NoCase, 1)  ! Configure case matching
  FuzzyMatcher.SetOption(MatchOption:WordOnly, 0)! Configure 'word only' matching

!These procedures are used to initialize the DLL.
!It must be called by the main executable when it starts up

allfiles:Init PROCEDURE(<ErrorClass curGlobalErrors>, <INIClass curINIMgr>)

  CODE
  IF ~curGlobalErrors &= NULL
    GlobalErrors &= curGlobalErrors
  END
  IF ~curINIMgr &= NULL
    INIMgr &= curINIMgr
  END
  Access:Customer.SetErrors(GlobalErrors)
  Access:Orders.SetErrors(GlobalErrors)
  Access:Detail.SetErrors(GlobalErrors)
  Access:Products.SetErrors(GlobalErrors)
  Access:Phones.SetErrors(GlobalErrors)
```

SetKey (set current key)

SetKey(*key* **), PROTECTED**

SetKey	Makes the specified key current for use by other FileManager methods.
key	The label of the KEY.

The **SetKey** method makes the specified key the current one for use by other FileManager methods.

Example:

```
FileManager.GetComponents FUNCTION(KEY K) !returns the number of key components
 CODE
 SELF.SetKey(K)                           !locate the specified key
 RETURN RECORDS( SELF.Keys.Fields )       !count the components
```

SetName (set current filename)

SetName(*filename* **)**

SetName	Sets the variable filename of the managed file.
filename	A string constant, variable, EQUATE, or expression that contains the filename of the managed file.

The **SetName** method sets the variable filename (NAME attribute) of the managed file. This value determines which file is actually opened and processed by the FileManager object. The filename is also displayed in error messages, etc.

The GetName method returns the name of the managed file.

Implementation: SetName assumes the FileName property is a reference to the file's NAME attribute variable.

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')          !declare FileManager class
 MAP .                          !program map
ClientFile  STRING(8)           !client filename variable
GlobalErrors ErrorClass         !declare GlobalErrors object
Access:Client CLASS(FileManager)!derive Access:Client object
Init      PROCEDURE             !initialize Access:File object
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),THREAD,NAME(CLientFile)
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END
 CODE
 GlobalErrors.Init              !initialize the GlobalErrors object
 Access:Client.Init             !initialize the Access:Client object
 LOOP I# = 1 TO 12              !step through 12 monthly files
  Access:Client.SetName('Client'&I#) !set the filename variable
  Access:Client.Open            !open the monthly file
  !process the file
  Access:Client.Close           !close the monthly file
 END
```

```
Access:Client.Init  PROCEDURE
 CODE
 PARENT.Init(GlobalErrors)      !call the base class Init method
 SELF.File &= Client            !point Access:Client to Client file
 SELF.Buffer &= CLI:Record      !point Access:Client to Client buffer
 SELF.FileName &= ClientFile    !point Access:Client to the filename variable
```

See Also: FileName, FileNameValue, GetName

Throw (pass an error to the error handler for processing)

Throw([*error id*] **), VIRTUAL, PROC**

Throw	Passes the specified error to the error handler object for processing.
error id	A numeric constant, variable, EQUATE, or expression that indicates the error to process. If omitted, Throw processes the current error--that is , the error identified by the previous call to SetError or Throw.

The **Throw** method passes the current (last encountered) error to the nominated error handler for processing, including FILEERROR() and FILEERRORCODE() values, then returns the severity level of the error.

Implementation: The SetError method saves the specified error and underlying error state for use by the Throw method. See *Error Class* for more information on error ids and severity levels.

The Init method receives and sets the error handler object.

Return Data Type: BYTE

Example:

```
Access:Client.Next FUNCTION(BYTE HandleError)!Next function
 CODE                                        !with alternative error handling
 LOOP
  NEXT( SELF.File )                          !get the next record
  CASE ERRORCOD()                            !check for error conditions
  OF BadRecErr OROF NoError
   RETURN Level:Benign
  OF IsHeldErr                               !if record is HELD by another
   SELF.SetError(Msg:RecordHeld)             !make RecordHeld the current error
   IF HandleError                            !if interactive error handling
    RETURN SELF.Throw()                      !pass current error to error handler
   ELSE                                      !otherwise (silent error handling)
    RETURN Level:Notify                      !return error code to caller
  END
  END
 END
```

See Also: Init, SetError

ThrowMessage (pass an error and text to the error handler)

ThrowMessage(*error id, text* **), VIRTUAL, PROC**

ThrowMessage

Passes the specified error and text to the error handler object for processing.

error id A numeric constant, variable, EQUATE, or expression that indicates the error to process.

text A string constant, variable, EQUATE, or expression to include in the error message.

The **ThrowMessage** method passes the specified error, including FILEERROR() and FILEERRORCODE() values, and text to the error handler object for processing, then returns the severity level of the error. See *Error Class* for more about error ids and severity levels.

Implementation: The Init method receives and sets the error handler. The incorporation of the *text* into the error message depends on the error handler. See *Error Class*.

Return Data Type: BYTE

Example:

```
GlobalErrors ErrorClass                          !declare GlobalErrors object

Access:Client CLASS(FileManager)                 !derive Access:Client object
ValidateField FUNCTION(UNSIGNED Id),BYTE,VIRTUAL !prototype Access:File validation
              END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END
```

```
 CODE
 !program code

Access:Client.ValidateField FUNCTION(UNSIGNED Id)
 CODE
 IF ID = 3                   !validate statecode (3rd) field
  IF ~CLI:StateCode          !if no statecode,
  !pass error & text to error handler
  RETURN Access:Client.ThrowMessage(Msg:RequiredField,'StateCode')
  END
 END
 RETURN(LEVEL:Notify)
```

See Also: Init

TryFetch (try to get a specific record by key value)

TryFetch(*key* **), VIRTUAL, PROC**

TryFetch Gets a specific record by its key value.

key The label of the primed KEY.

The **TryFetch** method gets a specific record by its key value. You must prime the key before calling TryFetch. If the key is not unique, TryFetch gets the first record with the specified key value.

The Fetch method provides a slightly different (automatic) alternative for fetching specific records.

Implementation: Fetch tries to get the specified record. If it succeeds, it returns Level:Benign. If it fails, it returns Level:Notify and does not clear the record buffer. See *Error Class* for more information on Level:Benign and Level:Notify.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP                                !program map
 END
GlobalErrors  ErrorClass            !declare GlobalErrors object
Access:States CLASS(FileManager)    !declare Access:States object
              END

States     FILE,DRIVER('TOPSPEED'),PRE(ST),CREATE,BINDABLE,TREAD
StateCodeKey  KEY(ST:StateCode),NOCASE,OPT,PRIMARY
Record        RECORD,PRE()
StateCode      STRING(2)
State          STRING(20)
              END
            END

  CODE
 !program code
 !get the state record for Florida
 ST:StateCode = 'FL'                        !prime the state key for the fetch
 IF Access:States.TryFetch(ST:StateCodeKey)!fetch the record
  GlobalErrors.Throw(Msg:FieldNotInFile)    !handle any errors yourself
 END
```

See Also: Fetch

TryInsert (try to add a new record)

TryInsert, PROC

The **TryInsert** method adds a new record to the file, making sure the record is valid, and automatically incrementing key values as required. The TryInsert method does not attempt to handle errors.

The Insert method provides a slightly different (automatic) alternative for adding records.

Implementation: TryInsert tries to add the record. If it succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns the severity level of the error it encountered while trying to add the record. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')             !declare FileManager class
 MAP .                             !program map
GlobalErrors ErrorClass            !declare GlobalErrors object
Access:Client CLASS(FileManager)   !derive Access:Client object
              END
InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
              PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
              ENTRY(@s0),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
              PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
              ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
              BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
             END
 CODE
 !program code
 ACCEPT
  CASE FIELD()
  OF ?OK
   IF EVENT() = Event:Accepted                    !on OK button
    IF Access:Client.TryInsert() = Level:Benign   !add the new Client record
     POST(Event:CloseWindow)                      !if add succeeds, close down
    ELSE                                          !if add fails
     Access:Client.Throw(Msg:InsertFailed)        !handle the error
     Access:Client.CancelPrimeAutoInc             !restore the file
     CYCLE                                        !and start over
    END
   END
 !more code
```

See Also: Insert, PrimeRecord

TryNext (try to get next record in sequence)

TryNext, PROC

The **TryNext** method gets the next record in sequence. The TryNext method does not attempt to handle errors that occur while getting the next record.

The Next method provides a slightly different (automatic) alternative for getting records in sequence.

Implementation: TryNext tries to get the next record. If it succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns the severity level of the error it encountered while trying to get the record. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
PROGRAM  BatchReport                !batch process--don't display errors
 INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP                                !program map
 END

GlobalErrors ErrorClass             !declare GlobalErrors object
Access:Client CLASS(FileManager)    !derive Access:Client object
       END
 CODE
 !program code
 LOOP                                !loop through client file
  CASE Access:Cliet.TryNext()        !get next record in sequence
  OF Level:Notify OROF Level:Fatal   !if error occurred
   POST(Event:CloseWindow)           !shut down
   BREAK
  ELSE                               !otherwise
   PRINT(Rpt:Detail)                 !print the record
  END
 END
```

See Also: Next

TryOpen (try to open the file)

TryOpen, PROC

The **TryOpen** method tells the FileManager the calling procedure is using the file, then OPENs the file if it is not already open. The TryOpen method does not attempt to handle errors that occur while opening the file.

The Open method provides a slightly different (automatic) alternative for opening files.

Implementation: TryOpen tries to open the file. If it succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns the severity level of the error it encountered while trying to open the file. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
PROGRAM
 INCLUDE('ABFILE.INC')            !declare FileManager class
 MAP                              !program map
 END

GlobalErrors ErrorClass           !declare GlobalErrors object
Access:Client CLASS(FileManager)  !derive Access:Client object
Init          PROCEDURE           !prototype Access:File init
              END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
          END
 CODE
 GlobalErrors.Init                !initialize GlobalErrors object
 Access:Client.Init               !initialize Access:Client object
 IF Access:Client.TryOpen         !try to open the Client file
  MESSAGE('Could not open the Client file')   !handle the error yourself
  RETURN
 END

 !program code

 Access:Client.Close              !close the Client file
 Access:Client.Kill               !shut down the Access:Client object
 GlobalErrors.Kill                !shut down the GlobalErrors object
```

See Also: Open

TryPrevious (try to get previous record in sequence)

TryPrevious, PROC

The **TryPrevious** method gets the previous record in sequence. The TryPrevious method does not attempt to handle errors that occur while getting the previous record.

The Previous method provides a slightly different (automatic) alternative for getting records in sequence.

Implementation: TryPrevious tries to get the previous record. If it succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns the severity level of the error it encountered while trying to get the record. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
PROGRAM  BatchReport              !batch report--don't display errors
 INCLUDE('ABFILE.INC')            !declare FileManager class
 MAP                              !program map
 END

GlobalErrors ErrorClass           !declare GlobalErrors object
Access:Client CLASS(FileManager)  !derive Access:Client object
       END
 CODE
 !program code
 LOOP                              !loop through client file
  CASE Access:Client.TryPrevious() !get previous record in sequence
  OF Level:Notify OROF Level:Fatal !if error occurred
   POST(Event:CloseWindow)         !shut down
   BREAK
  ELSE                             !otherwise
   PRINT(Rpt:Detail)               !print the record
  END
 END
```

See Also: Previous

TryPrimeAutoInc (try to prepare an autoincremented record for adding)

TryPrimeAutoInc, VIRTUAL, PROC

When a record is Inserted, the **TryPrimeAutoInc** method prepares an autoincremented record for adding to the managed file. The TryPrimeAutoInc method does not handle any errors it encounters.

The PrimeAutoInc method provides a slightly different (automatic) alternative for preparing autoincremented records.

The CancelAutoInc method restores the managed file to its pre-TryPrimeAutoInc state.

Implementation: TryPrimeAutoInc tries to prime the record. If it succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns the severity level of the error it encountered while trying to prime the record. See *Error Class* for more information on severity levels.

Return Data Type: BYTE

Example:

```
 PROGRAM
 INCLUDE('ABFILE.INC')              !declare FileManager class
 MAP                                !program map
 END

GlobalErrors ErrorClass             !declare GlobalErrors object
Access:Client CLASS(FileManager)    !derive Access:Client object
Init      PROCEDURE                 !initialize Access:File object
PrimeAutoInc  PROCEDURE,VIRTUAL     !prepare new record for adding
       END

Client    FILE,DRIVER('TOPSPEED'),PRE(CLI),CREATE,BINDABLE,THREAD
IDKey      KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
ID          LONG
Name        STRING(20)
StateCode   STRING(2)
           END
          END

InsertWindow WINDOW('Add a new Client'),AT(,,159,73),IMM,SYSTEM,GRAY
        PROMPT('&Name:'),AT(8,20),USE(?CLI:Name:Prompt)
        ENTRY(@s20),AT(61,20,84,10),USE(CLI:Name),MSG('Client Name'),REQ
        PROMPT('State Code:'),AT(8,34),USE(?CLI:StateCode:Prompt)
```

```
        ENTRY(@s2),AT(61,34,40,10),USE(CLI:StateCode),MSG('State Code')
        BUTTON('OK'),AT(12,53,45,14),USE(?OK),DEFAULT
        BUTTON('Cancel'),AT(82,53,45,14),USE(?Cancel)
       END
 CODE
 GlobalErrors.Init                      !initialize GlobalErrors object
 Access:Client.Init                     !initialize Access:Client object
 Access:Client.Open                     !open the Client file
 IF Access:Client.TryPrimeAutoInc()     !prime Client record
  POST(Event:CloseWindow)               !if prime fails, close down
 END

 OPEN(InsertWindow)
 ACCEPT
  CASE FIELD()
  OF ?OK
   IF EVENT() = Event:Accepted          !on OK button
    IF Access:Client.Insert() = Level:Benign
    !finish adding the new Client record
     POST(Event:CloseWindow)            !if add succeeds, close down
    ELSE                                !if add fails
     SELECT(?CLI:Name:Prompt)           !select client name field
     CYCLE                              !and start over
    END
   END
  OF ?Cancel
   IF EVENT() = EVENT:Accepted          !on Cancel button
    Access:Client.CancelAutoInc         !restore Client to pre-PrimeRecord
    POST(Event:CloseWindow)             !close down
   END
  EMD
 END

 Access:Client.Close                    !close the Client file
 Access:Client.Kill                     !shut down the Access:Client object
 GlobalErrors.Kill                      !shut down the GlobalErrors object
 RETURN

Access:Client.PrimeAutoInc PROCEDURE
 CODE
 !your custom code here
 PARENT.PrimeAutoInc                    !call the base class method
 !your custom code here
```

See Also: CancelAutoInc, PrimeAutoInc

TryReget (try to get a specific record by position)

TryReget(*position* **), PROC**

TryReget	Gets a specific record by position.
position	A string constant, variable, EQUATE, or expression that indicates the position of the record to retrieve--typically the value returned by the Position method.

The **TryReget** method retrieves a specific record based its position and returns a success or failure indicator.

Implementation: The TryReget method tries to retrieve the specified record. If it succeeds, it returns Level:Benign; otherwise it returns the severity level of the last error encountered. See Error Class for more information on severity levels.

Return Data Type: BYTE

See Also: Position

TryUpdate (try to change the current record)

TryUpdate, PROC

The **TryUpdate** method changes (rewrites) the current record. The TryUpdate method does not attempt to handle errors that occur while changing the record.

The Update method provides a slightly different (auomatic) alternative for changing records.

Implementation: TryUpdate tries to change the record. If it succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns the severity level of the error it encountered while trying to change the record. See *Error Class* for more information on severity levels.

Note: This method does not handle referential integrity (RI) between related files. The RelationManager class enforces RI between related files.

Return Data Type: BYTE

See Also: Update

TryValidateField(validate field contents)

TryValidateField(*fieldid*), PROC, VIRTUAL

TryValidateField Validates the current record buffer value of the specified field and returns a success or failure indicator.

fieldid A numeric constant, variable, EQUATE, or expression that identifies the field to validate. The field is identified by its position in the FILE declaration. A value of one (1) indicates the first field, two (2) indicates the second field, etc.

The **TryValidateField** method initiates the validation of the field's buffer and requests that no errors be reported to the user. Level:Benign is returned if no errors occur.

Implementation: The TryValidateField method calls the ValidateFieldServer method to validate the field's contents.

Return Data Type: BYTE

See Also: FileManager.ValidateFieldServer, FileManager.ValidateField

Update (change the current record)

Update, PROC

The **Update** method changes (rewrites) the current record. The Update method handles any errors that occur while changing the record.

The TryUpdate method provides a slightly different (manual) alternative for changing records.

Implementation: If Update succeeds, it returns Level:Benign (declared in ABERROR.INC). If it ultimately fails, it returns the severity level of the last error it encountered while trying to change the record. See *Error Class* for more information on severity levels.

Note: This method does not handle referential integrity (RI) between related files. The RelationManager class enforces RI between related files.

Return Data Type: BYTE

See Also: TryUpdate

UseFile (use LazyOpen file)

UseFile, PROC

UseFile The **UseFile** method notifies ABC Library objects that the managed file whose opening was delayed by the LazyOpen property is about to be used. UseFile returns a value indicating whether the file is ready for use. A return value of Level:Benign indicates the file is ready; any other return value indicates a problem.

usetype A numeric constant, variable, EQUATE, or expression that determines how UseFile handles the file buffer.

A value of **UseType:Corrupts** changes the value in the file buffer but does not rely on the new value.

A value of **UseType:Uses** changes the value of the file buffer and then uses that value.

A value of **UseType:Returns** holds a value from the file buffer to return it to the parent. This mode is useful if you have a form record split between two windows and need to preserve the values from one to the next.

A value of **UseType:Benign** indicates that no special file buffer handling is requested.

Implementation:

UseFile return values are declared in ABERROR.INC. See Error Class for more information on these severity levels. The UseType EQUATEs are declared in ABFILE.INC as follows:

```
UseType  ITEMIZE(1),PRE
Corrupts EQUATE
Uses     EQUATE
Returns  EQUATE
Benign   EQUATE
         END
```

Return Data Type: BYTE

Example:

```
FileManager.TryFetch PROCEDURE(KEY Key)
CODE
  IF SELF.UseFile() THEN RETURN Level:Fatal. !really open the file
  GET(SELF.File,Key)
  IF ERRORCODE()
    RETURN Level:Notify
  ELSE
    RETURN Level:Benign
  END
```

See Also: LazyOpen

ValidateField (validate a field)

ValidateField(*field id* **), VIRTUAL, PROC**

ValidateField	Validates the current record buffer value of the specified field and returns a success or failure indicator.
field id	A numeric constant, variable, EQUATE, or expression that identifies the field to validate. The field is ientified by its position in the FILE declaration. A value of one (1) indicates the first field, two (2) indicates the second field, etc.

The **ValidateField** method initiates the validation of the field's buffer and requests that any errors be reported to the user. Level:Benign is returned if no errors occur.

Implementation: The ValidateField method calls the ValidateFieldServer method to validate the field's contents.

Return Data Type: BYTE

Example:

```
MyFile   FILE,DRIVER('TOPSPEED'),THREAD
Record    RECORD,PRE()
TGroup     GROUP                    !field id 1
Name        STRING(20)              !field id 2
Name2       STRING(20)              !field id 3
FirstName   STRING(10),OVER(Name2)  !field id 4
           END
Another    STRING(10)               !field id 5
          END
         END
 CODE
 !program code
 Access:MyFile.ValidateField(4)     !validate FirstName
```

See Also: ValidateFields, ValidateFieldServer

ValidateFields (validate a range of fields)

ValidateFields(*firstfield, lastfield* [,*failed*] **), VIRTUAL, PROTECTED, PROC**

ValidateField	Validates the specified range of fields in the current record buffer and returns a success or failure indicator.
firstfield	A numeric constant, variable, EQUATE, or expression that identifies the first field to validate by its position in the FILE declaration. A value of one (1) indicates the first field, two (2) indicates the second field, etc.
lastfield	A numeric constant, variable, EQUATE, or expression that identifies the last field to validate by its position in the FILE declaration. A value of one (1) indicates the first field, two (2) indicates the second field, etc.
failed	A signed numeric variable that receives the identifier of the field that failed the validation process. A value of one (1) indicates the first field, two (2) indicates the second field, etc. If omitted, the calling procedure gets no indication of which field failed the validation process.

The **ValidateField** method validates the specified range of fields in the current record buffer and returns a success or failure indicator, and otionally identifies the field that failed the validation process.

Implementation: The ValidateFields method invokes the ValidateField method for each field in the range *firstfield* to *lastfield*.

Return Data Type: BYTE

See Also: ValidateField

ValidateFieldServer(validate field contents)

ValidateFieldServer(*field id***,** *handle errors***), PROC, VIRTUAL, PROTECTED**

ValidateFieldServer
Validates the current record buffer value of the specified field and returns a success or failure indicator.

field id A numeric constant, variable, EQUATE, or expression that identifies the field to validate. The field is identified by its position in the FILE declaration. A value of one (1) indicates the first field, two (2) indicates the second field, etc.

handle errors An integer constant, variable, EQUATE, or expression that indicates an error has occurred when validating the field id.

The **ValidateFieldServer** method validates the specified field in the current record buffer and returns a success or failure indicator. If an error occurs when the field's buffer is validated an error message (Msg:FieldNotInFile) is indicated to the user.

Implementation: The ValidateFieldServer method simply returns a zero (0). By convention a return value of zero (0) indicates a valid field and any other value indicates a problem. The ABC Templates derive a file-specific ValidateFieldServer method for each file that implements Validity Checks specified in the Clarion data dictionary.

The ValidateField and TryValidateField methods both call ValidateFieldServer to do their work, any global editing functions added by deriving the FileManager Class should be placed in the ValidateFieldServer method to assure that they will be executed by both the Validate and TryValidate methods.

Return Data Type: BYTE

See Also: FileManager.TryValidateField, FileManager.ValidateField

ValidateRecord (validate all fields)

ValidateRecord([*failed*] **), VIRTUAL**

ValidateRecord

Validates all the fields in the current record buffer and returns a success or failure indicator.

failed A signed numeric variable that receives the identifier of the field that failed the validation process. A value of one (1) indicates the first field, two (2) indicates the second field, etc. If omitted, the calling procedure gets no indication of which field failed the validation process.

The **ValidateRecord** method validates all the fields in the current record buffer and returns a success or failure indicator, and optionally identifies the field that failed the validation process.

Implementation: The ValidateRecord method invokes the ValidateField method for each field in the record.

Return Data Type: BYTE

See Also: FileManager.ValidateField

FilterLocatorClass

FilterLocatorClass Overview

The FilterLocatorClass is an IncrementalLocatorClass that filters or limits the result set of the BrowseClass object's underlying view. That is, it not only locates matching items in the result set, but it limits the result set to only those items.

Use a Filter Locator when you want a multi-character search on alphanumeric keys and you want to *minimize network traffic*.

FilterLocatorClass Concepts

A Filter Locator is a multi-character locator, with no locator control required (but strongly recommended). The FilterLocatorClass lets you specify a locator control and a field on which to search for a BrowseClass object. The locator control accepts a search value which the FilterLocatorClass applies to the search field. The search can match the search value beginning with the first position of the search field ("begins with" search), or it can match the search value anywhere within the search field ("contains" search).

When the end user places one or more characters in the locator control, then *accepts* the control by pressing TAB, pressing a locator button, or selecting another control on the screen, the FilterLocatorClass creates a filter expression based on the input search value and applies the filter. Each additional (incremental) search character supplied results in a smaller, more refined result set. For example, a search value of 'A' returns all records from 'AA' to 'Az'; a search value of 'AB' returns all records from 'ABA' to 'ABz', and so on.

The Filter Locator determines the boundaries for the search based on the user specified search value. The implementation of the boundaries depends on the database--for SQL databases, the Filter Locator uses a LIKE; for ISAM databases it supplies upper and lower bounds.

Tip: The Filter Locator performs very well on SQL databases and on high order key component fields; however, performance may suffer if applied to non-key fields or low order key fields of non-SQL databases.

FilterLocatorClass Relationship to Other Application Builder Classes

The BrowseClass optionally uses the FilterLocatorClass. Therefore, if your BrowseClass objects use a FilterLocator, then your program must instantiate the FilterLocatorClass for each use. Once you register the FilterLocatorClass object with the BrowseClass object (see BrowseClass.AddLocator), the BrowseClass object uses the FilterLocatorClass object as needed, with no other code required. See the Conceptual Example.

FilterLocatorClass ABC Template Implementation

The ABC BrowseBox template generates code to instantiate the FilterLocatorClass for your BrowseBoxes. The FilterLocatorClass objects are called BRW*n*::Sort#:Locator, where *n* is the template instance number and # is the sort sequence (id) number. As this implies, you can have a different locator for each BrowseClass object sort order.

You can use the BrowseBox's **Locator Behavior** dialog (the **Locator Class** button) to derive from the EntryLocatorClass. The templates provide the derived class so you can modify the locator's behavior on an instance-by-instance basis.

FilterLocatorClass Source Files

The FilterLocatorClass source code is installed by default to the Clarion \LIBSRC folder. The specific FilterLocatorClass source code and its respective components are contained in:

ABBROWSE.INC	FilterLocatorClass declarations
ABBROWSE.CLW	FilterLocatorClass method definitions

FilterLocatorClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a BrowseClass object and related objects, including a Locator object. The example initializes and page-loads a LIST, then handles a number of associated events, including scrolling, updating, and locating records.

Note that the WindowManager and BrowseClass objects internally handle the normal events surrounding the locator.

```
   PROGRAM
   INCLUDE('ABWINDOW.INC')          !declare WindowManager class
   INCLUDE('ABBROWSE.INC')          !declare BrowseClass and Locator
   MAP
   END

State        FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey  KEY(ST:STATECODE),NOCASE,OPT
Record        RECORD,PRE()
STATECODE      STRING(2)
STATENAME      STRING(20)
              END
             END
StView    VIEW(State)              !declare VIEW to process
          END
StateQ    QUEUE                    !declare Q for LIST
ST:STATECODE  LIKE(ST:STATECODE)
```

```
ST:STATENAME  LIKE(ST:STATENAME)
ViewPosition  STRING(512)
          END

Access:State CLASS(FileManager)     !declare Access:State object
Init         PROCEDURE
             END
Relate:State CLASS(RelationManager) !declare Relate:State object
Init         PROCEDURE
             END
VCRRequest  LONG(0),THREAD

StWindow WINDOW('Browse States'),AT(,,123,152),IMM,SYSTEM,GRAY
      PROMPT('Find:'),AT(9,6)
      ENTRY(@s2),AT(29,4),USE(ST:STATECODE)
      LIST,AT(8,5,108,124),USE(?StList),IMM,HVSCROLL,FROM(StateQ),|
      FORMAT('27L(2)|M~CODE~@s2@80L(2)|M~STATENAME~@s20@')
     END

ThisWindow CLASS(WindowManager)       !declare ThisWindow object
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END
BrowseSt   CLASS(BrowseClass)         !declare BrowseSt object
Q          &StateQ
           END

StLocator  FilterLocatorClass         !declare StLocator object
StStep   StepStringClass              !declare StStep object

 CODE
 ThisWindow.Run()                     !run the window procedure

ThisWindow.Init  PROCEDURE()          !initialize things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()          !call base class init
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Init                    !initialize Relate:State object
 SELF.FirstField = ?ST:STATECODE      !set FirstField for ThisWindow
 SELF.VCRRequest &= VCRRequest        !VCRRequest not used
 Relate:State.Open                    !open State and related files
 !Init BrowseSt object by naming its LIST,VIEW,Q,RelationManager & WindowManager
 BrowseSt.Init(?StList,StateQ.ViewPosition,StView,StateQ,Relate:State,SELF)
 OPEN(StWindow)
 SELF.Opened=True
 BrowseSt.Q &= StateQ                 !reference the browse QUEUE
 StStep.Init(+ScrollSort:AllowAlpha,ScrollBy:Runtime)  !initialize the StStep object
```

```
 BrowseSt.AddSortOrder(StStep,ST:StateCodeKey)         !set the browse sort order
 BrowseSt.AddLocator(StLocator)                        !plug in the browse locator
 StLocator.Init(?ST:STATECODE,ST:STATECODE,1,BrowseSt) !initialize the locator object
 BrowseSt.AddField(ST:STATECODE,BrowseSt.Q.ST:STATECODE)    !set a column to browse
 BrowseSt.AddField(ST:STATENAME,BrowseSt.Q.ST:STATENAME)    !set a column to browse
 SELF.SetAlerts()                                      !alert any keys for ThisWindow
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()          !shut down things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()          !call base class shut down
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Close                   !close State and related files
 Relate:State.Kill                    !shut down Relate:State object
 GlobalErrors.Kill                    !shut down GlobalErrors object
 RETURN ReturnValue
```

FilterLocatorClass Properties

FilterLocatorClass Properties

The FilterLocatorClass inherits all the properties of the IncrementalLocatorClass from which it is derived. See *IncrementalLocatorClass Properties* and *LocatorClass Concepts* for more information.

In addition to the inherited properties, the FilterLocatorClass also contains the following property:

FloatRight ("contains" or "begins with" flag)

FloatRight BYTE

The **FloatRight** property determines whether the FilterLocator applies the search value to the entire field (field *contains* search value) or only to the leftmost field positions (field *begins with* search value). A value of one (1 or True) applies the "contains" test; a value of zero (0 or False) applies the "begins with" test.

The FilterLocatorClass does not initialize the FloatRight property, therefore FloatRight defaults to zero.

Implementation: The UpdateWindow method implements the action specified by the FloatRight property.

Example: A FilterLocator searching for "ba" returns:

FloatRight=False	**FloatRight=True**
Bain	Bain
Barber	Barber
Bayert	Bayert
	Dunbar
	Suba

See Also: UpdateWindow

FilterLocatorClass Methods

FilterLocatorClass Methods

The FilterLocatorClass inherits all the methods of the IncrementalLocatorClass from which it is derived. See *IncrementalLocatorClass Methods* and *LocatorClass Concepts* for more information.

TakeAccepted (process an accepted locator value:FilterLocatorClass)

TakeAccepted, VIRTUAL

The **TakeAccepted** method processes the accepted locator value and returns a value indicating whether the BrowseClass list display should be updated. A return value of one (1 or True) indicates the list should be refreshed; a return value of zero (0 of False) indicates no refresh is needed.

This method is only appropriate for LocatorClass objects with locator controls that accept user input; for example, entry controls, combo controls, or spin controls.

A locator value is accepted when the end user changes the locator value, then TABS off the locator control or otherwise switches focus to another control on the same window.

Implementation: The TakeAccepted method primes the FreeElement property with the appropriate search value. If there is a search value, TakeAccepted calls the UpdateWindow method to apply the search value.

Return Data Type: BYTE

Example:

```
BrowseClass.TakeAcceptedLocator PROCEDURE !process an accepted locator entry
 CODE
 IF ~SELF.Sort.Locator &= NULL AND ACCEPTED() = SELF.Sort.Locator.Control
  IF SELF.Sort.Locator.TakeAccepted() !call locator take accepted method
   SELF.Reset(1)              !if search needed, reset the view
   SELECT(SELF.ListControl)       !focus on the browse list control
   SELF.ResetQueue( Reset:Done )    !reload the browse queue
   IF ~SELF.Sort.Locator &= NULL    !if locator is present
    SELF.Sort.Locator.Reset       ! match search value to actual record
   END
  END
 END
```

See Also: FreeElement

UpdateWindow (apply the search criteria)

UpdateWindow, VIRTUAL

The **UpdateWindow** method applies the search criteria and redraws the locator control with its current value.

Implementation: The UpdateWindow method refilters the underlying view, primes the FreeElement property with the current search value (the Shadow property), then redraws the locator control.

Example:

```
MyBrowseClass.UpdateWindow PROCEDURE      !update browse related controls
 CODE
 IF ~(SELF.Sort.Locator &= NULL)          !if locator is present
  SELF.Sort.Locator.UpdateWindow          ! redraw locator control
 END
```

FuzzyClass

FuzzyClass Overview

The FuzzyClass supports the BrowseFuzzyMatching control template. These classes provide the searching and weighting algorithms.

FuzzyMatching provides a way to search for a value and get all records that have that value somewhere in the record's columns. The data returned is weighted based on where in the record the value exists.

Lets see this in an example. Using a database of Books, we might have some fields such as Title, Author, and ISBN. If we choose to search for the value of 'Potter', we will get all records which have 'Potter' in the Title (Harry Potter and the Goblet of Fire) or in the Author (Beatrix Potter).

Relationship to Other Application Builder Classes

The FuzzyClass is completely independent of other Application Builder Classes.

FuzzyClass ABC Template Implementation

The FuzzyClass is instantiated globally in any application that has the global 'Enable Fuzzy Matching' box turned on. The global settings also have two options, Ignore Case and Word Only that can optionally be set for Fuzzy Matching.

To use FuzzyMatching within a procedure, add the control template to the window. This will add a GROUP control that contains an ENTRY control and 2 BUTTON controls.

FuzzyClass Source Files

The FuzzyClass source code is installed by default to the Clarion \LIBSRC folder. The specific FuzzyClass source code and its respective components are contained in:

ABFUZZY.INC	FuzzyClass declarations
ABFUZZY.CLW	FuzzyClass method definitions

FuzzyClass Properties

The FuzzyClass contains no public properties.

FuzzyClass Methods

Construct (initialize FuzzyClass object)

Construct

The **Construct** method performs the necessary code to initialize the FuzzyClass object.

Implementation: The Construct method is automatically called when the object is instantiated.

Init (initialize FuzzyClass object)

Init

The **Init** method performs the necessary code to initialize the FuzzyClass object and its default settings.

Implementation: The Init method is called globally in the start of an application.

Kill (shutdown FuzzyClass object)

Kill

The **Kill** method performs the necessary code to initialize the FuzzyClass object and its default settings.

Implementation: The Kill method is called globally at the end of the application.

Match (find query matches)

Match(*document***,** *query***)**

Match	Finds matching records based on the query.
document	A string constant, variable, EQUATE or expression that is compared against when matching records.
query	A string constant, variable, EQUATE, or expression that contains the value to search on.

The **Match** method returns a value based on where an instance of the query is found within the *document*.

Return Data Type: BYTE

SetOption (set fuzzymatch options)

SetOption(*whichoption***,** *value***)**

SetOption	Set the Ignore Case and Word Only options.
whichoption	An integer constant, variable, EQUATE, or expression that specifies which option to set. The equates for these options are located in ABFUZZY.INC. MatchOption:NoCase sets the Ignore Case option. MatchOption:WordOnly sets the Word Only option.
value	An integer constant, variable, EQUATE, or expression that specifies the value for the option. A value of one (1 or True) will set the option on; a value of zero (0 or False) will turn the option off. The default value is True.

The **SetOption** method logically sets one of the two options available for FuzzyMatching. These are *Ignore Case* and *Word Only*. When *Ignore Case* is set the query is case insensitive. *Word Only* finds the query value only if it is a separate word (denoted by a space directly before and directly after the text.

Return Data Type: BYTE

Example:

```
FuzzyMatcher.SetOption(MatchOption:NoCase, 1)        !set for case insensitive search
FuzzyMatcher.SetOption(MatchOption:WordOnly, 0)      !turn off word only search
```

FormVCRClass

FormVCRClass Overview

The FormVCRClass is a special class that uses a group control populated with scrolling and update buttons. It is designed as an accessory to a Form procedure that is designed to function independently from a standard Browse procedure.

Use the FormVCRClass template when you want to call a form directly from a menu item or button and use the FormVCRClass to navigate through a primary file and perform standard update actions.

FormVCRClass Concepts

The FormVCRClass lets you specify a group control with navigation and standard update buttons.

As the form is first opened, internal properties are set that control what buttons are disabled and what database operations are allowed.

FormVCRClass Relationship to Other Application Builder Classes

The FormVCRClass is closely integrated with several other ABC Library objects--in particular the WindowManager and ToolbarClass objects. These objects register their presence with each other, set each other's properties, and call each other's methods as needed to accomplish their respective tasks.

The FormVCRClass is derived from the ViewManager, plus it relies on many of the other Application Builder Classes (RelationManager, ToolbarClass, etc.) to accomplish its tasks. Therefore, if your program instantiates the FormVCRClass, it must also instantiate these other classes. Much of this is automatic when you INCLUDE the FormVCRClass header (ABVCRFRM.INC) in your program's data section.

FormVCRClass ABC Template Implementation

The ABC Templates declare a local FormVCR class *and* object for each instance of the FormVCRControl template. The ABC Templates automatically include all the classes necessary to support the functionality specified in the FormVCRControl template.

The FormVCR Control Template requires the use of the SaveButton Control Template, which is the framework of the Form template.

FormVCRClass Source Files

The FormVCRClass source code is installed by default to the Clarion \LIBSRC folder. The specific FormVCRClass source code and their respective components are contained in:

ABVCRFRM.INC	FormVCRClass declarations
ABVCRFRM.CLW	FormVCRClass method definitions

FormVCRClass Properties

QuickScan (buffered reads flag)

QuickScan BYTE

The **QuickScan** property contains a value that tells the FormVCRClass whether or not to quickscan when paging up or down within the form. Quick scanning only affects file systems that use multi-record buffers. See *Database Drivers* for more information.

A value of zero (0) disables quick scanning; a non-zero value enables quick scanning. Quick scanning is the normal way to read records for browsing. However, rereading the buffer may provide slightly improved data integrity in some multi-user circumstances at the cost of substantially slower reads.

Implementation: The **QuickScan** property sets SetQuickScan method, which SENDs the QUICKSCAN driver string to the file driver for each specified file. The QUICKSCAN driver string is supported by the ASCII, BASIC, and DOS drivers.

Toolbar (FormVCR Toolbar object)

Toolbar &ToolbarClass

The **Toolbar** property is a reference to the ToolbarClass for this FormVCRClass object. The ToolbarClass object collects toolbar events and passes them on to the active ToolbarTarget object for processing.

The AddToolbarTarget method registers a ToolbarTarget, such as a ToolbarListBoxClass object, as a potential target of a ToolbarClass object.

The ToolbarClass.SetTarget method sets the active target for a ToolbarClass object.

Implementation: The ToolbarClass object for FormVCR controls is the object that detects toolbar events, such as scroll down or page down, and passes them on to the *active* ToolbarListBoxClass (ToolbarTarget) object. In the standard template implementation, there is a single global toolbar, and a ToolbarClass object per procedure that may drive several different browses and forms, each of which is a ToolbarTarget. Only one ToolbarTarget is active at a time.

ToolbarItem (FormVCR ToolbarTarget object)

ToolbarItem &ToolbarListBoxClass

The **ToolbarItem** property is a reference to the ToolbarListBoxClass for this FormVCRClass object. The ToolbarListBoxClass (ToolbarTarget) object receives toolbar events (from a ToolbarClass object) and processes them.

The AddToolbarTarget method registers a ToolbarTarget, such as a ToolbarListBoxClass object, as a potential target of a ToolbarClass object.

The ToolbarClass.SetTarget method sets the active target for a ToolbarClass object.

Implementation: The ToolbarClass object for the Form VCR controls is the object that detects toolbar events, such as scroll down or page down, and passes them on to the *active* ToolbarListBoxClass (ToolbarTarget) object. In the standard template implementation, there is a single global toolbar, and a ToolbarClass object per procedure that may drive several different browses and forms, each of which is a ToolbarTarget. Only one ToolbarTarget is active at a time.

See Also: Toolbar, AddToolbarTarget, ToolbarClass.SetTarget

ViewPosition (store the current record position)

ViewPosition STRING(1024)

The **ViewPosition** property stores the unique position of the current record.

Implementation: Position returns the POSITION of the primary key if there is one; otherwise it returns the file POSITION. See the *Language Reference* for more information on POSITION.

Example:

```
FormVCRClass.TakeEvent          PROCEDURE
VSP BYTE,AUTO
 CODE
    SELF.Window.Update()
    IF EVENT()=EVENT:Accepted THEN
       CASE ACCEPTED()
           OF SELF.Window.OkControl
       OROF SELF.Window.SaveControl
           SELF.ViewPosition=POSITION(SELF.View)
                  SELF.SaveRequired = True
                  IF SELF.OnFirstRecord THEN
              SELF.MoveDirection = Event:ScrollDown
           END
       ELSE
          IF NOT 0{PROP:AcceptAll} THEN
             SELF.TakeAcceptedLocator()
          END
       END
```

FormVCRClass Methods:

AddToolbarTarget (set the FormVCR toolbar)

AddToolbarTarget(*toolbar* **)**

AddToolbarTarget	Registers the FormVCR object as a potential target of the specified *toolbar*.
toolbar	The label of the ToolbarClass object that directs toolbar events to this FormVCRClass object.

The **AddToolbarTarget** method registers the FormVCRClass object as a potential target of the specified *toolbar*. The ToolbarClass.SetTarget method sets the active target for a ToolbarClass object.

Implementation: The Toolbar object for a FormVCR is the object that detects toolbar events, such as scroll down or page down, and passes them on to the *active* ToolbarTarget object. In the standard template implementation, there is a single global toolbar, and a Toolbar object per procedure that may drive several different browses and forms, each of which is a ToolbarTarget. Only one ToolbarTarget is active at a time.

Example:

```
  OPEN(QuickWindow)                                        ! Open window
  SELF.Opened=True
  FormVCR6.Init|
  (?FormVCRControls,10,FormVCR6::View,Relate:people,SELF) ! Init FormVCR manager
  FormVCR6.InsertWhenNoRecords = True
  FormVCR6.SetVCRControls|
 (?FormVCR:Top,?FormVCR:PageUp,?FormVCR:Up,?FormVCR:Down,?FormVCR:PageDown,|
 ?FormVCR:Bottom)
  FormVCR6.SetRequestControl|
 (?FormVCR:Request,?FormVCR:Request:View,?FormVCR:Request:Insert,?FormVCR:Request:Change,|
 ?FormVCR:Request:Delete)
  Do DefineListboxStyle
  FormVCR6.AddSortOrder()                          !Add the sort order for sort order 1
! Controls like list boxes will resize, whilst controls like buttons will move
  Resizer.Init(AppStrategy:Surface,Resize:SetMinSize)
  SELF.AddItem(Resizer)                            ! Add resizer to window manager
  SELF.AddItem(ToolbarForm)
  FormVCR6.AddToolbarTarget(Toolbar)               ! Browse accepts toolbar control
  FormVCR6.Reset
  SELF.SetAlerts()
  RETURN ReturnValue
```

See Also: Toolbar, ToolbarItem, ToolbarClass.SetTarget

Init (initialize the FormVCR object)

Init (*listcontrol*, *pagesize*, *view* , *relationmanager*, *windowmanager*)

Init	Initializes the FormVCR object.
listcontrol	A numeric constant, variable, EQUATE, or expression containing the control number of the FormVCR GROUP control.
pagesize	A numeric constant, variable, EQUATE, or expression containing the number of records to page in the FormVCR object.
view	The label of the FormVCR's underlying VIEW.
relationmanager	The label of the FormVCR primary file RelationManager object. See *Relation Manager* for more information.
windowmanager	The label of the FormVCR WindowManager object. See *Window Manager* for more information.

The **Init** method initializes the FormVCR object.

Implementation: In addition to other things (like initialization of properties), the Init method calls the PARENT.Init method to initialize the FormVCR ViewManager object.

Example:

```
  OPEN(QuickWindow)                                  ! Open window
        SELF.Opened=True
! Initialize the FormVCR manager

  FormVCR6.Init(?FormVCRControls,10,FormVCR6::View,Relate:people,SELF)
```

InitSort (initialize locator values)

InitSort (*neworder***), VIRTUAL**

The **InitSort** method initializes locator values when a new sort order is applied to a browse list.

See Also: SetSort

Kill (shut down the FormVCR object)

Kill, VIRTUAL

The **Kill** method shuts down the FormVCR object.

Implementation: Among other things, the ForVCR.Kill method calls the PARENT.Kill (ViewManager.Kill) method to shut down the browse's ViewManager object. See *View Manager* for more information.

CheckBorders (check for existence of records)

CheckBorders( ), VIRTUAL

CheckBorders Checks for the existence of records.

The **CheckBorders** method is a virtual method used to check for the existence of records after the FormVCR class has completed an update.

Implementation: The CheckBorders method is called from the UpdateWindow, ResetSort, TakeRequestChanged methods, and set a number of private properties used to control the display state of the FormVCR controls.

Example:

```
FormVCRClass.UpdateWindow PROCEDURE
  CODE
    IF ~(SELF.Sort.Locator &= NULL)
      SELF.Sort.Locator.UpdateWindow
    END
    SELF.CheckBorders
    SELF.UpdateButtons
    IF ~SELF.Toolbar &= NULL
      SELF.Toolbar.DisplayButtons
    END
```

GetAction (return FormVCR action)

GetAction( ), BYTE, VIRTUAL

GetAction Detect that an action has taken place.

The **GetAction** method is a virtual method used by the ToolBarClass to detect and process actions posted by the FormVCR class.

Implementation: The GetAction method is called from the ToolbarFormVCRClass to detect an actionand enable/disable buttons where appropriate.

Example:

```
ToolbarFormVCRClass.DisplayButtons PROCEDURE
  CODE
    IF SELF.FormVCR.GetAction()=InsertRecord THEN
       ENABLE(Toolbar:History)
    ELSE
       DISABLE(Toolbar:History)
    END
    Toolbar:Bottom{PROP:DISABLE}    =|
CHOOSE(SELF.FormVCR.GetActionAllowed(EVENT:ScrollBottom,0),False,True)
    Toolbar:Top{PROP:DISABLE}       =|
CHOOSE(SELF.FormVCR.GetActionAllowed(EVENT:ScrollTop,0),False,True)
    Toolbar:PageDown{PROP:DISABLE}  =|
CHOOSE(SELF.FormVCR.GetActionAllowed(EVENT:PageDown,0),False,True)
    Toolbar:PageUp{PROP:DISABLE}    =|
CHOOSE(SELF.FormVCR.GetActionAllowed(EVENT:PageUp,0),False,True)
    Toolbar:Down{PROP:DISABLE}      =|
CHOOSE(SELF.FormVCR.GetActionAllowed(EVENT:ScrollDown,0),False,True)
    Toolbar:Up{PROP:DISABLE}        =|
CHOOSE(SELF.FormVCR.GetActionAllowed(EVENT:ScrollUp,0),False,True)

    DISABLE(Toolbar:Locate)
    PARENT.DisplayButtons
```

GetActionAllowed (validate a requested FormVCR action)

GetActionAllowed(*event, action* **), VIRTUAL**

GetActionAllowed Checks for a valid FormVCR action.

The **GetActionAllowed** method is a virtual method used to validate a FormVCR action.

Implementation: The GetActionAllowed method is called by the TakeEvent method and is used to synchronize toolbar buttons with the appropriate FormVCR action..

Example:

```
CASE ACCEPTED()
OF SELF.VCRRequest
 IF SELF.GetActionAllowed(EVENT:Accepted,SELF.Window.Request) THEN
  CHANGE(SELF.VCRRequest,SELF.Window.Request)
  SELF.Window.OriginalRequest = SELF.Window.Request
  SELF.TakeRequestChanged(SELF.VCRPrevRequest,SELF.Window.Request)
  SELF.VCRPrevRequest = SELF.Window.Request
 ELSE
  IF SELF.NoRecords THEN
   SELF.NoRecords = RECORDS(SELF.View)
   IF NOT SELF.GetActionAllowed(EVENT:Accepted,SELF.Window.Request) THEN
    SELF.Window.Request = SELF.VCRPrevRequest
    CHANGE(SELF.VCRRequest,SELF.Window.Request)
    SELF.UpdateWindow
   ELSE
    CHANGE(SELF.VCRRequest,SELF.Window.Request)
    SELF.Window.OriginalRequest = SELF.Window.Request
    SELF.TakeRequestChanged(SELF.VCRPrevRequest,SELF.Window.Request)
    SELF.VCRPrevRequest = SELF.Window.Request
   END
  END
 END
END
```

Next (get the next FormVCR item)

Next( ), BYTE, VIRTUAL

The **Next** method gets the next record from the FormVCR view and returns a value indicating its success or failure.

Next returns Level:Benign if successful, Level:Notify if it reached the end of the file, and Level:Fatal if it encountered a fatal error.

Implementation: Corresponding return value EQUATEs are declared in ABERROR.INC. See *Error Class* for more information on these severity level EQUATEs.

```
Level:Benign                EQUATE(0)
Level:User                  EQUATE(1)
Level:Program               EQUATE(2)
Level:Fatal                 EQUATE(3)
Level:Cancel                EQUATE(4)
Level:Notify                EQUATE(5)
```

The Next method is called by the Fetch method. Among other things, Next calls the PARENT.Next (ViewManager.Next) method. See *ViewManager* for more information.

Return Data Type: BYTE

Example:

Previous (get the previous FormVCR item)

Previous, VIRTUAL

The **Previous** method gets the previous record from the FormVCR view and returns a value indicating its success or failure.

Implementation: Returns Level:Benign if successful, Level:Notify if it reached the end of the file, and Level:Fatal if it encountered a fatal error. Corresponding severity level EQUATEs are declared in ABERROR.INC. See *Error Class* for more information on error severity levels.

```
Level:Benign                EQUATE(0)
Level:User                  EQUATE(1)
Level:Program               EQUATE(2)
Level:Fatal                 EQUATE(3)
Level:Cancel                EQUATE(4)
Level:Notify                EQUATE(5)
```

The Previous method is called by the Fetch method. Among other things, Previous calls the PARENT.Previous (ViewManager.Previous) method. See *ViewManager* for more information.

Return Data Type: BYTE

ResetSort (apply sort order to FormVCR)

ResetSort(*force* **), VIRTUAL, PROC**

ResetSort	Reapplies the active sort order to the FormVCR controls.
force	A numeric constant, variable, EQUATE, or expression that indicates whether to reset the FormVCR object conditionally or unconditionally. A value of one (1 or True) unconditionally resets the FormVCR; a value of zero (0 or False) only resets the FormVCR as circumstances require (sort order changed, reset fields changed, first loading, etc.).

The **ResetSort** method reapplies the active sort order to the FormVCR object and returns one (1) if the sort order changed; it returns zero (0) if the order did not change. Any range limits, locators, or reset fields associated with the sort order are enabled.

Implementation: The ResetSort method calls the SetSort method to apply the current sort order.

Return Data Type: BYTE

SetAlerts (alert keystrokes for FormVCR controls)

SetAlerts, VIRTUAL

The **SetAlerts** method alerts standard keystrokes for the FormVCR controls.

The FormVCR.TakeEvent method processes the alerted keystrokes.

Implementation: The BrowseClass.SetAlerts method alerts the INSERT, DELETE and CTRL+ENTER keys for the browse's list control and calls the LocatorClass.SetAlerts method for each associated locator control. Corresponding keycode EQUATEs are declared in KEYCODES.CLW.

SetRequestControl (assign field equates to FormVCR actions)

SetRequestControl
(pVCRRequest, pVCRViewRecord, pVCRInsertRecord, pVCRChangeRecord, pVCRDeleteRecord)

The **SetRequestControl** method assigns the related field equate of a control to a particular FormVCR function. Each parameter specified is a SIGNED integer.

Implementation:
The SetRequestControl method is used to map an appropriate control to a particular database action. If the parameter is not set by the SetRequestControl method, than the action is not supported.

Example:

```
OPEN(QuickWindow)                                    ! Open window
  SELF.Opened=True
! Initialize the FormVCR manager
  FormVCR6.Init(?FormVCRControls,10,FormVCR6::View,Relate:people,SELF)
  FormVCR6.InsertWhenNoRecords = True
  FormVCR6.SetVCRControls|
  (?FormVCR:Top,?FormVCR:PageUp,?FormVCR:Up,?FormVCR:Down,|
   ?FormVCR:PageDown,?FormVCR:Bottom)
   FormVCR6.SetRequestControl|
  (?FormVCR:Request,?FormVCR:Request:View,?FormVCR:Request:Insert,|
  ?FormVCR:Request:Change,?FormVCR:Request:Delete)
```

SetVCRControls (assign field equates to FormVCR scrolling)

SetVCRControls
(*pVCRTop, pVCRUp, pVCRPageUp, pVCRPageDown, pVCRDown, pVCRBottom, pVCRNewRecord=0*)

The **SetVCRControls** method assigns the related field equate of a control to a particular FormVCR scrolling function. Each parameter specified is a SIGNED integer.

Implementation:
The SetVCRControls method is used to map an appropriate control to a particular scrolling action. If the parameter is not set by the SetVCRControls method, than the action is not supported.

Example:

```
OPEN(QuickWindow)                                    ! Open window
  SELF.Opened=True
! Initialize the FormVCR manager
  FormVCR6.Init(?FormVCRControls,10,FormVCR6::View,Relate:people,SELF)
  FormVCR6.InsertWhenNoRecords = True
  FormVCR6.SetVCRControls|
  (?FormVCR:Top,?FormVCR:PageUp,?FormVCR:Up,?FormVCR:Down,|
   ?FormVCR:PageDown,?FormVCR:Bottom)
   FormVCR6.SetRequestControl|
  (?FormVCR:Request,?FormVCR:Request:View,?FormVCR:Request:Insert,|
   ?FormVCR:Request:Change,?FormVCR:Request:Delete)
```

SetSort (apply a sort order to the FormVCR group)

SetSort(*order*, *force reset* **), VIRTUAL, PROC**

SetSort	Applies a specified sort order to the FormVCR group.
order	An integer constant, variable, EQUATE, or expression that specifies the sort order to apply.
force reset	A numeric constant, variable, EQUATE, or expression that tells the method whether to reset the FormVCR conditionally or unconditionally. A value of zero (0 or False) resets the FormVCR only if circumstances require (sort order changed, reset fields changed, first time loading); a value of one (1 or True) unconditionally resets the FormVCR.

The **SetSort** method applies the specified sort *order* to the FormVCR group and returns one (1) if the sort order changed; it returns zero (0) if the sort order did not change. Any range limits, locators, and reset fields associated with the sort order are enabled and applied.

The *order* value is typically a value returned by the ViewManager's AddSortOrder method which identifies the particular sort order. Since AddSortOrder returns sequence numbers, a value of one (1) applies the sort order specified by the first call to AddSortOrder; two (2) applies the sort order specified by the next call to AddSortOrder; etc. A value of zero (0) applies the default sort order.

Implementation: The ResetSort method calls the SetSort method.

Return Data Type: BYTE

TakeAcceptedLocator (apply an accepted FormVCR locator value)

TakeAcceptedLocator, VIRTUAL

The **TakeAcceptedLocator** method applies an accepted locator value to the FormVCR group--the FormVCR object loads the requested item.

Locators with entry controls are the only locators whose values are accepted. Other types of locators are invoked in other ways, for example, with alerted keys. Locator values are accepted when the end user TABS off or otherwise switches focus away from the locator's entry control.

The AddLocator method establishes locators for the browse.

Implementation: The TakeAcceptedLocator method calls the appropriate LocatorClass.TakeAccepted method.

TakeEvent (process the current ACCEPT loop event)

TakeEvent, VIRTUAL

The **TakeEvent** method processes the current ACCEPT loop event for the FormVCR object. The TakeEvent method handles all events associated with the FormVCR group.

Implementation: The WindowManager.TakeEvent method calls the TakeEvent method. The TakeEvent method calls the TakeScroll or TakeKey method as appropriate.

TakeLocate (a FormVCR virtual to process each sort)

TakeLocate, VIRTUAL

The **TakeLocate** method is a virtual method that sets the active sort and filter criteria, and enables any necessary toolbar activity.

Implementation: The FormVCR.TakeEvent method calls the TakeLocate method for each Locate event.

TakeScroll (process a FormVCR scroll event)

TakeScroll([*scrollevent*] **), VIRTUAL**

TakeScroll Processes a scroll event for the FormVCR group.

scrollevent An integer constant, variable, EQUATE, or expression that specifies the scroll event. Valid scroll events are back one item, forward one item, forward one page, back one page, back to the first item, and ahead to the last item. If omitted, no scrolling occurs.

The **TakeScroll** method processes a scroll event for the FormVCR group.

Implementation: A *scrollevent* value of EVENT:ScrollUp scrolls back one item; EVENT:ScrollDown scrolls ahead one item; EVENT:PageUp scrolls ahead one page; EVENT:PageDown scrolls back one page; EVENT:ScrollTop scrolls to the first item; EVENT:ScrollBottom scrolls to the last item. Corresponding *scrollevent* EQUATEs are declared in EQUATES.CLW.

```
EVENT:ScrollUp      EQUATE (03H)
EVENT:ScrollDown    EQUATE (04H)
EVENT:PageUp        EQUATE (05H)
EVENT:PageDown      EQUATE (06H)
EVENT:ScrollTop     EQUATE (07H)
EVENT:ScrollBottom  EQUATE (08H)
```

The TakeScroll method calls the ScrollEnd, ScrollOne, or ScrollPage method as needed.

UpdateWindow (update display variables to match FormVCR action)

UpdateWindow, VIRTUAL

The **UpdateWindow** method updates display variables to match the current state of the FormVCR group.

Implementation: The FormVCRClass.UpdateWindow method calls the appropriate LocatorClass.UpdateWindow method, which ensures the locator field contains the current search value.

GraphClass

GraphClass Overview

The GraphClass is used to manage and control the SVgraph group control available on windows and reports. This control is created and initialize by the SVGraph control template. At runtime, the group control reads from initial settings of the GraphClass, and arranges the data points into a default graph type format. The data included in this graph includes grouping of data, legends, labels, popup menus, and default print capabilities.

The SVGraph template is most useful for displaying graphical representation of data for nearly every type of business application.

Relationship to Other Application Builder Classes

The GraphClass is derived from the GraphAxisClass . It also is affected by a number of other Graph Classes.

The GraphClass is the only class that will be visible to the developer. All other classes are used internally by the Graph Class and are not documented.

GraphClass ABC Template Implementation

The SVGraph template generates code to instantiate the GraphClass for your graph control. The GraphClass objects are called, by default, "GRP*n*", where *n* is the template instance number. Multiple graph controls may be used in a single procedure.

GraphClass Source Files

The GraphClass source code is installed by default to the Clarion \LIBSRC folder. The specific GraphClass source code and its respective components are contained in:

SVGRAPH.INC	GraphClass declarations
SVGRAPH.CLW	GraphClass method definitions
SVGRAPH.EQU	Graph Property Equates and Events

GraphClass Properties

eShowSBonFirstThread (display on base status bar)

eShowSBonFirstThread BOOL

eShowSBonFirstThread is a Boolean value that determines if status bar information from the graph object needs to be redirected to the application's first thread.

If the current WINDOW that populated the graph control does not have a Status bar attribute, then **eShowSBonFirstThread** set to TRUE will show graph control information in the status bar of the APPLICATION (first thread). Set this property to FALSE to suppress (hide) this information.

See Also: ShowOnStatusBar

eSumYMax (calculated maximum node value)

eSumYMax REAL

eSumYMax is a property that is used to calculate the maximum sum of node values for the accumulation graph types (Bar and Column). This property is used for drawing the diagram (e.g., It is necessary for calculating the height of the highest column).

See Also: CalcGraph

gShowDiagramName (show diagram name on target)

gShowDiagramName LIKE(gShowToType)

gShowDiagramName is used to determine where the diagram name information will be displayed in the graph control. Diagram name (series name) is the label of each set of data points that you have defined for the graph control, with an added ‘Diagram:’ prompt.

gShowDiagramName uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object’s ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also: DiagramText, ShowOnField

gShowDiagramNameV (show diagram value on target)

gShowDiagramNameV LIKE(gShowToType)

gShowDiagramNameV is used to determine where the diagram name text information will be displayed in the graph control. Diagram name text (series name) is the label of each set of data points that you have defined for the graph control, without an added ‘Diagram:’ prompt.

gShowDiagramNameV uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object’s ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
DiagramNameText, ShowOnField

gShowMouse (show mouse coordinates on target)

gShowMouse LIKE(gShowToType)

gShowMouse is used to determine where mouse X and Y coordinates will be displayed in the graph control.

gShowMouse uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object's ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
ToShowValues, ToolTip

gShowMouseX (show mouse X coordinate on target)

gShowMouseX LIKE(gShowToType)

gShowMouseX is used to determine where mouse X coordinate information will be displayed in the graph control.

gShowMouseX uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object's ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
ToShowValues, ToolTip

gShowMouseY (show mouse Y coordinate on target)

gShowMouseY LIKE(gShowToType)

gShowMouseY is used to determine where mouse Y coordinate information will be displayed in the graph control.

gShowMouseY uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object's ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
ToShowValues, ToolTip

gShowNodeName (show node name on target)

gShowNodeName **LIKE(gShowToType)**

gShowNodeName is used to determine if and where the node name information will be displayed in the graph control. Node name is the full text of the active X and Y Node name, less the "Node:" prompt and values. The text is formed by the NodeText method. Node Text is returned as the full form as follows:

"Node: **name** (X, Y)"

gShowNodeName determines if and where the *name* part of the above node text will be displayed.

gShowNodeName uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object's ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
NodeText

gShowNodeNameV (show node name value on target)

gShowNodeNameV LIKE(gShowToType)

gShowNodeNameV is used to determine where the node name value information will be displayed in the graph control. Node name value is the actual node *Name* identifier.

gShowNodeNameV uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object's ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
NodeNameText

gShowNodeValue (show node axis values on target)

gShowNodeValue **LIKE(gShowToType)**

gShowNodeValue is used to determine where the node value information will be displayed in the graph control. Node name value is part of the full text of the active X and Y Node name and values the label of each set of data points that you have defined for the graph control, without an added ‘Node:’ prompt. The text is formed by the NodeText method. Node Text is returned as the full form as follows:

"Node: name **(X, Y)**"

gShowNodeValue determines if and where the (X, Y) part of the above node text will be displayed

gShowNodeValue uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object’s ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
NodeValueText

gShowNodeValueX (show node x-axis value on target)

gShowNodeValueX **LIKE(gShowToType)**

gShowNodeValueX is used to determine where the node X value information will be displayed in the graph control. The Node X value is the full text of the active X Node.

gShowNodeValueX uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object's ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
NodeXText

gShowNodeValueY (show node y-axis value on target)

gShowNodeValueY **LIKE(gShowToType)**

gShowNodeValueY is used to determine where the node Y value information will be displayed in the graph control. The Node Y value is the full text of the active Y Node.

gShowNodeValueY uses the gShowToType GROUP. Each group element is defined as follows:

eOnT	A BYTE value, when set to TRUE, shows information on graph object's ToolTip
eOnW	A BYTE value, when set to TRUE, shows target information on the WINDOW title
eOnF	A LONG integer that identifies the field equate to show the target information. The target field can be any field capable of displaying the designated information.
eOnS	A LONG integer Number of a zone of a status bar of a condition to show the text.

See Also:
NodeYText

GraphClass Methods

AllText (return full graph text information)

AllText

AllText Process and return full graph text to tool tip.

The **AllText** method reads Mouse, Diagram and Node text information from the MouseText, DiagramText and NodeText methods respectively, and returns a formatted string to use in the graph object's tool tip.

Return Data Type: STRING

Implementation: The AllText method can be called to query the graph object's tool tip text as needed.

See Also: MouseText, DiagramText
NodeText

BeginRefresh (prepare drawing of graph class object)

BeginRefresh

BeginRefresh Force a redraw of graph object

The **BeginRefresh** method carries out the role of a callback function. This method is called at the beginning of the Refresh method, and used for the purpose of preparing the diagram list and their respective nodes to draw.

The default return value is FALSE. If the method returns TRUE, the graph object is not redrawn.

Return Data Type: BOOL

Implementation: The BeginRefresh method is called from the graph object's Refresh method

See Also: Refresh

CalcBestPositionNodeText (calculate graph text best fit position)

CalcBestPositionNodeText

CalcBestPositionNodeText	Calculates the best position of the text used to describe the selected node.

The **CalcBestPositionNodeText** method sets the best position of the node text to be displayed.

Implementation: The method is called if the eBestPositionNodeText property is set to TRUE. This property is set by graph control's procedure template interface. Internally, each node in the graph stores the X and Y position in a local queue.

See Also: CalcGraph

CalcCurrentGraph (calculates values for current graph type)

CalcCurrentGraph

CalcCurrentGraph	Calculates the new parameters for a designated graph type.

The **CalcCurrentGraph** method is used to set the parameters for a designated graph type. In the Graph Control template, a user can dynamically switch graph types at runtime. This method determines which graph type was specified and instantiates a new object used to set parameters specific to that graph type.

Implementation: The method is called from the CalcGraph method each time a graph type changes or the window is initially loaded.

See Also: CalcGraph

CalcCurrentNode (calculates values of current node)

CalcCurrentNode

CalcCurrentNode Calculates all pertinent values for a selected node.

The **CalcCurrentNode** method calculates all attributes of a current node, including fill color, shape, hide property, value, background, min/max values, radius, etc.

Implementation: The method is called from the CalcGraph method., for each node in the current graph type.

See Also: CalcGraph

CalcGraph (calculates all graph object values)

CalcGraph

CalcGraph Calculates all positions, node values and cosmetic settings for a graph control.

The **CalcGraph** method is used to calculate positions and values for a graph's title, legend, axis, and nodes for a specified graph control.

Implementation: The CalcGraph method is called prior to the DrawGraph method.

See Also: CalcCurrentGraph
CalcCurrentNode
CalcBestPositionNodeText

CalcPopup (create popup menu for graph object)

CalcPopup (PopupClass PopupMgr)

CalcPopup	Creates a popup menu control for a selected graph object.
PopupMgr	The reference to an object of a PopupClass type.

The **CalcPopup** method creates a popup menu for specific use with the Graph Class object. It also creates standard popup menu items that are used with all graph types (i.e., Zoom settings).

Implementation: The **CalcPopup** method is called from the GraphClass Popup method, initializing standard menu items for use with all graph types.

See Also: Popup CalcPopupAdd2

CalcPopupAdd2 (create popup menu item text for graph object)

CalcPopupAdd2(*PopupMgr, Text, Name, Items, ItemMask, Check, CheckValue)*

CalcPopupAdd2	Create popup menu items specific to a selected graph type
PopupMgr	The reference to an object of a PopupClass type.
Text	A string constant, variable, EQUATE, or expression containing the text of the menu item. A single hyphen (-) creates a non-selectable separator (a 3D horizontal bar) on the menu. An ampersand (&) designates the next character as the menu item's hot key.
Name	A string constant, variable, EQUATE, or expression containing the menu item name. Other methods refer to the menu item by its *name*, not by its *text*. This lets you apply runtime translation or dynamic reordering of menus without changing your code.
Items	A LONG integer that is bit-mapped and used with *ItemMask* to determine the availability of a popup menu item based on graph type and area.
ItemMask	A LONG integer that is used with *Items* to determine a popup items visibility.
Check	A LONG integer compared with *CheckValue* to determine a popup items initial state (checked/unchecked, enabled/disabled)
CheckValue	A LONG integer that is used with *Check* to determine a popup items current state.

The **CalcPopupAdd2** method adds conditional popup menu items to the graph control popup based on graph type and other factors. If an item has been added correctly, a non-zero value is returned by the method.

Return Data Type: LONG

Implementation: The **CalcPopupAdd2** method is called from the CalcPopup method. A set of properties and equates (see GRAPH.EQU in the \LIBSRC folder) determine the availability of menu items and their initial state.

See Also: CalcPopup

DiagramNameText (create diagram name text)

DiagramNameText(*showtext* **)**

DiagramNameText	Forms the text of diagram's name
showtext	Enable or suppress text to be returned. Default is TRUE.

The **DiagramNameText** method forms the text of a diagram's name. A diagram name is the text name assigned to a given set of the graph control's data points.

The *showtext* parameter defaults to returning the diagram name text. If the *showtext* Boolean value is set to FALSE, an empty string value is returned.

Return Data Type: STRING

Implementation: The **DiagramNameText** method is called from any method that needs to update or refresh a graph control's textual elements.

See Also: ToShowValues, AllText

DiagramText (create diagram name text with prompts)

DiagramText(*showtext* **)**

DiagramText	Forms the full text of a diagram's name
showtext	Enable or suppress text to be returned. Default is TRUE.

The **DiagramText** method forms the full text of a diagram's name. This includes any special prompt information attached to the diagram name. A diagram name is the text name assigned to a given set of the graph control's data points.

The *showtext* parameter defaults to returning the diagram name text. If the *showtext* Boolean value is set to FALSE, an empty string value is returned.

Return Data Type: STRING

Implementation: The **DiagramText** method is called from any method that needs to update or refresh a graph control's textual elements.

See Also: ToShowValues, AllText
DiagramNameText

DiagramNameText (create diagram name text)

DiagramNameText(*showtext* **)**

DiagramNameText Forms the text of diagram's name

showtext Enable or suppress text to be returned. Default is TRUE.

The **DiagramNameText** method forms the text of a diagram's name. A diagram name is the text name assigned to a given set of the graph control's data points.

The *showtext* parameter defaults to returning the diagram name text. If the *showtext* Boolean value is set to FALSE, an empty string value is returned.

Return Data Type: STRING

Implementation: The **DiagramNameText** method is called from any method that needs to update or refresh a graph control's textual elements.

See Also: ToShowValues, AllText

DiagramText (create diagram name text with prompts)

DiagramText(*showtext* **)**

DiagramText Forms the full text of a diagram's name

showtext Enable or suppress text to be returned. Default is TRUE.

The **DiagramText** method forms the full text of a diagram's name. This includes any special prompt information attached to the diagram name. A diagram name is the text name assigned to a given set of the graph control's data points.

The *showtext* parameter defaults to returning the diagram name text. If the *showtext* Boolean value is set to FALSE, an empty string value is returned.

Return Data Type: STRING

Implementation: The **DiagramText** method is called from any method that needs to update or refresh a graph control's textual elements.

See Also: ToShowValues, AllText
DiagramNameText

Draw (calculate and draw GraphClass object)

Draw

Draw Calculates and draws the graph object

The **Draw** method calculates and draws the graph object. It is a parent method that calls other processing methods and divides the individual drawing tasks.

Implementation: The **Draw** method is called from the Resize method which is called from the Refresh method

See Also: Resize

Refresh

CalcGraph

DrawGraph

DrawGraph (draws calculated values)

DrawGraph

DrawGraph Draws the graph object

The **DrawGraph** method draws the graph object, based on calculated values. Its primary purpose is to determine which parts of the graph need to be drawn based on graph type and values.

Implementation: The **DrawGraph** method is called after the CalcGraph method has set the appropriate graph control's values.

See Also: Draw CalcGraph

DrawReport (draw graph object on report)

DrawReport (*parReport*, *parBand*, *parQueue* , [*parBestFit*])

DrawReport	Draws a copy of the graph object into a REPORT structure
parReport	A reference to the target REPORT structure
parBand	A LONG that references the FEQ of the target detail band.
parQueue	The label of the report's print preview queue.
parBestFit	A BYTE value that calculates a best fit when TRUE (Default is FALSE)

The **DrawReport** method draws a copy of the graph object into a REPORT structure and prepares WMF-files for subsequent viewing and printing.

Implementation: The **DrawReport** method is called from the PrintGraph method, prior to the Previewer object is initialized.

See Also: PrintGraph

DrawWallpaper (draw background wallpaper for graph object)

DrawWallpaper

DrawWallpaper	Draws the graph object background wallpaper

The **DrawWallpaper** method draws the graph object background wallpaper. The name of the image file should be set in the *eWallpaperFile* property.

Implementation: The **DrawWallpaper** method is called from the DrawGraph method.

See Also: DrawGraph

DrillDown (transfer control to new graph object)

Drilldown (| *parGraphNpp*, *graphName*, *NodeId*, *NodeName*, *Xnode*, *Ynode* **|)**

Drilldown	Unhides, calculates and draws the target graph object
parGraphNpp	A LONG integer that identifies the GraphID FEQ to process
graphName	String text that identifies the graph name.
NodeID	The positional node value of the active graph control that is passed to the drilldown graph control.
NodeName	The positional node name of the active graph control that is passed to the drilldown graph control.
Xnode	The positional X Node coordinate (in Physical Units) of the active graph control that is passed to the drilldown graph control.
Ynode	The positional Y Node coordinate (in Physical Units) of the active graph control that is passed to the drilldown graph control.

The **Drilldown** method hides the current active graph control, and unhides the target (drilldown) graph control. The target graph object's data points are calculated and drawn.

Optional parameters can be processed by the target drilldown graph control. This allows the target control to be related to the original graph object.

Implementation: The **Drilldown** method is called from the TakeEventOfParent method, when a Drilldown event is posted.

See Also: TakeEventOfParent

ReturnFromDrillDown

FindNearbyNodes (locate nodes based on mouse position)

FindNearbyNodes(*Xpos*, *Ypos***)**

FindNearbyNodes	Finds the closest node based on X and Y Mouse coordinates
Xpos	The current X mouse coordinate position
Ypos	The current Y mouse coordinate position

The **FindNearbyNodes** method returns the closest node id based on the x and y mouse coordinates.

Return Data Type: LONG

Implementation: The **FindNearbyNodes** method is called from the Interactivity method. It is also called in the Drilldown method to accurately return the proper node id when the mouse is clicked.

See Also: Drilldown, Interactivity

GetMouse (get mouse coordinates in all formats)

GetMouse

The GetMouse method is used to retrieve mouse coordinates each time a mouse event has occurred on the graph control.

Implementation: The **GetMouse** method is called from the TakeEventOfParent method, and sets the following properties:

! Coordinates of the mouse in DC units
self.eMouseX (see mousex())
self.eMouseY (see mousey())

! Coordinates of the mouse in logic (independent) units
self.eMouseXl
self.eMouseYl

! Coordinates of the mouse in physical (node)units
self.eMouseXa
self.eMouseYa

See Also: TakeEventOfParent

GetValueFromField (get contents of specified field)

GetValueFromField (*fieldeq* **)**

GetValueFromField	Retrieve text from a specified control.
fieldequ	An LONG integer that indicates the field equate label of the control the text is to be retrieved.

The **GetValueFromField** method is used to return the contents of a specified field for use in other areas of the graph control (i.e., tool tips).

Return Data Type: STRING

Implementation: The **GetValueFromField** method is called from the ToShowValues method.

See Also: AllText, ToShowValues

GetValueFromStatusBar (return status bar zone contents)

GetValueFromStatusBar(*statuszone* **)**

GetValueFromStatusBar	Retrieve text from a window status bar.
statuszone	An LONG integer that indicates which status bar section the text is to be retrieved from.

The **GetValueFromStatusBar** method is used to return the contents of a selected window's status bar zone for use in other areas of the graph control (i.e., tool tips).

Return Data Type: STRING

Implementation: The **GetValueFromStatusBar** method is called from the ToShowValues method.

See Also: AllText, ToShowValues

ImageToWMF (Save object and return WMF file name)

ImagetoWMF

The **ImagetoWMF** method is used to transfer a graph object's current state to a WMF file. This file can be used later for printing or additional processing. **ImagetoWMF** returns the name of the WMF file that the graph image is transferred to.

Return Data Type: STRING

Implementation: The **ImagetoWMF** method is called from the SaveGraph method.

See Also: SaveGraph

Init (Initialize the graph object)

Init (*parWin, parFParent, parL=0, parT=0, parR=0, parB=0***)**

Init Initializes the GraphClass object

parWin The reference to a window where the object is located.

parFParent A LONG identifying the parent id of the graph object.

parL, parT, parR, parB

Indents from borders of the parent for drawing object.

The **Init** method is used to initialize the graph object prior to display. It calls all of the necessary methods used to set default values and position the graph object.

Implementation: Typically, the **Init** method is paired with the Kill method, performing the converse of the Kill method tasks.

See Also: Kill

Interactivity (process mouse location data to tool tip or control

Interactivity

The **Interactivity** method processes the mouse coordinates of a graph control, and finds corresponding nodes of diagrams and displays it on a ToolTip or other appropriate target. It is used to keep the mouse and node data in sync.

Implementation: The **Interactivity** method calls several methods (FindNearbyNodes, SetSelectedNode and ToShowValues) to gather node data. It is called during a MouseMove event.

See Also: TakeEventOfParent

IsOverNode (is mouse over node location)

IsOverNode( )

The **IsOverNode** method is used to detect a node location to pass to the drilldown procedure. A drilldown graph control is normally selected by doubleclicking on a selected node, but the **IsOverNode** method allows node data to be passed when selecting a drilldown graph from the popup menu.

IsOverNode returns TRUE when a valid node was in range when the mouse right-click was pressed. If the user right-clicks over an area where no node is present, the "Drilldown" or "Return from DrillDown" menu options will be disabled.

Return Data Type: BOOL

Implementation: The **IsOverNode** method is called from the CalcPopup method.

See Also: CalcPopup

Kill (shut down the GraphClass object)

Kill

The **Kill** method frees any memory allocated during the life of the GraphClass object and performs any other required termination code.

MouseText (creates text and mouse coordinate information)

MouseText(*parShow* **)**

MouseText	Returns text of the active X and Y mouse coordinates.
parShow	Flag to conditionally suppress return value.

The **MouseText** method returns the text of the active X and Y mouse coordinates. If *parShow* is set to FALSE, the text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **MouseText** method is called from the ToShowValues and AllText method. It is also used to form the text for the ToolTip method.

See Also: AllText, ToShowValues

MouseXText (generate X coordinate text only)

MouseXText(*parShow* **)**

MouseXText	Returns text of the active X mouse coordinate.
parShow	Flag to conditionally suppress return value.

The **MouseXText** method returns the text of the active X mouse coordinate. If *parShow* is set to FALSE, the node text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **MouseXText** method is called from the MouseText method.

See Also: AllText, MouseText

MouseYText (generate Y coordinate text only)

MouseYText(*parShow* **)**

MouseYText	Returns text of the active Y mouse coordinate.
parShow	Flag to conditionally suppress return value.

The **MouseYText** method returns the text of the active Y mouse coordinate. If *parShow* is set to FALSE, the node text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **MouseYText** method is called from the MouseText method.

See Also: AllText, MouseText

NodeNameText (generate current node name identifier)

NodeNameText(*parShow* **)**

NodeNameText	Returns text of the active X and Y Node names.
parShow	Flag to conditionally suppress return value.

The **NodeNameText** method returns the text of the active X and Y Node names. If *parShow* is set to FALSE, the node text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **NodeNameText** method is called from the NodeText method.

See Also: AllText, NodeText

NodeText (generate label, name, and node value)

NodeText(*parShow* **)**

NodeText	Returns text of the active X and Y Node name and values.
parShow	Flag to conditionally suppress return value.

The **NodeText** method returns the full text of the active X and Y Node name and values. If *parShow* is set to FALSE, the node text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **NodeText** method is called from the ToShowValues and AllText methods.

See Also: AllText

NodeTipText (generate node information for tool tip)

NodeTipText(*parShow* **)**

NodeTipText	Returns text of the active node for the tool tip.
parShow	Flag to conditionally suppress return value.

The **NodeTipText** method returns the tool tip text of the active X and Y Node values. If *parShow* is set to FALSE, the return text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **NodeTipText** method is called from the graph object's ToolTip method.

See Also: AllText, ToolTip

NodeValueText (generate current node value text)

NodeValueText(*parShow* **)**

NodeValueText	Returns text of the active X and Y Node values.
parShow	Flag to conditionally suppress return value.

The **NodeValueText** method returns the text of the active X and Y Node values. If *parShow* is set to FALSE, the node text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **NodeValueText** method is called from the method.

See Also: AllText

NodeXText (generate X node text value)

NodeXText(*parShow* **)**

NodeXText	Returns text of the active X Node value.
parShow	Flag to conditionally suppress return value.

The **NodeXText** method returns the text of the active X Node value. If *parShow* is set to FALSE, the node text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **NodeXText** method is called from the NodeValueText method.

See Also: AllText, NodeValueText

NodeYText (generate Y node text value)

NodeYText(*parShow* **)**

NodeYText	Returns text of the active Y Node value.
parShow	Flag to conditionally suppress return value.

The **NodeYText** method returns the text of the active Y Node value. If *parShow* is set to FALSE, the node text is suppressed, and an empty string is returned.

Return Data Type: STRING

Implementation: The **NodeYText** method is called from the NodeValueText method.

See Also: AllText, NodeValueText

Popup (GraphClass object popup menu manager)

Popup

Popup	Creates, displays, and processes the graph object popup menu

The **Popup** method is used to create, display and process the graph object's popup menu (when enabled).

Implementation: The **Popup** method is called if the user right-clicks on a graph control, and the *self.ePopUp* property is set to TRUE.

See Also: CalcPopup

PopupAsk (Display popup menu for graph object)

PopupAsk(*PopupMgr* **)**

PopupAsk	Returns the selected popup menu item name
PopupMgr	The reference to an object of a PopupClass type.

The **PopupAsk** method is used to display and return the graph object popup menu item selected.

Implementation: The **PopupAsk** method is called from the Popup method, and invokes the Ask method refernces by the Popup Class.

See Also: PopupMgr.Ask

PostEvent (send an event to the GraphClass object)

PostEvent (*eventnumber* **)**

PostEvent	Post event to graph object
eventnumber	A LONG value that passes the event number to the graph object

The **PostEvent** method posts an event to the graph object. The graph object event is processed by the appropriate TakeEvent method.

Graph Events are template-defined events, and listed in the SVGRAPH.EQU source file:

```
                          itemize(3000)  ! Events numbered from 3000
event:TitleON               equate       ! To show title
event:TitleOFF              equate       ! To not show title
event:WallpaperON           equate       ! To show Wallpaper
event:WallpaperOFF          equate       ! To not show Wallpaper
event:3DON                  equate       ! To draw in 3D mode (if accessible)
event:3DOFF                 equate       ! To switch off 3D a mode (if accessible)
event:GridON                equate       ! To draw a grid (if accessible)
event:GridOFF               equate       ! To hide a grid (if accessible)
event:GridXON               equate
event:GridXOFF              equate
event:GridYON               equate
event:GridYOFF              equate
event:AxisScaleMinMaxON     equate
event:AxisScaleMinMaxOFF    equate
event:AxisNameON            equate       ! To show the names of Axis
event:AxisNameOFF           equate       ! To not show the names of Axis
event:GradientON            equate
event:GradientOFF           equate
event:NodeMinMaxON          equate       ! To show units of a minimum/maximum
event:NodeMinMaxOFF         equate       ! To not show units of a minimum/maximum
event:NodeLabelON           equate       ! To show the names of nodes
event:NodeLabelOFF          equate       ! To not show the names of nodes
event:NodeValueON           equate       ! To show the values of nodes
event:NodeValueOFF          equate       ! To not show the values of nodes
event:NodeBgrON             equate
event:NodeBgrOFF            equate
event:LegendBoxON           equate
event:LegendBoxOFF          equate
event:ToolTipON             equate
event:ToolTipOFF            equate
event:Zoom                  equate
event:Zoom500               equate
event:Zoom300               equate
event:Zoom200               equate
```

```
event:Zoom100                 equate
event:Zoom50                  equate
event:Zoom25                  equate
event:GraphTypeLine           equate
event:GraphTypeScatterGraph   equate
event:GraphTypeAreaGraph      equate
event:GraphTypeFloatingArea   equate
event:GraphTypeColumnChart    equate
event:GraphTypeColumnWithAccumulation equate
event:GraphTypeBarChart       equate
event:GraphTypeBarWithAccumulation equate
event:GraphTypeFloatingColumn equate
event:GraphTypeFloatingBar    equate
event:GraphTypePieChart       equate
event:GraphSubTypeSimple      equate
event:GraphSubTypeNormalized  equate
event:FigureTypeBar           equate
event:FigureTypeCylinder      equate
event:LegendPosition:None     equate        ! To not show legend
event:LegendPosition:Left     equate
event:LegendPosition:Right    equate
event:LegendPosition:Top      equate
event:LegendPosition:Bottom   equate
event:AxisStyle:None          equate        ! To not show Axis
event:AxisStyle:Standard      equate
event:AxisStyle:Long          equate
event:AxisScale               equate
event:AxisScale:Linear        equate
event:AxisScale:AsMSWord      equate
event:NodeType:None           equate        ! To not show nodes
event:NodeType:Square         equate        ! To set a type of node as a square
event:NodeType:Triangle       equate        ! To set a type of node as a triangle
event:NodeType:Circle         equate        ! To set a type of node as a circle
event:Refresh                 equate        ! To refresh object
event:Draw                    equate        ! To draw object
event:Hide                    equate        ! To hide object
event:UnHide                  equate        ! To unhide object
event:Print                   equate        ! To print diagram
event:PrintBestFit            equate
event:Save                    equate        ! To save diagram
event:SaveAs                  equate        ! To save the diagram under a new name
event:DrillDown               equate
event:ReturnFromDrillDown     equate
                            end
```

See Also: TakeEvent

PrintGraph (send graph object to printer)

PrintGraph(*bestfit* **)**

PrintGraph	Pre-processes and draws graph object
bestfit	A Boolean value that determines best fit or relative printing

The method allows to choose the printer, draw the graph object (using the DrawReport method), Preview the report,and send pages to the printer.

If the *bestfit* flag is set to FALSE (default), the graph object will print "as is", anchoring the object at the top left corner of the paper.

If the *bestfit* flag is set to TRUE, the graph object will resize to a best fit within the band that it is populated.

Implementation: The **PrintGraph** method is called when graph events Event:Print, or Event:PrintBestFit are posted.

See Also: DrawReport

TakeEventOfParent

Refresh (refresh drawing of GraphClass object)

Refresh(*parRefresh* **)**

Refresh	Pre-processes and draws graph object
parRefresh	A Boolean value that determines refresh is active

The **Refresh** method is used to redraw and resize the graph object. This method is called throughout the graph control template when any element of the graph has changed. You can also use the **Refresh** method when data has changed, or initialization of a drilldown graph object is needed.

If the *parRefresh* flag is FALSE (default), the graph object will not be refresh. The BeginRefresh method is used to pre-process the Refresh method, and set the *parRefresh* flag to TRUE if a refresh is ready to execute.

Implementation: The **Refresh** method is called when a graph event (Event:Refresh) is posted.

See Also: BeginRefresh

Resize

Resize (conditional refresh when size changed)

Resize(*redraw* **)**

Resize	Redraws graph object
redraw	A Boolean value that determines conditional redraw

The **Resize** method is used to reposition and redraw the graph object.

If the *redraw* flag is FALSE (default), the graph object will only redraw if the size of the parent field has changed. If the redraw flag is set to TRUE, a redraw is always executed.

Implementation: The **Resize** method is called from the Refresh method when the parRefresh property is set to TRUE.

See Also: Refresh

Draw

ReturnFromDrillDown (transfer control to graph object after drilldown)

ReturnFromDrillDown

(| *parGraphNpp* ,*graphName* ,*NodeId* ,*NodeName* ,*Xnode* ,*Ynode* **|)**

ReturnFromDrilldown
Unhides, calculates and draws the original graph object

parGraphNpp	A LONG integer that identifies the GraphID FEQ to process
graphName	String text that identifies the original graph name.
NodeID	The positional node value of the drilldown graph control that is passed to the active graph control.
NodeName	The positional node name of the drilldown graph control that is passed to the active graph control.
Xnode	The positional X Node coordinate of the drilldown graph control that is passed to the active graph control.
Ynode	The positional Y Node coordinate of the drilldown graph control that is passed to the active graph control.

The **ReturnFromDrilldown** method is used to "drill back" to the original graph object. It is designed to restore the original graph object's state prior to calling the Drilldown method.

Optional parameters can be processed by the target "drill back" graph control. This allows the target control to be related to the drilldown graph object.

Implementation: The **ReturnFromDrilldown** method is called from the TakeEventOfParent method when the graph event Event:ReturnFromDrillDown is posted. This event is triggered when the user double-clicks on a valid graph node, or selects the "Return from DrillDown" popup menu item.

See Also: DrillDown

TakeEventOfParent

SaveAsGraph (save graph to WMF file selected)

SaveAsGraph

SaveAsGraph Save graph to WMF file.

The **SaveAsGraph** method writes the current state of the graph object to a WMF file. The user is prompted to enter a valid WMF file name.

Implementation: The **SaveAsGraph** method calls the SaveGraph method, forcing the *askSave* property to TRUE. The SaveAsGraph method is called when a graph event (Event:SaveAs) is posted.

See Also: SaveGraph

SaveGraph (auto-save graph to WMF file)

SaveGraph(*askSave* **)**

SaveGraph Save graph to WMF file.

askSave A Boolean value that determines whether or not to prompt the user to save. The default value is FALSE (save without asking)

The **SaveGraph** method writes the current state of the graph object to a WMF file. If the *askSave* parameter is set to TRUE, the user is first prompted to enter a valid WMF file name.

Implementation: The **SaveGraph** method is called when a graph event (Event:Save) is posted.

See Also: ImagetoWMF

SetDefault (initialize selected graph properties)

SetDefault

SetDefault	Set initial values on the graph control.

The **SetDefault** method initializes critical properties of the graph object prior to its data point calculations and display. Most of these properties are found in the Initial Settings section of the Graph Control template.

Implementation: The **SetDefault** method is called from the graph object's Init method.

See Also: Init

ShowOnField (show text contents to specified field)

ShowOnField(*text, fieldequ* **)**

ShowOnField	Show text on a selected control.
text	A string constant or variable that contains the text to display on the control.
fieldequ	An LONG integer that indicates the field equate label of the control the text is to be displayed.

The **ShowOnField** method displays a *text* value into a given control, specified by its field equate (*fieldequ*). The control must be a valid target (string, entry, text, or combo). Other types of controls are assigned the text value using the PROP:Text property.

Implementation: The **ShowOnField** method is called from the ToShowValues method.

See Also: ToShowValues

ShowOnStatusBar (show text to status bar zone)

ShowOnStatusBar(*text, zone* **)**

ShowOnStatusBar Show text on the window status bar.

text	A string constant or variable that contains the text to display on the status bar.
zone	An LONG integer that indicates which status bar section the text is to be displayed.

The **ShowOnStatusBar** method displays a *text* value into a given status bar zone, specified by *zone*.

Implementation: The **ShowOnStatusBar** method is called from the ToShowValues method. If a window has a separate status bar defined, the *eShowSBonFirstThread* property determines the target.

See Also: ToShowValues

eShowSBonFirstThread

TakeEvent (process graph control events)

TakeEvent

TakeEvent Processes the events of the graph object.

The **TakeEvent** method is used to process events returned by the graph object. These events are returned by the parent control of the graph object (by default, a GROUP) and to other support controls of the object. In general, all events should be posted to the parent field of the graph object.

Implementation: The **TakeEvent** method is called within the graph object procedure's ACCEPT event handler. It provides a virtual method in which the developer can use to trap and process all graph control events.

See Also: TakeEventOfParent

TakeEventofParent (process all graph events)

TakeEventOfParent

TakeEventOfParent Processes the events of the graph object's parent control.

By default, all graph events are processed by the graph object's parent control (by default, a GROUP). This method is the control center from which other methods are executed and properties are set.

Implementation: The **TakeEventOfParent** method is called from the TakeEvent method.

See Also: TakeEvent

ToolTip (show all text to tool tips)

ToolTip

ToolTip Show tool tip text.

The **ToolTip** method displays all text that is directed to the graph object's tool tip box.

Implementation: The **ToolTip** method is called from the Interactivity method.

See Also: ToShowValues

AllText

Interactivity

ToShowValues (show all composite text to all graph targets)

ToShowValues

ToShowValues Control what text is shown where.

The **ToShowValues** method checks a variety of properties that are set by the graph control template and popup menu, and filter what specific text should be displayed on which target. For example, you may have omitted mouse text from the graph control's tool tip, or limit a control to only displaying the X node values.

Implementation: The **ToShowValues** method is called from the Interactivity method.

See Also: Interactivity

GridClass

GridClass Overview

The GridClass is used to manage and control BrowseGrid controls. These combined controls make up the BrowseGrid control template. At runtime, the BrowseGrid replaces the underlying BrowseBox and arranges the data in as groupds within a matrix format. The data included in this matrix includes all controls populated within the BrowseGrid GROUP control.

The BrowseGrid template is most useful for displaying product lists on a web page, but it may be used on desktop applications as well.

Relationship to Other Application Builder Classes

The GridClass is derived from the BrowseClass. It also implements the IListControl interface which defines the set of behaviors that relate to a LIST control.

GridClass ABC Template Implementation

The ABC BrowseGrid template generates code to instantiate the GridClas for your BrowseBoxes. The GridClass objects are called BRW*n*, where *n* is the template instance number. Multiple grids may be used in a single procedure.

GridClass Source Files

The GridClass source code is installed by default to the Clarion \LIBSRC folder. The specific GridClass source code and its respective components are contained in:

ABGRID.INC	GridClass declarations
ABGRID.CLW	GridClass method definitions

GridClass Properties

GridClass Properties

The GridClass inherits all the properties of the BrowseClass from which it is derived.

Children (reference to child group controls)

Children **&ChildQueue, PROTECTED**

The **Children** property is a reference to a structure containing a list of child contols of the basic GROUP grid control. This queue also contains the position of each of the child controls.

Implementation: This property is initialized in the GridClass.Init method. The QUEUE is loaded with data in **GridClass.CheckChildren** which is a **PRIVATE** method.

The Children property refers to a QUEUE declared in ABGRID.INC.

```
ChildQueue QUEUE,TYPE
Feq         SIGNED
XD          SIGNED
YD          SIGNED
HE          SIGNED
WI          SIGNED
Use         ANY
           END
```

See Also: GridClass.Init

Chosen (current browse queue element)

Chosen **SIGNED, PROTECTED**

The **Chosen** property contains the current browse queue element number.

See Also: GridClass.TakeEvent

ClickPress (forward control)

ClickPress SIGNED, PROTECTED

The **ClickPress** property specifies a control number in which an EVENT:Accepted will be posted to when a mouse click occurs. In a Windows application the mouse click is a DOUBLE-CLICK. An application running in an internet browser will accept the ClickPress control on a single click.

Implementation: The BrowseGrid template assigns the ClickPress control based on the control supplied to the template. The ClickPress action occurs in the GridClass.TakeEvent method.

See Also: GridClass.TakeEvent

ControlBase (base control number)

ControlBase SIGNED, PROTECTED

The **ControlBase** property specifies a base control number that other child control feq values are based on.

Implementation: This property is initialized to 1000 in the GridClass.CheckChildren method.

See Also: GridClass.CheckChildren

ControlNumber (number of controls)

ControlNumber SIGNED, PROTECTED

The **ControlNumber** property specifies the number of controls used per grid element.

Implementation: This property is calculated in the GridClass.CheckChildren method.

See Also: GridClass.CheckChildren

GroupColor (background color of group fields)

GroupColor LONG, PROTECTED

The GroupColor property specifies the background color of the GROUP control. This is used as the background color for all fields displayed in the GROUP as well as for the Group Title. The GROUP text color is also used for these fields.

GroupControl (GROUP control number)

GroupControl SIGNED, PROTECTED

The **GroupControl** property specifies the control number for the GROUP control used by the BrowseGrid. The GROUP control is automatically populated when the BrowseGrid control template is used.

Implementation: The ABC Templates automatically assigns this property its value. If the template is not being used this value should be initializes in the Init method.

GroupTitle (title of group element)

GroupTitle ASTRING, PROTECTED

The **GroupTitle** property contains a string to use as the title for the group box that outlines each entry in the grid.

Implementation: The ABC Templates automatically assigns this property its value. If the template is not being used this value should be initializes in the Init method.

SelColor (color of selected element)

SelColor LONG, PROTECTED

The **SelColor** property specifies the color of the currently selected element of the grid.

Implementation: The ABC Templates automatically assigns this property its value. If the template is not being used this value should be initializes in the Init method.

Selectable (element selectable flag)

Selectable BYTE

The Selectable property indicates that an element (group) in the grid is selectable. Clicking on any elemen in the group will make it the currently selected element of the queue.

Implementation: The ABC Templates automatically assigns this property its value. If the template is not being used this value should be initializes in the Init method.

UpdateControl (file update trigger)

UpdateControl SIGNED

The **UpdateControl** property specifies a contol that when accepted will trigger a file update.

Implementation: The ABC Templates automatically assigns this property its value. If the template is not being used this value should be initializes in the Init method.

UpdateControlEvent

UpdateControlEvent SIGNED

The **UpdateControlEvent** property is not currently implemented.

GridClass Methods

The GridClass inherits all the methods of the BrowseClass from which it is derived.

AddLocator (specify a locator)

AddLocator(*locator***)**

AddLocator	Specifies a locator object for a specific sort order.
locator	The label of the locator object.

The **AddLocator** method specifies a locator object for the sort order defined by the preceeding call to the AddSortOrder or SetSort method.

Implementation: The specified *locator* is sort order specific. It is enabled only when the associated sort order is active.

See Also: BrowseClass.AddSortOrder, BrowseClass.AddLocator

FetchRecord (retrieve selected record)

FetchRecord(*record***)**

FetchRecord	Retrieve selected record.
record	An integer constant, variable, EQUATE, or expression that indicates which entry number in the LIST to read.

The **FetchRecord** method is used in conjunction with the WebBuilder WebGridExtension. This method is used to read the currently selected record into memory.

Implementation: This method is called by the WbGridHTMLProperties.SetProperty method.

GetAcross (number of horizontal grids)

GetAcross

The **GetAcross** method returns the number of GROUPs that fit into the designed listbox.

Implementation: The GetAcross method returns a value that is determined in the GridClass.GetDimensions PRIVATE method.

Return Data Type: SIGNED

GetClickPress (forward click control)

GetClickPress

The **GetClickPress** method returns the control number of the control to be accepted. This control is specified in the BrowseGrid template by the *Forward other control clicks to:* prompt.

Implementation: The GridClass.TakeEvent method executes code that will post an EVENT:Accepted to SELF.ClickPress, which is the value that this method returns.

Return Data Type: SIGNED

See Also: GridClass.TakeEvent

GetDown (number of vertical grids)

GetDown( )

The **GetDown** method returns the number of GROUPs that fit into the designed listbox.

Implementation: The GetDown method returns a value that is determined in the GridClass.GetDimensions PRIVATE method.

Return Data Type: SIGNED

GetPosition (retrieve group control position)

GetPosition(*instance***,** *XPos***,** *Ypos***), VIRTUAL, PROTECTED**

GetPosition	Sets the XPosition and YPosition for the control *instance*.
instance	A numeric constant, variable, EQUATE, or expression containing the control number.
XPos	An integer constant, variable, EQUATE, or expression that indicates the X position of the specific GROUP control instance.
YPos	An integer constant, variable, EQUATE, or expression that indicates the Yposition of the specific GROUP control instance.

Implementation: The GetPosition method is called to set the X and Y positions of the GROUP control is created to simulated the grid appearance. This control is created in the GridClass.CreateControls PRIVATE method.

IfGroupField (determine if current control is a GROUP)

IfGroupField(*field***)**

IfGroupField	Determines if the control in focus is a GROUP control.
field	A numeric constant, variable, EQUATE, or expression containing the control number of the control that currently has focus.

The **IfGroupField** method determines if the control currently in focus is a GROUP control. A one (1 or Trie) is returned if the control is GROUP control, otherwise a zero (0 or False) is returned.

Implementation: This method is called by the GridClass.TakeEvent method when an event occurs on any control defined as part of the BrowseGrid.

See Also: GridClass.TakeEvent

Return Data Type: BYTE

Init (initialize the GridClass object)

Init(listcontrol, viewposit, view listqueue, relationmanager, windowmanager)

Init	Initializes the GridClass object.
listcontrol	A numeric constant, variable, EQUATE, or expression containing the control number of the LIST control.
viewposition	The label of a string field withing the *listqueue* containing the POSITION of the view.
view	The label of the browse's underlying VIEW.
listqueue	The label of the *listcontrol's* data source QUEUE.
relationmanager	The label of the browse's primary file RelationManager object. See *Relation Manager* for more information.
windowmanager	The label of the browse'WindowManager object. See *Window Manager* for more information.

The **Init** method initializes the GridClass object.

Implementation: In addition to other things, the Init method calls the PARENT.Init method to initialize the browse's ViewManager object.

See Also: BrowseClass.Init

IsSkelActive

IsSkelActive, VIRTUAL

The **IsSkelActive** method is not implemented at this time.

Return Data Type: BYTE

Kill (shutdown the GridClass object)

Kill, DERIVED

The **Kill** method shuts down the GridClass object. It frees any memory allocated during the life of the objects and performs any other necessary cleanup code.

SetAlerts (initialize and create child controls)

SetAlerts, DERIVED

The **SetAlerts** method initiates the managing and storage of child controls to the BrowseGrid.

SyncGroup (initialize GROUP field properties)

SyncGroup(*record***)**

SyncGroup	Initialize the GROUP field properties.
record	An integer constant, variable, EQUATE, or expression that indicates which entry number in the LIST to read.

The **SyncGroup** method is used in conjunction with the WebBuilder WebGridExtension. This method is used to initialize the GROUP control properties such as Group Title, Group Box, and Group color.

Implementation: This method is called by the WbGridHTMLProperties.SetProperty method.

TakeEvent (process the current ACCEPT loop event)

TakeEvent, DERIVED

The **TakeEvent** method processes the current ACCEPT loop for the GridClass object. The method handles all events associated with the Grid controls including the parent GROUP control and all of its children.

Implementation: When this method completes its PARENT method is called.

See Also: BrowseClass.TakeEvent

UpdateRecord (refresh BrowseGrid)

UpdateRecord (*record*), VIRTUAL

UpdateRecord	Refresh the data in the BrowseGrid.
record	A numeric constant, variable, EQUATE, or expression that indicates which entry number in the LIST to update.

The **UpdateRecord** method refreshes the data shown in the BrowseGrid by calling the FileManager to post data updates. The BrowseClass.ResetFromBuffer is then called to update the queue that is used for the LIST and then the BrowseClass.UpdateViewRecord to update the VIEW.

Implementation: This method is called by the GridClass.TakeEvent method.

See Also: GridClass.TakeEvent, FileManager.Update, BrowseClass.ResetFromBuffer, BrowseClass.UpdateViewRecord

UpdateWindow (refresh window display)

UpdateWindow, DERIVED

The **UpdateWindow** method calls the PARENT UpdateWindow method to update all display variables and refreshes the BrowseGrid control values and properties.

Implementation: The UpdateWindow method is called by the GridClass.TakeEvent method.

See Also: BrowseClass.UpdateWindow. GridClass.TakeEvent

HistHandlerClass

HistHandlerClass Source Files

The HistHandlerClass source code is installed by default to the Clarion \LIBSRC. The specific ErrorClass source code and their respective components are contained in:

ABERROR.INC	HistHandlerClass declarations
ABERROR.CLW	HistHandlerClass method definitions
ABERROR.TRN	HistHandlerClass default error definitions

HistHandlerClass Properties

The HistHandlerClass contains the following properties:

Err (errorclass obejct)

Err &ErrorClass, PROTECTED

The **Err** property is a reference to the ErrorClass object that handles any runtime errors.

History (error history structure)

History &ErrorHistoryList,PROTECTED

The **History** property is a reference to the ErrorHistoryList structure that holds the history for errors that have previously occurred. The error History is determined based on the HistoryThreshold and HistoryResetOnView properties.

LBColumns (number of listbox columns)

LBColumns SHORT, PROTECTED

The **LBColumns** property represents the number of columns in the list box on the MsgBox window.

Win (reference to window)

Win &Window, PROTECTED

The **Win** property is a reference to the message box window, which the HistHandler uses.

HistHandlerClass Methods

The HistHandlerClass contains the following methods:

Init (initialize the HistHandlerClass object)

Init(*win***,** *err***,** *history***)**

Init	Initialize the HistHandlerClass object.
win	A reference to the message box window which the HistHandler uses.
err	The label of the ErrorClass object.
history	A reference to the ErrorHistoryList structure that holds the history for errors that have previously occurred.

The **Init** method initializes the HistHandlerClass object. This object is initialized from the ErrorClass.HistoryMsg method.

See Also: ErrorClass.HistoryMsg

TakeEvent (process window events)

TakeEvent, VIRTUAL

The **TakeEvent** method processes the MsgBox window events. In particular the OpenWindow event is processed. Upon the EVENT:OpenWindow, the LIST control is interrogated. A Level:Benign is returned.

Return Data Type: BYTE

VLBProc (retrieve LIST and error history information.)

VLBProc(*rowindex***,** *colindex***), VIRTUAL, PROTECTED**

VLBProc	Retrieve LIST and error history information.
rowindex	An index used to determine information regarding the listbox and associated history data.
colindex	An index used to determine inforamtion regarding an actual error history record.

The **VLBProc** method returns various information regarding the LIST control and its data.

Implementation: If passed a *rowindex* of -1, the VLBProc returns the number of history error records that are contained in the error history queue. If passed a rowindex of -2, the method returns the number of listbox columns.

Any positive integer passed as the rowindex will cause the VLBProc to lookup the error history record at the relative rowindex position. The *colindex* parameter is used in association with a positive integer rowindex. A colindex value of 1 will return the error text. A colindex of 2 will return the error category.

Return Data Type: STRING

IDbChangeAudit Interface

IDbChangeAudit Concepts

The IDbChangeAudit interface defines a set of common methods the DbAuditManager object must implement in order for the object to handle additions, updates and deletions to the audit files.

Relationship to Other Application Builder Classes

The DbAuditManager implements the IDbChangeAudit interface.

IDbChangeAudit Source Files

The IDbChangeAudit source code is installed by default to the Clarion \LIBSRC folder. The specific IDbChangeAudit source code and their respective components are contained in:

ABFILE.INC	IDbChangeAudit interface declaration
ABFILE.CLW	DbAuditManager.IDbChangeAudit method definitions

IDbChangeAudit Methods

The IDbChangeAudit interface defines the following methods.

BeforeChange (update audit log file before file change)

BeforeChange(*filename***,** *BFP***), VIRTUAL**

BeforeChange

filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
BFP	The label of aBufferedPairsClass object. See *BufferedPairsClass* for more information.

Implementation: BeforeChange is a VIRTUAL method that lets you easily implement your own custom version of this method. This method can be called to process code before the record buffer is saved. This method calls the DbAuditManager.BeforeChange method.

See Also: DbAuditManager.BeforeChange

ChangeField (virtual method for managing field changes)

ChangeField(*left***,** *right***,** *fieldname***,** *filename***), VIRTUAL**

ChangeField	Manage field changes.
left	The label of the "left" field of the pair that contains the original value of the field being updated. The field may be any data type, but may not be an array.
right	The label of the "right" field of the pair that contains the new value of the field being updated. The field may be any data type, but may not be an array.
fieldname	A string constant, variable, EQUATE, or expression containing the label of the field that is to be audited.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is audited.

The **ChangeField** method is called for each field in the record that has changed. The before and after values are passed to this method. This method calls DbAuditManager.OnFieldChange.

Implementation: **ChangeField** is a VIRTUAL method so that other base class methods can directly call the OnFieldChange virtual method in a derived class. This lets you easily implement your own custom version of this method.

See Also: DbAuditManager.OnFieldChange

OnChange (update audit log file after a record change)

OnChange(*filename***,** *file***), VIRTUAL**

OnChange	Initiates an update to the audit log file after a Change to the file.
filename	A string constant, variable, EQUATE, or expression containing the label of the file that is to be audited.
file	The label of the FILE being auditied.

The **OnChange** method initiates the update to the audit log file after a Change action.

Implementation: The OnChange method is a VIRTUAL method so that other base class methods can directly call the OnChange virtual method in a derived class. This lets you easily implement your own custom version of this method.

See Also: DbAuditManager.OnChange

IListControl Interface

IListControl Concepts

The IListControl interface is a defined set of behaviors that relate to a LIST control.

Relationship to Other Application Builder Classes

The StandardBehavior class implements the IListControl interface.

IListControl Source Files

The IListControl source code is installed by default to the Clarion \LIBSRC folder. The specific IListControl source code and their respective components are contained in:

ABBROWSE.INC	IListControl interface declaration
ABBROWSE.CLW	IListControl method definitions

IListControl Methods

The IListControl interface defines the following methods.

Choice(returns current selection number)

Choice

The **Choice** method returns the entry number of the highlighted record in a LIST control.

Return Data Type: SIGNED

Example:

```
Self.CurrentChoice = SELF.ILC.Choice()
!Returns 2 if second record in LIST is highlighted
```

GetControl(returns control number)

GetControl

The **GetControl** method returns the control number (field equate) for a LIST control.

Return Data Type: SIGNED

Example:

```
SELF.ListControl = Li.GetControl()
```

GetItems(returns number of entries)

GetItems

The **GetItems** method returns the number of entries visible in a LIST control.

Return Data Type: SIGNED

Example:

```
LI = SELF.ILC.GetItems()
```

GetVisible(returns visibility of control)

GetVisible

The **GetVisible** method returns a value indicating whether the control is currently visible on the window. An empty string is returned if the control is not showing.

Return Data Type: BYTE

Example:

```
IF ~SELF.ILC.GetVisible()        !If control is not visible
  MESSAGE('Control is not visible')
END
```

SetChoice(change selected entry)

SetChoice(*newchoice***)**

SetChoice	Changes the selected entry in a LIST control.
newchoice	An integer constant, variable, EQUATE, or expression that specifies the new entry to select in a LIST control.

The **SetChoice** method changes the selected entry in a LIST control.

Example:

```
SELF.ILC.SetChoice(SELF.CurrentChoice) !Set new selected entry to
Self.CurrentChoice
```

SetControl(change selected entry)

SetControl(*newccontrol***)**

SetControl	Changes the selected control.
newcontrol	An integer constant, variable, EQUATE, or expression that specifies the new control to select.

The **SetControl** method changes the selected control.

IncrementalLocatorClass

IncrementalLocatorClass Overview

The IncrementalLocatorClass is an EntryLocatorClass that activates on each additional search character added to the search value (not when the locator control is accepted).

Use an Incremental locator when you want a multi-character search on numeric or alphanumeric keys and you want the search to take place immediately upon the end user's keystroke.

IncrementalLocatorClass Concepts

An IncrementalLocator is a multi-character locator, with no locator control required (but strongly recommended).

The locator control may be a STRING, ENTRY, COMBO, or SPIN, however, any control other than a STRING causes the Incremental locator to behave like an Entry locator--the search is delayed until the control is accepted.

With a STRING control (or no control), when the BrowseClass LIST has focus, keyboard input characters are automatically added to the locator's search value string for each keystroke, and the BrowseClass *immediately* advances to the nearest matching record. The Backspace key removes characters from the locator's search value string.

We strongly recommend using a STRING control as the Incremental Locator control for the following reasons:

So the search occurs *immediately* with each keystoke, and

So the user can *see* the value for which the BrowseClass object is searching.

IncrementalLocatorClass Relationship to Other Application Builder Classes

The BrowseClass uses the IncrementalLocatorClass to locate and scroll to the nearest matching item. Therefore, if your program's BrowseClass objects use an Incremental Locator, your program must instantiate the IncrementalLocatorClass for each use. Once you register the IncrementalLocatorClass object with the BrowseClass object (see BrowseClass.AddLocator), the BrowseClass object uses the IncrementalLocatorClass object as needed, with no other code required. See the Conceptual Example.

IncrementalLocatorClass ABC Template Implementation

The ABC BrowseBox template generates code to instantiate the IncrementalLocatorClass for your BrowseBoxes. The IncrementalLocatorClass objects are called BRW*n*::Sort#:Locator, where *n* is the template instance number and # is the sort sequence (id) number. As this implies, you can have a different locator for each BrowseClass object sort order.

You can use the BrowseBox's **Locator Behavior** dialog (the **Locator Class** button) to derive from the EntryLocatorClass. The templates provide the derived class so you can modify the locator's behavior on an instance-by-instance basis.

IncrementalLocatorClass Source Files

The IncrementalLocatorClass source code is installed by default to the Clarion \LIBSRC folder. The IncrementalLocatorClass source code and its respective components are contained in:

ABBROWSE.INC	IncrementalLocatorClass declarations
ABBROWSE.CLW	IncrementalLocatorClass method definitions

IncrementalLocatorClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a BrowseClass object and related objects, including a IncrementalLocatorClass object. The example initializes and page-loads a LIST, then handles a number of associated events, including scrolling, updating, and locating records.

Note that the WindowManager and BrowseClass objects internally handle the normal events surrounding the locator.

```
   PROGRAM
   INCLUDE('ABWINDOW.INC')          !declare WindowManager class
   INCLUDE('ABBROWSE.INC')          !declare BrowseClass and Locator
   MAP
   END

State        FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey  KEY(ST:STATECODE),NOCASE,OPT
Record        RECORD,PRE()
STATECODE      STRING(2)
STATENAME      STRING(20)
              END
             END
```

```
StView    VIEW(State)                !declare VIEW to process
          END
StateQ    QUEUE                      !declare Q for LIST
ST:STATECODE  LIKE(ST:STATECODE)
ST:STATENAME  LIKE(ST:STATENAME)
ViewPosition  STRING(512)
          END

Access:State CLASS(FileManager)      !declare Access:State object
Init         PROCEDURE
             END
Relate:State CLASS(RelationManager)  !declare Relate:State object
Init         PROCEDURE
             END
VCRRequest  LONG(0),THREAD

StWindow WINDOW('Browse States'),AT(,,123,152),IMM,SYSTEM,GRAY
      PROMPT('Find:'),AT(9,6)
      STRING(@s2),AT(29,4),USE(ST:STATECODE)  !locator control
      LIST,AT(8,5,108,124),USE(?StList),IMM,HVSCROLL,FROM(StateQ),|
      FORMAT('27L(2)|M~CODE~@s2@80L(2)|M~STATENAME~@s20@')
     END



ThisWindow CLASS(WindowManager)       !declare ThisWindow object
Init     PROCEDURE(),BYTE,PROC,VIRTUAL
Kill     PROCEDURE(),BYTE,PROC,VIRTUAL
           END
BrowseSt  CLASS(BrowseClass)          !declare BrowseSt object
Q         &StateQ
          END

StLocator  IncrementalLocatorClass    !declare StLocator object
StStep   StepStringClass              !declare StStep object

 CODE
 ThisWindow.Run()                     !run the window procedure

ThisWindow.Init  PROCEDURE()          !initialize things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()          !call base class init
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Init                    !initialize Relate:State object
 SELF.FirstField = ?StList            !set FirstField for ThisWindow
 SELF.VCRRequest &= VCRRequest        !VCRRequest not used
 Relate:State.Open                    !open State and related files
```

```
 !Init BrowseSt object by naming its LIST,VIEW,Q,RelationManager & WindowManager
 BrowseSt.Init(?StList,StateQ.ViewPosition,StView,StateQ,Relate:State,SELF)
 OPEN(StWindow)
 SELF.Opened=True
 BrowseSt.Q &= StateQ                !reference the browse QUEUE
 StStep.Init(+ScrollSort:AllowAlpha,ScrollBy:Runtime)   !initialize the StStep object
 BrowseSt.AddSortOrder(StStep,ST:StateCodeKey)!set the browse sort order
 BrowseSt.AddLocator(StLocator)      !plug in the browse locator
 StLocator.Init(?ST:STATECODE,ST:STATECODE,1,BrowseSt)  !initialize the locator object
 BrowseSt.AddField(ST:STATECODE,BrowseSt.Q.ST:STATECODE)!set a column to browse
 BrowseSt.AddField(ST:STATENAME,BrowseSt.Q.ST:STATENAME)!set a column to browse
 SELF.SetAlerts()                    !alert any keys for ThisWindow
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()         !shut down things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()         !call base class shut down
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Close                  !close State and related files
 Relate:State.Kill                   !shut down Relate:State object
 GlobalErrors.Kill                   !shut down GlobalErrors object
 RETURN ReturnValue
```

IncrementalLocatorClass Properties

IncrementalLocatorClass Properties

The IncrementalLocatorClass inherits all the properties of the EntryLocatorClass from which it is derived. See *EntryLocatorClass Properties* and *LocatorClass Properties* for more information.

IncrementalLocatorClass Methods

IncrementalLocatorClass Methods

The IncrementalLocatorClass inherits all the methods of the EntryLocatorClass from which it is derived. See *EntryLocatorClass Methods* and *LocatorClass Methods* for more information.

SetAlerts (alert keystrokes for the LIST control:IncrementalLocatorClass)

SetAlerts(*control* **), VIRTUAL**

SetAlerts	Alerts appropriate keystrokes for the specified LIST control.
control	An integer constant, variable, EQUATE, or expression that resolves to the control number of the LIST or COMBO control displaying the data to be searched.

The **SetAlerts** method alerts appropriate keystrokes for the specified LIST control.

Implementation: The SetAlerts method alerts the backspace key and the space key.

Example:

```
MyBrowseClass.SetAlerts PROCEDURE                   !alert keys for browse object
I BYTE,AUTO
 CODE
 LOOP I = 1 TO RECORDS( SELF.Sort )                 !for each sort order
  GET( SELF.Sort, I )
  IF ~ ( SELF.Sort.Locator &= NULL )                !if locator is present
   SELF.Sort.Locator.SetAlerts( SELF.ListControl )! call Locator.SetAlerts method
  END
 END
```

TakeKey (process an alerted keystroke:IncrementalLocatorClass)

TakeKey, VIRTUAL

The **TakeKey** method processes an alerted locator keystroke for the LIST control that displays the data to be searched, and returns a value indicating whether the browse display should change.

Tip: By default, all alphanumeric keys are alerted for LIST controls.

Implementation: The TakeKey method adds to or subtracts from the search value (the Shadow property) based on the end user's keystrokes, then returns one (1) if a new search is required or returns zero (0) if no new search is required. A search is required only if the keystroke is a valid search character.

Return Data Type: BYTE

Example:

```
CheckLocator ROUTINE
 IF SELF.Sort.Locator.TakeKey()          !handle locator alerted keys
  SELF.Reset(1)                          !if search needed, reset view
  SELF.ResetQueue(Reset:Done)            ! and relead queue
 ELSE                                    !if no search needed
  SELF.ListControl{PROP:Selected}=SELF.CurrentChoice   !highlight selected list item
 END
```

See Also: EntryLocatorClass.Shadow

INIClass

INIClass Overview

The INIClass provides a simple interface to different methods of non-volatile storage (e.g., storage that is persistent beyond the life cycle of your programs). By default, the INIClass object centrally handles reads and writes for a given configuration (.INI) file. It also supports other methods of non-volatile storage by allowing read and write access to the Windows system registry or a local table. The INIClass Init method controls which access method is used.

INIClass Concepts

By convention an INI file is an ASCII text file that stores information between computing sessions and contains entries of the form:

```
[SECTION1]
ENTRY1=value
ENTRYn=value
[SECTIONn]
ENTRY1=value
ENTRYn=value
```

The INIClass automatically creates INI files and the sections and entries within them. The INI class also updates and deletes sections and entries. In particular, the INIClass makes it very easy to save and restore Window sizes and positions between sessions; plus it provides a single repository for INI file code, so you only need to specify the INI file name in one place.

INIClass Relationship to Other Application Builder Classes

The PopupClass and the PrintPreviewClass optionally use the INIClass; otherwise, it is completely independent of other Application Builder Classes.

INIClass ABC Template Implementation

The ABC Templates generate code to instantiate a global INIClass object called INIMgr. If you request to **Use INI file to save and restore program settings** in the **Global Properties** dialog, then each procedure based on the Window procedure template (Frame, Browse, and Form) calls the INIMgr to save and restore its WINDOW's position and size.

INIClass Source Files

The INIClass source code is installed by default to the Clarion \LIBSRC folder. The INIClass source code and its respective components are contained in:

ABUTIL.INC	INIClass declarations
ABUTIL.CLW	INIClass method definitions

INIClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate an INIClass object.

```
  PROGRAM

  INCLUDE('ABUTIL.INC')              !declare INIClass class
  MAP
  END

INIMgr  INIClass                     !declare INIMgr object
Sound   STRING('ON ')                !user's sound preference
Volume  BYTE(3)                      !user's volume preference

PWindow  WINDOW('Preferences'),AT(,,89,34),MAX,RESIZE
      CHECK('&Sound'),AT(8,6),USE(Sound),VALUE('ON','OFF')
      PROMPT('&Volume'),AT(31,19),USE(?VolumePrompt)
      SPIN(@s20),AT(8,20,21,7),USE(Volume),HVSCROLL,RANGE(0,9),STEP(1)
      BUTTON('OK'),AT(57,3,30,10),USE(?OK)
     END
 CODE
 INIMgr.Init('.\MyApp.INI')          !initialize the INIMgr object
 INIMgr.Fetch('Preferences','Sound',Sound)      !get sound, default 'ON'
 Volume=INIMgr.TryFetch('Preferences','Volume') !get volume, no default
 IF Volume
  Sound=INIMgr.FetchField('Preferences','Sound&Vol',1)  !get comma delimited sound
  Volume=INIMgr.FetchField('Preferences','Sound&Vol',2) !get comma delimited volume
 END
 OPEN(PWindow)
 INIMgr.Fetch('Preferences',PWindow)            !restore window size & pos
 ACCEPT
  IF EVENT() = EVENT:Accepted
   IF FIELD() = ?OK
    INIMgr.Update('Preferences','Sound',Sound)   !store sound
    INIMgr.Update('Preferences','Volume',Volume) !store volume
    INIMgr.Update('Preferences','Sound&Vol',|    !store comma delimited values
    CLIP(Sound)&','&Volume)                      !e.g., Sound&Vol=ON,3
    POST(EVENT:CloseWindow)
   END
  END
 END
 INIMgr.Update('Preferences',PWindow)       !store window size & pos
```

INIClass Properties

INIClass Properties

The INIClass contains the following properties.

FileName

FileName CSTRING(File:MaxFilePath)

The **FileName** property contains the name of the managed storage medium (INI file or system registry key). The INIClass methods use the FileName property to identify the storage medium.

If a full path is specified, and the INIClass Init Method has specified INI file storage, the INIClass looks for the file in the specified path. If no path is specified, the INIClass looks for the file in the Windows directory. If no name is specified (''), the INIClass uses the WIN.INI file. For example:

FileName Property	**Resulting INI File**
' '	c:\Windows\WIN.INI
'invoice.cfg'	c:\Windows\invoice.cfg
'.\invoice.cfg'	*current directory*\invoice.cfg
'c:\invoice\invoice.cfg'	c:\invoice\invoice.cfg

If the INIClass Init Method has specified system registry storage, the INIClass looks for the specified registry key.

The Init method sets the contents of the FileName property.

Implementation: The INIClass methods use the FileName property as the file parameter in GETINI and PUTINI statements. See the *Language Reference* for more information.

See Also: Init

INIClass Methods

The INIClass contains the following methods.

Fetch (get INI file entries)

```
Fetch( section,   | entry, value, filename    |),VIRTUAL, PROTECTED
                  | entry [, value]          |
                  | window                   |
```

Fetch	Gets or returns values from the INI file.
section	A string constant, variable, EQUATE, or expression containing the INI file section name.
entry	A string constant, variable, EQUATE, or expression containing the INI file entry name.
value	The label of a variable that contains the default fetched value and receives the actual fetched value. If omitted, there must be a matching *section* and *entry* in the INI file for the Fetch method to return.
filename	A string constant, variable, EQUATE, or expression containing the INI file name. If *filename* specifies a full path, the Fetch method looks for the file in the specified path. If no path is specified, the Fetch method looks for the file in the Windows directory. If *filename* is specified as null (''), the Fetch method uses the WIN.INI file.
window	The label of the WINDOW or APPLICATION to restore to its previously stored position and size. If this parameter is present, Fetch does not return a value, but restores the *window*'s position and size.

The **Fetch** method gets or returns values from the INI file.

Fetch(*section,entry*[*,value*])
Retrieves a single value specified by *section* and *entry* from the INI file specified in the INIClass.FileName property. If a *value* parameter is present, the Fetch method updates it with the requested value and returns nothing. If no *value* parameter is present the Fetch method returns the requested value.

Fetch(*section,entry,value,filename*)
Retrieves a single value specified by *section* and *entry* from the INI file specified by *filename*. The *value* parameter is updated with the requested value. If the *entry* or *filename* does not exist in the INI file, the Fetch method returns an empty string.

Fetch(*section,window*)
Retrieves and restores several WINDOW attributes saved by a prior corresponding call to Update(*section,window*) from the INI file specified in the INIClass.FileName property. Restoring the values returns the specified WINDOW to its saved position and size.

Implementation: If a *window* is present, the Fetch method gets five entries from the specified INI file *section*: Maximize, XPos, YPos, Height, and Width. Then it applies the retrieved values to the specified WINDOW or APPLICATION.

Return Data Type: STRING where prototype is Fetch(*section*, *name*, *value*, *filename*)
STRING where prototype is Fetch(*section*, *name*)

Example:

```
Sound   STRING('ON ')
PWindow  WINDOW('Preferences'),AT(,,89,34),IMM,MAX,RESIZE
          CHECK('&Sound'),AT(8,6),USE(Sound),VALUE('ON','OFF')
          BUTTON('OK'),AT(57,3,30,10),USE(?OK)
         END
 CODE
 INIMgr.Fetch('Preferences','Sound',Sound)      !get 'Sound', default ON
 Sound=INIMgr.Fetch('Preferences','Sound')      !return 'Sound', no default
 Sound=INIMgr.Fetch('Preferences','Sound',Sound,'MYAPP.INI')
 !get 'Sound', from MYAPP.INI
 OPEN(PWindow)
 INIMgr.Fetch('Preferences',PWindow)            !restore PWindow size & position
```

See Also: Update

FetchField (return comma delimited INI file value)

FetchField(*section, entry, field* **)**

FetchField	Returns a comma delimited value from the INI file.
section	A string constant, variable, EQUATE, or expression containing the INI file section name.
entry	A string constant, variable, EQUATE, or expression containing the INI file entry name.
field	An integer constant, variable, EQUATE, or expression identifying the comma delimited value to return.

The **FetchField** method returns one of several comma delimited values from the INI file. FetchField assumes the value for the *entry* is one of several comma delimited values of the form V1,V2,...,Vn. For example:

```
[MySection]
MyEntry=M,35,Blue,Brown,160
```

A *field* value of one (1) returns the value prior to the first comma in the string; a value of two (2) returns the value between the first and second commas; a three (3) returns the value between the second and third commas, etc.

Return Data Type: STRING

Example:

```
Sound    STRING('ON ')
Volume   BYTE(3)
  CODE
 INIMgr.Update('Preferences','Sound&Volume', |            !create INI entry like
 CLIP(Sound)&','&Volume)                                  !Sound&Volume=ON,3
 !program code
 Sound=INIMgr.FetchField('Preferences','Sound&Volume',1)  !get 1st value - 'ON'
 Volume=INIMgr.FetchField('Preferences','Sound&Volume',2) !get 2nd value - 3
```

FetchQueue (get INI file queue entries)

FetchQueue(*section, entry, queue, field* [,*field*] [,*field*] **)**

FetchQueue	Adds a series of values from the INI file to a QUEUE.
section	A string constant, variable, EQUATE, or expression containing the INI file section name.
entry	A string constant, variable, EQUATE, or expression containing the INI file entry name.
queue	The label of the QUEUE to receive the values.
field	The label of the field in the QUEUE to receive the value. You must specify at least one field, and you may specify up to three fields.

The **FetchQueue** method adds a series of values from the INI file into the specified *field*s in the specified *queue*.

Implementation: FetchQueue assumes multiple *entry* values of the form:

```
[section]
entry=ItemsInQueue
entry_n=value,optionalvalue,optionalvalue
```

for example:

```
[Users]
User=3
User_1=Fred,1
User_2=Barney,0
User_3=Wilma,1
```

Example:

```
UserQ   QUEUE
Name     STRING(20)
Auth     BYTE
        END
 CODE
 INIMgr.FetchQueue('Users','User',UserQ,UserQ.Name,UserQ.Auth)!get UserQ
 !program code
 INIMgr.Update('Users','User',RECORDS(UserQ))                 !put UserQ count
 LOOP i# = 1 TO RECORDS(UserQ)                                !put UserQ entries
  GET(UserQ,i#)
  INIMgr.Update('Users','User_'&i#,CLIP(UserQ.Name)&','&UserQ.Auth)
 END
```

Init (initialize the INIClass object)

Init (*FileName*, [*NvType*], [*ExtraData*])

Init	Initializes the INIClass object.
filename	A string constant, variable, EQUATE, or expression containing the INI file name. If *filename* specifies a full path, the INIClass looks for the file in the specified path. If no path is specified, the INIClass looks for the file in the Windows directory. If *filename* is specified as null (''), the INIClass uses the WIN.INI file.
NvType	An UNSIGNED integer that conforms to the following equates: NVD_INI use named INI file. NVD_Registry use the system registry (ignores the filename parameter) NVD_Table use a local table – NOT SUPPORTED YET
ExtraData	A LONG integer. When the registry is used in the second parameter, *ExtraData* is used to specify the part of the registry to use as the root of all entries. Valid values are: REG_CLASSES_ROOT REG_CURRENT_USER REG_LOCAL_MACHINE REG_USERS REG_PERFORMANCE_DATA REG_CURRENT_CONFIG REG_DYN_DATA

The **Init** method initializes the INIClass object.

Implementation: The Init method assigns *filename* to the FileName property.

Example:

```
  INCLUDE('ABUTIL.INC')
INIMgr               INIClass
 CODE
 INIMgr.Init('c:\MyApp\MyApp.INI')   !read & write from c:\MyApp\MyApp.INI
 INIMgr.Init('.\MyApp.INI')          !read & write from currentdirectory\MyApp.INI
 INIMgr.Init('')                     !read & write from c:\Windows\WIN.INI
 INIMgr.Init('MyApp.INI')            !read & write from c:\Windows\MyApp.INI

 INIMgr.Init('', NVD_Registry, REG_LOCAL_MACHINE)
 !read & write from Windows system registry, using LOCAL_MACHINE as the root

 INIMgr.Init('CONFIG.TPS',NVD_Table)
 !read & write from a local table
```

See Also: FileName

TryFetch (get a value from the INI file)

TryFetch(*section, entry* **)**

TryFetch	Returns a value from the INI file.
section	A string constant, variable, EQUATE, or expression containing the INI file section name.
entry	A string constant, variable, EQUATE, or expression containing the INI file entry name.

The **TryFetch** method returns a value from the INI file. If the specified section and entry do not exist, TryFetch returns an empty string. This allows you to check the return value and take appropriate action when the INI file entry is missing.

Return Data Type: STRING

Example:

```
Color     BYTE
DefaultColor EQUATE(5)
 CODE
 Color=INIMgr.TryFetch('Preferences','Color')     !return 'Color', no default
 IF NOT Color
  Color=DefaultColor
 END
```

TryFetchField (return comma delimited INI file value)

TryFetchField(*section, entry, field* **)**

TryFetchField	Returns a comma delimited value from the INI file.
section	A string constant, variable, EQUATE, or expression containing the INI file section name.
entry	A string constant, variable, EQUATE, or expression containing the INI file entry name.
field	An integer constant, variable, EQUATE, or expression identifying the comma delimited value to return.

The **TryFetchField** method returns one of several comma delimited values from the INI file. If the specified section and entry do not exist, TryFetchField returns an empty string. This allows you to check the return value and take appropriate action when the INI file entry is missing.

TryFetchField assumes the *entry* value is a comma delimited string of the form V1,V2,...,Vn. A *field* value of one (1) returns the value prior to the first comma in the string; a value of two (2) returns the value between the first and second commas; a three (3) returns the value between the second and third commas, etc.

Return Data Type: STRING

Example:

```
Sound   STRING(3)
Volume   BYTE
  CODE
 Sound=INIMgr.TryFetchField('Preferences','Sound&Volume',1)
 !get Sound value
 IF NOT Sound                !if not present
  Sound='ON'                 !default to on
 END
 Volume=INIMgr.TryFetchField('Preferences','Sound&Volume',2)
!get Volume value
 IF NOT Volume               !if not present
  Volume=3                   !default to 3
 END
 !program code
 INIMgr.Update('Preferences','Sound&Volume', |  !create INI entry like
 CLIP(Sound)&','&Volume)                        !Sound&Volume=ON,3
```

Update (write INI file entries)

```
Update( section,  | entry, value                          |), VIRTUAL
                  | entry, value, filename                |
                  | window                       |
                  | entry, queue, field, [field], [field]  |
```

Update	Writes entries to the INI file.
section	A string constant, variable, EQUATE, or expression containing the INI file section name.
entry	A string constant, variable, EQUATE, or expression containing the INI file entry name.
value	A constant, variable, EQUATE, or expression containing the value to store for the *section* and *entry*.
filename	A string constant, variable, EQUATE, or expression containing the INI file name. If *filename* specifies a full path, the Update method looks for the file in the specified path. If no path is specified, the Update method looks for the file in the Windows directory. If *filename* is specified as null (''), the Fetch method uses the WIN.INI file.
window	The label of a WINDOW or APPLICATION whose position and size parameters the Update method stores.
queue	The label of a QUEUE.
field	The label of a FIELD within the QUEUE.

The **Update** method writes entries to the INI file. If the specified value is null (''), the existing entry is deleted.

Update(*section,entry,value*)
Writes a single value specified by *section* and *entry* to the INI file specified in the INIClass.FileName property.

Update(*section,entry,value,filename*)
Writes a single value specified by *section* and *entry* to the INI file specified by *filename*.

Update(*section,window*)
Writes several WINDOW position and size attributes to the INI file specified in the INIClass.FileName property, for retrieval by a subsequent corresponding call to Fetch(*section,window*). Restoring the values returns the specified WINDOW to its saved position and size.

Update(*queue*, *field,* [*field*], [*field*])
Writes the records of a QUEUE with a maximum of three fields to the INI file specified in the INIClass.FileName property.

Implementation: If a *window* is present, the Update method writes five entries to the specified INI file *section*: Maximize, XPos, YPos, Height, and Width. These entries are retrieved and applied by the Fetch method to restore the window's postion and size.

Example:

```
Sound   STRING('ON ')
PWindow  WINDOW('Preferences'),AT(,,89,34),IMM,MAX,RESIZE
          CHECK('&Sound'),AT(8,6),USE(Sound),VALUE('ON','OFF')
          BUTTON('OK'),AT(57,3,30,10),USE(?OK)
         END
 CODE
 OPEN(PWindow)
 INIMgr.Fetch('Preferences',PWindow)         !restore PWindow size & position
 INIMgr.Fetch('Preferences','Sound',Sound)   !get 'Sound' entry
 !program code
 INIMgr.Update('Preferences','Sound',Sound)  !save 'Sound' entry
 INIMgr.Update('Preferences','Sound',Sound,'MYAPP.INI') !save 'Sound' entry to INI
 INIMgr.Update('Preferences',PWindow)                   !save PWindow size & position
```

See Also: Fetch

IReportGenerator Interface

IReportGenerator Interface

IReportGenerator Concepts

The IReportGenerator interface is a defined set of commands that are implemented by various report output generators. This interface is not intended to be called by any code other than the WMFParser.

IReportGenerator Methods

AskProperties (pop up window to set properties)

AskProperties( ), BYTE

AskProperties Allow the user to set properties before printing.

The **AskProperties** method is used to pop up a window that allows a user to set properties defining how the output is to be generated. The **AskProperties** method returns one (1) if the OK button is pressed and printing will proceed. If the Cancel button is pressed, the **AskProperties** method returns zero (0) and printing will not proceed.

Return Data Type: BYTE

CloseDocument (end document printing)

CloseDocument( ), BYTE

CloseDocument Called after the document is printed, and returns an appropriate error level.

The **CloseDocument** method is used to detect any error level state that may exist after the document has been printed. **CloseDocument** returns Level:Benign if the document printed normally.

Implementation: Called immediately after the document has been printed.

Return Data Type: BYTE

ClosePage (end a page print)

ClosePage( ), BYTE

ClosePage Called after each page is printed to detect a possible error condition.

The **ClosePage** method is used to detect any error state that may exist after each page (WMF file) has been printed. **ClosePage** returns Level:Benign if the page printed successfully.

Implementation: Called immediately after each WMF page has been printed.

Return Data Type: BYTE

GetProperty (get a property value)

GetProperty (*property* **), STRING**

GetProperty	Returns the value of a specified property.
property	A string constant, variable, EQUATE, or expression containing a valid document property name.

The **GetProperty** method returns a value of the current document property. These properties are defined in the documentation for each ReportGenerator object (i.e., the HTML report generator contains a list of supported properties).

Return Data Type: STRING

Init (initialize error class before printing)

Init(ErrorClass EC)

Init	Initializes the ErrorClass object used to detect document errors..
EC	The name of the ErrorClass object used to report any errors encountered during report generation.

The **Init** method is used to initialize the ErrorClass object that is used with the ReportGenerator Class.

OpenDocument (begin document printing)

OpenDocument( ), BYTE

OpenDocument Called before the document is printed, and posts any error level code that may have occurred during initialization.

The **OpenDocument** method is used to detect any error state that may exist before the document has been printed. If the document is ready to print, **OpenDocument** returns a Level:Benign

Implementation: Called immediately before the document begins to print.

Return Data Type: BYTE

OpenPage (begin a page print)

OpenPage(*left***,** *top***,** *right***,** *bottom***,** *pagename***), BYTE**

OpenPage Called before each page is printed to detect if an error has occurred.

left,top
right,bottom A SHORT for each parameter identifying the respective boundaries of the page.

pagename A STRING variable or constant that identifies the name of the WMF file to be printed.

The **OpenPage** method is used to detect an error level state that may exist before each page (WMF file) has been printed. If the page is ready to be printed, **OpenPage** returns Level:Benign.

Implementation: Called immediately before each WMF page is printed.

Return Data Type: BYTE

Opened (file opened flag)

Opened BYTE

The **Opened** property indicates whether the DbLogFileManager's FILE (the log file) has been opened. A value of one (1 or True) indicates the FILE is open; a value of zero (0 or False) indicates the FILE is not opened.

ProcessArc (print an arc)

ProcessArc(*ArcFormatGrp *arc, comment* **)**

ProcessArc	Prints an ARC of an ellipse to a target output document.
arc	A TYPEd GROUP structure that holds all of the properties of the target arc graphic.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the arc of an ellipse to be properly rendered to the target document.

The **ProcessArc** method prints an arc of an ellipse to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *arc* group contains the position and style of the arc from the contents of the passed *ArcFormatGrp*.

See Also: ARC

ProcessBand (begin/end report band processing)

ProcessBand (*bandtype, position)*

ProcessBand	Processes each report band
bandtype	A string constant, variable, EQUATE, or expression containing the type of band to process. Valid band types are HEADER, FOOTER, DETAIL, BREAK and FORM.
position	A BYTE, variable, EQUATE, or expression that identifies the start or end of the band.

The **ProcessBand** method is used to process all report bands and redirect to an alternative document where appropriate If the position attribute is TRUE (1), the start of each band is processed. If the position attribute is FALSE (0), the start of each band is processed.

ProcessCheck (print a checkbox)

ProcessCheck(*CheckFormatGrp *check, text, comment* **)**

ProcessCheck	Prints a CHECK control to the output document.
check	A TYPEd GROUP that holds all of the properties of the target check box.
text	A string constant, variable, EQUATE, or expression containing the check box prompt contents.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the check box to be properly rendered to the target document.

The **ProcessCheck** method prints a check box to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *check* group contains the position, style, text, and check box state from the contents of the passed CheckFormatGrp.

ProcessChord (print a section of an ellipse)

ProcessChord(*ChordFormatGrp chord, comment* **)**

ProcessChord	Prints a section of an ellipse to a target output document.
chord	A TYPEd GROUP structure that holds all of the properties of the target chord graphic.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the section of an ellipse to be properly rendered to the target document.

The **ProcessChord** method prints a section of an ellipse to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *chord* group contains the position and style of the chord from the contents of the passed *ChordFormatGrp*.

See Also: CHORD

ProcessEllipse (print an ellipse)

ProcessEllipse(*EllipseFormatGrp *ellipse, comment* **)**

ProcessEllipse	Prints an ELLIPSE control to a target output document.
ellipse	A TYPEd GROUP structure that holds all of the properties of the target ellipse control.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the ellipse to be properly rendered to the target document.

The **ProcessEllipse** method prints an ellipse control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *ellipse* group contains the position and style of the ellipse control from the contents of the passed *EllipseFormatGrp*.

ProcessImage (print an image)

ProcessImage (*ImageFormatGrp *image, iName, comment* **)**

ProcessImage	Prints an IMAGE control to a target output document.
image	A TYPEd GROUP structure that holds all of the properties of the target image control.
iname	A string constant, variable, EQUATE, or expression containing the file name containing the image to be printed.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the image to be properly rendered to the target document.

The **ProcessImage** method prints an image control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *image* group contains the position and stretch mode (centered, tiled, stretched) of the image control from the contents of the passed *ImageFormatGrp*.

ProcessLine (print a line)

ProcessLine (*LineFormatGrp *line, comment* **)**

ProcessLine	Prints a LINE control to a target output document.
line	A TYPEd GROUP structure that holds all of the properties of the target LINE control.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the LINE to be properly rendered to the target document.

The **ProcessLine** method prints a LINE control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *name* parameter accepts up to 1024 characters.

ProcessOption (print an option control)

ProcessOption (*OptionFormatGrp *option, text, comment* **)**

ProcessOption	Prints an OPTION control to a target output document.
option	A TYPEd GROUP structure that holds all of the properties of the target OPTION control.
text	A string constant, variable, EQUATE, or expression containing the OPTION text contents.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the OPTION to be properly rendered to the target document.

The **ProcessOption** method prints an option control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *option* group contains the position and other atrributes of the option control from the contents of the passed *OptionFormatGrp*.

ProcessRadio (print a radio button)

ProcessRadio (*RadioFormatGrp *radio, text, comment* **)**

ProcessRadio	Prints a RADIO control to a target output document.
radio	A TYPEd GROUP structure that holds all of the properties of the target RADIO control.
text	A string constant, variable, EQUATE, or expression containing the RADIO text contents.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the RADIO to be properly rendered to the target document.

The **ProcessRadio** method prints a RADIO control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *radio* group contains the contents, position (outer, inner) and radio state of the radio control from the contents of the passed *RadioFormatGrp*.

ProcessRectangle (print a box control)

ProcessRectangle (*RectFormatGrp *rect, comment* **)**

ProcessRectangle	Prints a BOX control to a target output document.
rect	A TYPEd GROUP structure that holds all of the properties of the target BOX control.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the BOX to be properly rendered to the target document.

The **ProcessRectangle** method prints a BOX control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *rect* group contains the position, style, and other attributes of the BOX control from the contents of the passed *RectFormatGrp*.

ProcessString (print a string control)

ProcessString (*StringFormatGrp str*grp, text, comment* **)**

ProcessString	Prints a STRING control to a target output document.
strgrp	A TYPEd GROUP structure that holds all of the properties of the target STRING control.
text	A string constant, variable, EQUATE, or expression containing the STRING contents.
comment	A string constant, variable, EQUATE, or expression containing information necessary for the STRING control to be properly rendered to the target document.

The **ProcessString** method prints a STRING control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: The *strgrp* group contains the position, alignment, styles, character set and other attributes of a STRING control from the contents of the passed *StringFormatGrp*.

ProcessText (print a text control)

ProcessText (TextFormatQueue txtque*, comment* **)**

ProcessText	Prints a TEXT control to a target output document.
txtque	A QUEUE structure that holds all of the properties of each line of the target TEXT control, and its contents.
comment	A string constant, variable, EQUATE, or expression containing information necessary for each line of the TEXT control to be properly rendered to the target document.

The **ProcessText** method prints a TEXT control to the appropriate document format. The *comment* parameter is used to send the appropriate formatting information to the target document type, and is limited to 2056 characters. (See COMMENT)

Implementation: Each *txtque* QUEUE entry contains the position, alignment, styles, character set and other attributes of the TEXT control.

SetProperty (set a property value)

SetProperty (*property* , *value* **), STRING**

SetProperty	Sets the value of a specified property.
property	A string constant, variable, EQUATE, or expression containing a valid document property name.
value	A string constant, variable, EQUATE, or expression containing a value for the specified property name.

The **SetProperty** method sets a value of the named document *property*. These properties are defined in the documentation for each ReportGenerator object (i.e., the HTML report generator contains a list of supported properties).

WhoAmI (identify the report generator type)

WhoAmI ( ), STRING

WhoAmI Identifies the type of report generator.

The **WhoAmI** method returns a string used to identify the type of report generator. For example, the HTML report generator returns 'HTML'.

Implementation: Returns the value of the *IAm* property initialized in the ReportGenerator object's constructor.

Return Data Type: STRING

LocatorClass

LocatorClass Overview

The LocatorClass is an abstract class--it is not useful by itself. However, other useful classes are derived from it and other structures (such as the BrowseClass) use it to reference its derived classes.

LocatorClass Concepts

The classes derived from LocatorClass let you specify a locator control and a sort field on which to search for each sort order of a BrowseClass object. These LocatorClass objects help the BrowseClass locate and scroll to the requested items.

LocatorClass objects implement some of the common variations in locator controls (none, STRING, ENTRY), locator invocation (keystroke, ENTER key, TAB key), and search methods (single character search starting from current item, incremental character, exclusive search) that occur in the browse context.

LocatorClass Relationship to Other Application Builder Classes

The BrowseClass optionally uses the classes derived from the LocatorClass. Therefore, if your BrowseClass objects use a locator, then your program must instantiate a LocatorClass for each use.

The StepLocatorClass, EntryLocatorClass, IncrementalLocatorClass,and FilterLocatorClass are all derived (directly or indirectly) from the LocatorClass. Each of these derived classes provides slightly different search behaviors and characteristics.

Step Locator
: Use a Step Locator when the search field is a STRING, CSTRING, or PSTRING, a single character search is sufficient (a step locator is not appropriate when there are many key values that begin with the same character), and you want the search to take place immediately upon the end user's keystroke. Step Locators are not appropriate for numeric keys.

Entry Locator
: Use an Entry Locator when you want a multi-character search (more precise) on numeric or alphanumeric keys and you want to delay the search until the user accepts the locator control. The delayed search reduces network traffic and provides a smoother search in a client-server environment.

ncremental Locator

Use an Incremental locator when you want a multi-character search (more precise) on numeric or alphanumeric keys and you want the search to take place immediately upon the end user's keystroke.

Filter Locator

Use a Filter Locator when you want a multi-character search (more precise) on alphanumeric keys and you want to *minimize network traffic*.

LocatorClass ABC Template Implementation

Because the LocatorClass is abstract, the ABC Template generated code does not directly reference the LocatorClass.

LocatorClass Source Files

The LocatorClass source code is installed by default to the Clarion \LIBSRC folder. The LocatorClass source code and its respective components are contained in:

ABBROWSE.INC	LocatorClass declarations
ABBROWSE.CLW	LocatorClass method definitions

LocatorClass Properties

The LocatorClass has the several properties described below. These properties are inherited by classes derived from the LocatorClass.

Control (the locator control number)

Control SIGNED

The **Control** property contains the locator control number if there is a locator control. If there is no locator control, it contains zero (0). The LocatorClass uses the Control property to refresh the control or change its properties.

The Init method sets the value of the Control property.

See Also: Init

FreeElement (the locator's first free key element)

FreeElement ANY

The **FreeElement** property contains a reference to a component of the sort sequence of the searched data set. The ABC Templates further require this to be a free component of a key. A free component is one that is not range limited to a single value. Typically this is also the USE variable of the locator control. The LocatorClass uses the FreeElement property to prime the free component with the appropriate search value.

The Init method sets the value of the FreeElement property.

See Also: Init

NoCase (case sensitivity flag)

NoCase BYTE

The **NoCase** property determines whether the LocatorClass object performs case sensitive searches or case insensitive searches.

The Init method sets the value of the NoCase property.

Implementation: If NoCase contains a non-zero value, the search is not case sensitive. That is, searches for "Tx," "tx," or "TX" all produce the same result. If NoCase contains a value of zero (0), the search is case sensitive.

See Also: Init

ViewManager (the locator's ViewManager object)

ViewManager &BrowseClass

The **ViewManager** property is a reference to the BrowseClass object that the LocatorClass object is working for. See *ViewManager* and *BrowseClass* for more information. The LocatorClass uses this property to manipulate the searched data set as well as the displayed LIST.

The Init method sets the value of the ViewManager property.

See Also: Init

LocatorClass Methods

The LocatorClass contains the following methods.

GetShadow(return shadow value)

GetShadow, VIRTUAL

GetShadow Is a virtual placeholder method for the EntryLocatorClass.SetShadow method.

The **GetShadow** method returns the value of the Shadow property found in the child CLASS. The Shadow property is set based on the users keyboard input into the entry locator field.

Implementation: The GetShadow method is a placeholder method for the EntryLocatorClass which is derived from LocatorClass.

Return Data Type: STRING

See Also: LocatorClass.SetShadow, EntryLocatorClass.Shadow

Init (initialize the LocatorClass object)

Init([*control*] *, freeelement, nocase* [*,browseclass*] **)**

Init	Initializes the LocatorClass object.
control	An integer constant, variable, EQUATE, or expression that sets the locator control number for the LocatorClass object. If omitted, the control number defaults to zero (0) indicating there is no locator control.
freeelement	The fully qualified label of a component of the sort sequence of the searched data set. The ABC Templates further require this to be a free component of a key. A free component is one that is not range limited to a single value. Typically this is also the USE variable of the locator control.
nocase	An integer constant, variable, EQUATE, or expression that determines whether the LocatorClass object performs case sensitive searches or case insensitive searches.
browseclass	The label of the BrowseClass object for the locator. If omitted, the LocatorClass object has no direct access to the browse QUEUE or it's underlying VIEW.

The **Init** method initializes the LocatorClass object.

Implementation: The Init method sets the values of the Control, FreeElement, NoCase, and ViewManager properties.

A *nocase* value of zero (0 or False) produces case sensitive searches; a value of one (1 or True) produces case insensitive searches.

By default, only the StepLocatorClass and FilterLocatorClass use the *browseclass*. The other locator classes do not.

Example:

```
BRW1::Sort1:Locator.Init(,CUST:StateCode,1)         !without locator control
BRW1::Sort2:Locator.Init(?CUST:CustMo,CUST:CustNo,1)!with locator control
```

See Also: Control, FreeElement, NoCase, ViewManager

Reset (reset the locator for next search)

Reset, VIRTUAL

The **Reset** method is a virtual placeholder method to reset the locator for the next search.

Implementation: The BrowseClass.TakeAcceptedLocator method calls the Reset method.

Example:

```
BrowseClass.TakeAcceptedLocator PROCEDURE     !process an accepted locator entry
 CODE
 IF ~SELF.Sort.Locator &= NULL AND ACCEPTED() = SELF.Sort.Locator.Control
  IF SELF.Sort.Locator.TakeAccepted()         !call locator take accepted method
   SELF.Reset(1)                              !if search needed, reset the view
   SELECT(SELF.ListControl)                   !focus on the browse list control
   SELF.ResetQueue( Reset:Done )              !reload the browse queue
   SELF.Sort.Locator.Reset                    !reset the locator
   SELF.UpdateWindow                          !update (redraw) the window
  END
 END
```

See Also: BrowseClass.TakeAcceptedLocator

Set (restart the locator:LocatorClass)

Set, VIRTUAL

The **Set** method prepares the locator for a new search.

Implementation: The Set method clears the FreeElement property.

Example:

```
MyBrowseClass.TakeScroll PROCEDURE( SIGNED Event )
 CODE
 CASE Event
 OF Event:ScrollUp OROF Event:ScrollDown
  SELF.ScrollOne( Event )
 OF Event:PageUp OROF Event:PageDown
  SELF.ScrollPage( Event )
 OF Event:ScrollTop OROF Event:ScrollBottom
  SELF.ScrollEnd( Event )
 END                                    !after a scroll event
 IF ~SELF.Sort.Locator &= NULL THEN     !if locator is present
  SELF.Sort.Locator.Set                 !set it to blank
 END
```

SetAlerts (alert keystrokes for the LIST control:LocatorClass)

SetAlerts(*control* **), VIRTUAL**

SetAlerts	Alerts appropriate keystrokes for the specified control.
control	An integer constant, variable, EQUATE, or expression containing the control number of the control displaying the data to search.

The **SetAlerts** method alerts appropriate keystrokes for the specified control, typically a LIST or COMBO.

The SetAlerts method is a placeholder method for classes derived from LocatorClass--IncrementalLocatorClass, etc.

See Also: IncrementalLocatorClass.SetAlerts

SetEnabled (enable or disable the locator control)

SetEnabled(*enabled* **)**

SetEnabled	Enables or disables the locator control.
enabled	An integer constant, variable, EQUATE, or expression that enables or disables the locator control. A value of zero (0 or False) disables the control; a value of one (1 or True) enables the control.

The **SetEnabled** method enables or disables the locator control for this LocatorClass object. See *ENABLE* and *DISABLE* in the *Language Reference*.

Example:

```
MyBrowseClass.Enable PROCEDURE
 CODE
 IF ~SELF.Sort.Locator &= NULL                          !if locator is present
  SELF.Sort.Locator.SetEnabled(RECORDS(SELF.ListQueue)) !disable locator if 0 items
 END
```

SetShadow (update shadow value)

SetShadow(*value* **),VIRTUAL**

SetShadow	Is a virtual placeholder method for the EntryLocatorClass.SetShadow method.
value	A string constant, variable, EQUATE, or expression that is assigned to the Shadow property.

The **SetShadow** method places a value in the EntryLocatorClass.Shadow property.

See Also: EntryLocatorClass.SetShadow, EntryLocatorClass.Shadow

TakeAccepted (process an accepted locator value:LocatorClass)

TakeAccepted, VIRTUAL

The **TakeAccepted** method processes the accepted locator value and returns a value indicating whether the browse list display must change. The TakeAccepted method is only a placeholder method for classes derived from LocatorClass--EntryLocatorClass, FilterLocatorClass, etc.

This method is only appropriate for LocatorClass objects with locator controls that accept user input; for example, entry controls, combo controls, or spin controls.

A locator value is accepted when the end user changes the locator value, then TABS off the locator control or otherwise switches focus to another control on the same window.

Return Data Type: BYTE

See Also: EntryLocatorClass.TakeAccepted, FilterLocatorClass.TakeAccepted

TakeKey (process an alerted keystroke:LocatorClass)

TakeKey, VIRTUAL

The **TakeKey** method processes an alerted keystroke for the LIST control and returns a value indicating whether the browse list display must change.

Tip: By default, all alphanumeric keys are alerted for LIST controls.

The TakeKey method is only a placeholder method for classes derived from LocatorClass--StepLocatorClass, EntryLocatorClass, IncrementalLocatorClass, etc.

Return Data Type: BYTE

See Also: StepLocatorClass.TakeKey, EntryLocatorClass.TakeKey, IncrementalLocatorClass.TakeKey

UpdateWindow (redraw the locator control with its current value)

UpdateWindow, VIRTUAL

The **UpdateWindow** method redraws the locator control with its current value.

The UpdateWindow method is only a placeholder method for classes derived from LocatorClass--EntryLocatorClass, FilterLocatorClass, etc.

See Also: EntryLocatorClass.UpdateWindow, FilterLocatorClass.UpdateWindow

MsgBoxClass

MsgBoxClass Overview

The MsgBoxClass provides a message window to the ErrorClass. This class manages the display of the current error.

MsgBoxClass Source Files

The MsgBoxClass source code is installed by default to the Clarion \LIBSRC. The specific MsgBoxClass source code and their respective components are contained in:

ABERROR.INC	MsgBoxClass declarations
ABERROR.CLW	MsgBoxClass method definitions
ABERROR.TRN	MsgBoxClass default error definitions

MsgBoxClass Properties

The The MsgBoxClass inherits all the properties of the WindowManager class from which it is derived. In addition to the inherited properties, the MsgBoxClass contains the following properties:

ButtonTypes (standard windows buttons)

ButtonTypes LONG, PROTECTED

The **ButtonTypes** property is used to indicate which Windows standard buttons to place on the message box dialog. This may indicate multiple buttons.

Caption (window title)

Caption &STRING, PROTECTED

The **Caption** property is a string that specifies the message box window caption.

Err (errorclass object)

Err &ErrorClass, PROTECTED

The **Err** property is a reference to the ErrorClass object.

Icon (icon for image control)

Icon LONG, PROTECTED

The **Icon** property is a long value that specifies the icon to use on the message box window.

HistoryHandler (windowcomponent interface)

HistoryHandler **&WindowComponent**

The **HistoryHandler** property is a reference to the WindowComponent interface.

MsgRVal (message box return value)

MsgRVal **LONG**

The **MsgRVal** property is a long value that is the return value from the message box. The MsgBox.Init method sets this property to the Default window button.

Style (font style)

Style **LONG, PROTECTED**

The **Style** property indicates the font style to use withing the lixt control on the message box dialog.

Win (reference to window)

Win **&Window, PROTECTED**

The **Win** property is a reference to the message box window.

MsgBoxClass Methods

The MsgBoxClass inherits all the methods of the WindowManager from which it is derived. In addition to the inherited methods, the MsgBoxClass contains the methods listed below.

FetchFeq (retrieve button feq)

FetchFeq(*btn* **), VIRTUAL**

FetchFeq	Retrieve button FEQ.
btn	An integer constant, variable, EQUATE, or expression that indicates the button number.

The **FetchFeq** method determines the FEQ for the specified button number.

Return Data Value: SHORT

FetchStdButton (determine button pressed)

FetchStdButton(feq)

The **FetchStdButton** determines which of the windows standard buttons was pressed. The FEQ of the button is returned.

Return Data Value: BYTE

Init (initialize the MsgBoxClass object)

Init, PROC, DERIVED
Init(*win***,** *err***,** [*caption*], *icon*, [*buttons*],*default button*, *style***)**

Init	Initialize the MsgBoxClass object.
win	Reference to the MsgBox window.
err	Reference to the ErrorClass object.
caption	A string constant, variable, EQUATE, or expression that specifies the message box window caption.
icon	An integer constant, variable, EQUATE, or expression that indicates the icon to display on the message box.
buttons	An integer constant, variable, EQUATE, or expression that indicates which Windows standard buttons to place on the message box. This may indicate multiple buttons. If omitted this is equivalent to Button:OK.
default button	An integer constant, variable, EQUATE, or expression that indicates the default button on the message box.
style	An integer constant, variable, EQUATE, or expression that indicates the font style to use withing the lixt control on the message box dialog.

The **Init** method initializes the MsgBoClass object.

Return Data Type: BYTE

Kill (perform any necessary termination code)

Kill

The **Kill** method disposes any memory allocated during the object's lifetime and performs any other necessary termination code.

SetupAdditionalFeqs (initialize additional control properties)

SetupAdditionalFeqs, VIRTUAL, PROTECTED

The **SetupAdditionalFeqs** method initializes additional properties for the controls on the window.

TakeAccepted (process accepted event)

TakeAccepted, PROC, DERIVED

The **TakeAccepted** method processes EVENT:Accepted events for the message box dialog's controls, and returns a value indicating whether ACCEPT loop processing is complete and should stop. TakeAccepted returns Level:Fatal to indicate a standard button on the dialog was pressed and ACCEPT loop should BREAK.

Return Data Type: BYTE

PopupClass

PopupClass Overview

The PopupClass object defines and manages a full featured popup (context) menu. The PopupClass object makes it easy to add fully functional popup menus to your procedures.

PopupClass Concepts

You can set the popup menu items to mimic existing buttons on a window, so that associated menu item text matches the *button* text, is enabled only when the *button* is enabled, and, when selected, invokes the *button* action.

Alternatively, you can set the popup menu item to POST a particular event or simply return its ID so you can trap it and custom code the item's functionality.

PopupClass Relationship to Other Application Builder Classes

The PopupClass optionally uses the TranslatorClass so you can translate menu text to other languages without changing your popup menu code. The PopupClass optionally uses the INIClass to save and restore menu definitions to a configuration (.INI) file. Neither class is required by the PopupClass; however, if you use either facility, you must instantiate them in your program. See the Conceptual Example.

The ASCIIViewerClass, BrowseClass, and PrintPreviewClass all use the PopupClass to manage their popup menus. This PopupClass use is automatic when you INCLUDE the class header (ABASCII.INC, ABBROWSE.INC, or ABPRINT.INC) in your program's data section.

PopupClass ABC Template Implementation

The ABC Templates declare a local PopupClass class *and* object for each instance of the Popup code template.

The class is named PopupMgr# where # is the instance number of the Popup code template. The templates provide the derived class so you can use the Popup code template **Classes** tab to easily modify the popup menu behavior on an instance-by-instance basis.

The template generated code does not reference the PopupClass objects encapsulated within the ASCIIViewerClass, BrowseClass, and PrintPreviewClass.

PopupClass Source Files

The PopupClass source code is installed by default to the Clarion \LIBSRC folder. The PopupClass source code and its respective components are contained in:

ABPOPUP.INC	PopupClass declarations
ABPOPUP.CLW	PopupClass method definitions
ABPOPUP.TRN	PopupClass translation strings

PopupClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a PopupClass object.

This example displays a dialog with a right-click popup menu that mimics the dialog buttons with three different PopupClass techniques. The dialog buttons demonstrate the PopupClass' ability to save and restore menus to and from an INI file.

```
  PROGRAM
  MAP
  END
  INCLUDE('ABPOPUP.INC')               !declare PopupClass
  INCLUDE('ABUTIL.INC')                !declare INIClass & Translator
  INCLUDE('KEYCODES.CLW')              !declare right-click EQUATE

PopupString  STRING(20)                !to receive menu selection
PopupMgr   PopupClass                  !declare PopupMgr object
Translator  TranslatorClass            !declare Translator object
INIMgr    INIClass                     !declare INIMgr object
INIFile    EQUATE('.\Popup.ini')       !declare INI pathname EQUATE

PopupWin WINDOW('Popup Demo'),AT(,,184,50),ALRT(MouseRight),GRAY
          BUTTON('&Save Popup'),AT(17,16),USE(?Save)
          BUTTON('&Restore Popup'),AT(74,16),USE(?Restore),DISABLE
          BUTTON('Close'),AT(140,16),USE(?Close)
         END
 CODE
 OPEN(PopupWin)
  Translator.Init                      !initialize Translator object
 INIMgr.Init(INIFile)                  !initialize INIMgr object
 PopupMgr.Init(INIMgr)                 !initialize PopupMgr object
 PopupMgr.AddItemMimic('Save',?Save)   !Save item mimics ?Save button
 PopupMgr.AddItem('Restore Popup','Restore')       !add menu item: Restore
 PopupMgr.SetItemEnable('Restore',False)           !initially disable Restore item
 PopupMgr.AddItem('-','Separator1')                !add a menu item separator
 PopupMgr.AddItem('Disable Save','Disable')        !add a menu item: Disable
 PopupMgr.AddItem('-','Separator2')                !add a menu item separator
 PopupMgr.AddItem('Close (EVENT:Accepted)','Close')!add a menu item: Close
 PopupMgr.AddItemEvent('Close',EVENT:Accepted,?Close)!Close POSTs event to a control
 PopupMgr.AddItem('Close (EVENT:CloseWindow)','Close2')!add a menu item: Close2
 PopupMgr.AddItemEvent('Close2',EVENT:CloseWindow,0) !Close2 POSTs independent event
 PopupMgr.SetTranslator(Translator)                !enable popup text translation

 ACCEPT
  CASE EVENT()
  OF EVENT:AlertKey                    !trap for alerted keys
   IF KEYCODE() = MouseRight           !if right-click
```

```
    PopupString=PopupMgr.Ask()          !display popup menu
    CASE PopupString                    !check for selected item
    OF 'Disable'                        !if Disable item selected
     IF PopupMgr.GetItemChecked('Disable')
      PopupMgr.SetItemCheck('Disable',False)   !toggle the menu check mark
      ENABLE(?Save)                     !toggle ?Save button state
     ELSE                               !which automatically toggles
      PopupMgr.SetItemCheck('Disable',True)    !the Save menu item, because
      DISABLE(?Save)                    !it mimics the ?Save button
     END
    OF 'Restore'                        !if Restore item selected
     POST(EVENT:Accepted,?Restore)       !code your own functionality
    ELSE                                !if any other item selected
    END                                 !Ask automatically handled it
   END
  END
  CASE FIELD()
  OF ?Save                              !Save button mimiced by Save item
   CASE EVENT()
   OF EVENT:Accepted
    PopupMgr.Save('MyPopup')            !save menu definition to INI
    RUN('NotePad '&INIFile)             !display/edit menu definition
    ENABLE(?Restore)                    !enable the Restore button
    PopupMgr.SetItemEnable('Restore',True)    !enable the Restore item
   END
  OF ?Restore
   CASE EVENT()
   OF EVENT:Accepted
    PopupMgr.Restore('MyPopup')         !restore/define menu from INI
   END
  OF ?Close                             !Close btn Accepted by Close item
   CASE EVENT()
   OF EVENT:Accepted
    POST(Event:CloseWindow)
                  END
 END
END
PopupMgr.Kill
```

PopupClass Properties

The PopupClass contains the properties described below.

ClearKeycode (clear KEYCODE character)

ClearKeycode BYTE

The **ClearKeycode** property determines whether the PopupClass object clears the (MouseRight) value from the KEYCODE() "buffer" before invoking the selected menu item's action. A value of one (1 or True) sets the KEYCODE() "buffer" to zero; a value of zero (0 or False) leaves the KEYCODE() "buffer" intact. See *KEYCODE* and *SETKEYCODE* in the *Language Reference* for more information.

Tip: The uncleared KEYCODE() value can cause the popup menu to reappear in some circumstances; therefore we recommend setting the ClearKeycode property to True.

Implementation: The ABC Templates set the ClearKeycode property to True by default. The Ask method implements the action specified by the ClearKeycode property.

See Also: Ask, Init

PopupClass Methods

The PopupClass contains the methods listed below.

PopupClass Functional Organization--Expected Use

As an aid to understanding the PopupClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the PopupClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the PopupClass object
AddMenu	add a menu
AddItem	add menu item
AddItemEvent	set menu item action
AddItemMimic	tie menu item to a button
AddSubMenu	add submenu
Kill	shut down the PopupClass object

Mainstream Use:

Ask	display and process the popup menu
GetItemChecked	return toggle item status
GetItemEnabled	return item status
SetItemCheck	set toggle item status
SetItemEnable	set item status

Occasional Use:

DeleteItem	remove menu item
GetLastSelection	return last selected item
SetTranslator	set run-time translator
Save	save a menu for restoration
SetLevel	set menu item hierarchy level
SetText	set menu item text
Restore	restore a saved menu

Virtual Methods

The PopupClass has no virtual methods.

AddItem (add menu item)

AddItem(*text* | [,*name*] | **)**

| *name, position, level* |

AddItem	Adds an item to the popup menu.
text	A string constant, variable, EQUATE, or expression containing the text of the menu item. A single hyphen (-) creates a non-selectable separator (a 3D horizontal bar) on the menu. An ampersand (&) designates the next character as the menu item's hot key.
name	A string constant, variable, EQUATE, or expression containing the menu item name. Other PopupClass methods refer to the menu item by its *name*, not by its *text*. This lets you apply runtime translation or dynamic reordering of menus without changing your code. If omitted, AddItem derives the *name* from the *text*.
position	A string constant, variable, EQUATE, or expression containing the name after which to add the new menu item.
level	An integer constant, variable, EQUATE, or expression containing the nesting level or depth of the new menu item.

The **AddItem** method adds an item to the popup menu.

You set the action taken for each menu item with the AddItemMimic or AddItemEvent methods, or with your own custom code. These methods (and your code) must refer to the menu items by name (not by text).

AddItem(*text*)
: Adds a single menu item at the end of the menu. The item name is derived.

AddItem(*text, name*)
: Adds a single menu item at the end of the menu with the name specified.

AddItem(*text, name, position, level*)
: Adds a single menu item following item *position*, at level *level*, with name specified.

Implementation: The *text* and *name* parameters accept up to 1024 characters.

Each derived menu item name is the same as its *text* minus any special characters. That is, the name contains only characters 'A-Z', 'a-z', and '0-9'. If the resulting name is not unique, the PopupClass appends a sequence number to the name to make it unique.

Example:

```
PopupMgr.AddItem('Save Popup')                          !add menu item named SavePopup
PopupMgr.AddItem('Save Popup','Save')                   !add menu item named Save
PopupMgr.AddItem('-','Separator')                       !add a separator
PopupMgr.AddItem('Restore Popup','Restore','Save',1)!add Restore item after Save item
```

See Also: AddItemEvent, AddItemMimic, SetText

AddItemEvent (set menu item action)

AddItemEvent(*name, event* [,*control*] **), PROC**

AddItemEvent Associates an event with a menu item.

name A string constant, variable, EQUATE, or expression containing the name of the menu item associated with the *event*. If the named item does not exist, AddItemEvent adds it at the bottom of the popup menu.

event An integer constant, variable, EQUATE, or expression containing the event number to POST when the end user selects the menu item.

control An integer constant, variable, EQUATE, or expression containing the control number to POST the *event* to when the end user selects the menu item. To post a field-independent event, use a *control* value of zero (0). If omitted, *control* defaults to zero (0).

The **AddItemEvent** method associates an *event* with a menu item and returns the name of the item. When the end user selects the menu item, the PopupClass object POSTs the *event* to the *control*.

Implementation: The Ask method traps the selected item and POSTs the *event*.

The *name* parameter accepts up to 1024 characters.

Return Data Type: STRING

Example:

```
PopupMgr.AddItem('Close (control event)','Close')   !add a menu item: Close
PopupMgr.AddItemEvent('Close',EVENT:Accepted,?Close)!Close POSTs event to a control
PopupMgr.AddItem('Close (window event)','Close2')   !add a menu item: Close2
PopupMgr.AddItemEvent('Close2',EVENT:CloseWindow,0) !Close2 POSTs independent event
```

See Also: AddItem, AddItemMimic, AddMenu, Ask

AddItemMimic (tie menu item to a button)

AddItemMimic(*name, button* [, *text*] **), PROC**

AddItemMimic Associates a menu item with a BUTTON.

name A string constant, variable, EQUATE, or expression containing the menu item name to associate with the *button*. If the named item does not exist, AddItemMimic adds it at the bottom of the popup menu. To add a new item, the *button* must have text, or you must supply the *text* parameter.

button A numeric constant, variable, EQUATE, or expression containing the associated BUTTON's control number. If the button has no text, you should supply the *text* parameter.

text A string constant, variable, EQUATE, or expression containing the text of the menu item. Other PopupClass methods refer to the menu item by its *name*, not by its *text*. This lets you apply runtime translation or dynamic reordering of menus without changing your code. If omitted, AddItemMimic uses the button text as the text of the menu item.

The **AddItemMimic** method associates a menu item with a *button* and returns the name of the item. AddItemMimic can add a *new* menu item, or add an *association* to an *existing* menu item. The associated menu item text matches the *button* text, is enabled only when the *button* is enabled, and, when selected, invokes the *button* action.

Implementation: The Ask method traps the selected item and POSTs an EVENT:Accepted to the *button*.

If *button* does not represent a BUTTON, AddItemMimic does nothing.

The *text* and *name* parameters accept up to 1024 characters.

Return Data Type: STRING

Example:

```
PopupMgr.AddItem('Save Popup','Save')      !add menu item: Save
PopupMgr.AddItemMimic('Save',?Save)        !Save item mimics ?Save button
PopupMgr.AddItemMimic('Insert',?Insert)    !add Insert item & mimic ?Insert button
```

See Also: AddItem, AddMenu, Ask, SetText

AddMenu (add a menu)

AddMenu(*selections* [*, position*] **)**

AddMenu	Adds a popup menu.
selections	A string constant, variable, EQUATE, or expression containing the text for the popup menu choices.
position	An integer constant, variable, EQUATE, or expression containing the position within the PopupClass' existing menu at which to add the *selections*. If omitted or zero (0), AddMenu clears any existing menu selections.

The **AddMenu** method adds an entire popup menu or adds additional selections to an existing menu. The AddMenu method creates a popup menu item with a unique name for each text specified by the *selections* parameter. The *selections* parameter is identical to the *selections* parameter for the POPUP command. See *POPUP* in the *Language Reference* for more information.

You set the action taken for each menu item with the AddItemMimic or AddItemEvent methods, or with your own custom code. These methods (and your code) must refer to the menu items by name (not by text).

Implementation: The AddMenu method optionally replaces any previously defined menu for this PopupClass object. The Ask method displays the popup menu and returns the selected item's name.

The Popup class object derives the menu item name from its text. Each derived item name is the same as its text minus any special characters. That is, the name contains only characters 'A-Z', 'a-z', and '0-9'. If the resulting name is not unique, the PopupClass appends a sequence number to the name to make it unique.

The *selections* parameter accepts up to 10,000 characters.

Example:

```
MenuChoices EQUATE('&Save Menu|&Restore Menu|-|&Close')!declare menu definition string
 CODE
 PopupMgr.AddMenu(MenuChoices)                          !add Popup menu
 PopupMgr.AddItemMimic('SaveMenu',?Save)                !SaveMenu mimics ?Save button
 PopupMgr.AddItemEvent('Close',EVENT:Accepted,?Close)   !Close POSTs event to a control
 !program code
  IF PopupMgr.Ask() = 'RestoreMenu'                     !if RestoreMenu item selected
   PopupMgr.Restore('MyMenu')                           !code your own functionality
  ELSE                                                  !if any other item selected
  END                                                   !Ask automatically handled it
```

See Also: AddItemEvent, AddItemMimic, Ask

AddSubMenu (add submenu)

AddSubMenu([*text*] *,selections, name to follow* **)**

AddSubMenu Adds a submenu to an existing menu.

text A string constant, variable, EQUATE, or expression containing the submenu text. If omitted, the submenu text must be prepended to the *selections* parameter.

selections A string constant, variable, EQUATE, or expression containing the text for the submenu items. The submenu items must be preceded by a double open curly brace ({{) and followed by a single close curly brace (}).

name to follow A string constant, variable, EQUATE, or expression containing the menu name or item name after which to insert the submenu.

The **AddSubMenu** method adds a submenu to an existing menu. The AddSubMenu method adds a submenu and its items, including a unique name for each item specified by the *selections* parameter. The *selections* parameter is identical to the submenu section of the *selections* parameter for the POPUP command. See *POPUP* in the *Language Reference* for more information. Set the action taken for each menu item with the AddItemMimic or AddItemEvent methods, or with your own custom code. These methods (and your code) must refer to the menu items by name (not by text).

Implementation: The Ask method displays the popup menu and returns the selected item's name.

The Popup class object derives the menu item name from its text. Each derived item name is the same as its text minus any special characters. That is, the name contains only characters 'A-Z', 'a-z', and '0-9'. If the resulting name is not unique, the PopupClass appends a sequence number to the name to make it unique. The *text* parameter accepts up to 1,024 characters; the *selections* parameter accepts up to 10,000 characters.

Example:

```
MenuChoices EQUATE('&Insert|&Change|&Delete')   !declare menu definition string
SubChoices EQUATE('{{by &name|by &ZIP code}')   !declare submenu definition
 CODE
 PopupMgr.AddMenu(MenuChoices)             !add Popup menu
 PopupMgr.AddSubMenu('&Print',SubChoices,'Delete')!add Print submenu after delete
 CASE PopupMgr.Ask()                       !display popup menu
  OF ('Insert')   ;DO Update(1)            !process end user choice
  OF ('Change')   ;DO Update(2)            !process end user choice
  OF ('Delete')   ;DO Update(3)            !process end user choice
  OF ('byname')   ;DO PrintByName          !process end user choice
  OF ('byZIPcode')  ;DO PrintByZIP         !process end user choice
 END
```

See Also: AddItemEvent, AddItemMimic, AddMenu, Ask

Ask (display the popup menu)

Ask([*x*] [,*y*] **), PROC**

Ask	Returns the selected popup menu item name.
x	An integer constant, variable, EQUATE, or expression that specifies the horizontal position of the top left corner of the menu. If omitted, the menu appears at the current cursor position.
y	An integer constant, variable, EQUATE, or expression that specifies the vertical position of the top left corner of the menu. If omitted, the menu appears at the current cursor position.

The **Ask** method displays the popup menu, performs any action set by AddItemEvent or AddItemMimic for the selected item, then returns the selected item's name. The AddItem, AddItemMimic, or AddMenu method sets the item name.

Return Data Type: STRING

Example:

```
MenuChoices EQUATE('&Save Menu|&Restore Menu|-|&Close')!declare menu definition string
 CODE
 PopupMgr.AddMenu(MenuChoices)                          !add Popup menu
 PopupMgr.AddItemMimic('SaveMenu',?Save)                !SaveMenu mimics ?Save button
 PopupMgr.AddItemEvent('Close',EVENT:Accepted,?Close)  !Close POSTs event to a control
 !program code
  IF PopupMgr.Ask() = 'RestoreMenu'                     !if RestoreMenu item selected
   PopupMgr.Restore('MyMenu')                           !code your own functionality
  ELSE                                                  !if any other item selected
  END                                                   !Ask automatically handled it
```

See Also: AddItem, AddItemMimic, AddMenu

DeleteItem (remove menu item)

DeleteItem(*name* **)**

DeleteItem	Deletes a popup menu item.
name	A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.

The **DeleteItem** method deletes a popup menu item and any associated submenu items.

Implementation: The *name* parameter accepts up to 1024 characters.

Example:

```
PopupMgr.AddItem('&Insert','Insert')          !Insert item
PopupMgr.AddItem('&Change','Change')          !Change item
PopupMgr.AddItem('&Delete','Delete')          !Delete item
PopupMgr.AddItem('&Select','Select')          !Select item
IF No_Records_Found
 PopupMgr.DeleteItem('Change')              !remove change item
 PopupMgr.DeleteItem('Delete')              !remove delete item
 PopupMgr.DeleteItem('Select')              !remove select item
END
```

See Also: AddItem, AddItemMimic, AddMenu

DeleteMenu (remove a popup submenu)

DeleteMenu(*name* **)**

DeleteMenu	Deletes a popup submenu item, and all associated child items.
name	A string constant, variable, EQUATE, or expression containing the submenu item name. The AddMenu method set the item name.

The **DeleteMenu** method deletes a popup submenu item and any associated child items.

Implementation: The *name* parameter accepts up to 1024 characters.

Example:

```
PopupMgr.AddItem('&Insert','Insert')          !Insert item
PopupMgr.AddItem('&Change','Change')          !Change item
PopupMgr.AddItem('&Delete','Delete')          !Delete item
PopupMgr.AddItem('&Select','Select')          !Select item
IF No_Records_Found
 PopupMgr.DeleteItem('Change')              !remove change item
 PopupMgr.DeleteItem('Delete')              !remove delete item
 PopupMgr.DeleteItem('Select')              !remove select item
 PopupMgr.DeleteMenu('Format List')         !remove select sub menu
END
```

See Also: AddItem, AddItemMimic, AddMenu

GetItemChecked (return toggle item status)

GetItemChecked(*name* **)**

GetItemChecked Returns the status of a toggle menu item.

name A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.

The **GetItemChecked** method returns one (1) if the item is checked (on) and zero (0) if the item is not checked (off). The SetItemCheck method sets the state of a toggle menu item.

Implementation: The *name* parameter accepts up to 1024 characters.

Return Data Type: BYTE

Example:

```
IF PopupMgr.Ask() = 'Disable'             !if Disable item selected
 IF PopupMgr.GetItemChecked('Disable')    !if item is checked/on
  PopupMgr.SetItemCheck('Disable',False) ! toggle it off
  ENABLE(?Save)                          ! take appropriate action
 ELSE                                    !if item is not checked/off
  PopupMgr.SetItemCheck('Disable',True)  ! toggle it on
  DISABLE(?Save)                         ! take appropriate action
 END
END
```

See Also: AddItem, AddItemMimic, AddMenu, SetItemCheck

GetItemEnabled (return item status)

GetItemEnabled(*name* **)**

GetItemEnabled Returns the enabled/disabled status of a menu item.

name A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.

The **GetItemEnabled** method returns one (1) if the item is enabled and zero (0) if the item is disabled. The SetItemEnable method sets the enabled/disabled state of a menu item.

Implementation: The *name* parameter accepts up to 1024 characters.

Return Data Type: BYTE

Example:

```
IF PopupMgr.GetItemEnabled('Save')     !if item is enabled
 PopupMgr.SetItemEnable('Save',False)  ! disable it
ELSE                                   !if item is disabled
 PopupMgr.SetItemEnable('Save',True)   ! enable it
END
```

See Also: AddItem, AddItemMimic, AddMenu, SetItemEnable

GetItems(returns number of popup entries)

GetItems(*onlyitems***)**

The **GetItems** method returns the number of entries that exist in the current active popup menu.

The *onlyitems* parameter (DEFAULT=0) specifies that only the number of popup items is returned. If non-zero, **GetItems** also returns the depth (nested) levels of the popup menu.

Return Data Type: SHORT

Example:

```
IF Popup.GetItems() ! Only if there are previous items.
   Popup.AddItem('-','Separator1',Popup.GetItems(),1)
END
```

GetLastNumberSelection (get last menu item number selected)

GetLastNumberSelection

The GetLastNumberSelection method returns the numeric order of the last selected menu item. This is also the last number returned by the POPUP() function

The ExecutePopup method (a PRIVATE method) sets the menu item number.

This method is equivalent to:

```
Return SELF.LastNumberSelection
```

Return Data Type: USHORT

GetLastSelection (return selected item)

GetLastSelection

The **GetLastSelection** method returns the name of the last selected item.

The AddItem, AddItemMimic, AddMenu, or AddSubMenu method sets the item name.

Return Data Type: STRING

Example:

```
MenuChoices EQUATE('Fred|Barney|Wilma')      !declare menu definition string
 CODE
 PopupMgr.AddMenu(MenuChoices)               !add Popup menu
 !program code
 PopupMgr.Ask()                              !display menu
 MESSAGE('Thank you for choosing '&PopupMgr.GetLastSelection)
```

See Also: AddItem, AddItemMimic, AddMenu, AddSubMenu

Init (initialize the PopupClass object)

Init([*INIClass*] **)**

Init	Initializes the PopupClass object.
INIClass	The label of the INIClass object for this PopupClass object. The Save method uses the INIClass object to save menu definitions to an INI file; the Restore method uses it to restore the saved menu definitions. If omitted, the Save and Restore methods do nothing.

The **Init** method initializes the PopupClass object.

Example:

```
PopupMgr   PopupClass                      !declare PopupMgr object
INIMgr    INIClass                         !declare INIMgr object
 CODE
 PopupMgr.Init(INIMgr)                     !initialize PopupMgr object
 PopupMgr.AddItem('Save Popup','Save')     !add menu item: Save
 PopupMgr.AddItemMimic('Save',?Save)       !Save item mimics ?Save button
```

See Also: Restore, Save

Kill (shut down the PopupClass object)

Kill

The **Kill** method frees any memory allocated during the life of the PopupClass object and performs any other required termination code.

Example:

```
 PopupMgr.Init                     !initialize PopupMgr object
 !program code
 PopupMgr.Kill                     !shut down PopupMgr object
```

Restore (restore a saved menu)

Restore(*menu* **)**

Restore	Restores a menu saved by the PopupClass.Save method.
menu	A string constant, variable, EQUATE, or expression containing the name of the menu to restore.

The **Restore** method restores a menu saved by the Save method. The Restore method restores all menu attributes that the PopupClass object knows about, including associated menu actions.

Implementation: The Restore method requires an INIClass object. The Init method specifies the INIClass object.

Example:

```
PopupMgr  PopupClass                !declare PopupMgr object
INIMgr    INIClass                  !declare INIMgr object
MenuChoices  EQUATE('&Save Menu|&Restore Menu|-|&Close')!declare menu definition

 CODE
 PopupMgr.Init(INIMgr)              !initialize PopupMgr object
 PopupMgr.AddMenu(MenuChoices)      !add Popup menu
 ACCEPT
  CASE FIELD()
  OF ?Save
   CASE EVENT()
   OF EVENT:Accepted
    PopupMgr.Save('MyPopup')        !save menu definition to INI
   END
  OF ?Restore
   CASE EVENT()
   OF EVENT:Accepted
    PopupMgr.Restore('MyPopup')     !restore menu from INI
   END
  END
 END
```

See Also: Init, Save

Save (save a menu for restoration)

Save(*menu* **)**

Save	Saves a menu for restoration by the PopupClass.Restore method.
menu	A string constant, variable, EQUATE, or expression containing the name of the menu to save.

The **Save** method saves a menu for restoration by the Restore method. The Save method saves all menu attributes that the PopupClass object knows about, including associated menu actions.

Implementation: The Save method requires an INIClass object. The Init method specifies the INIClass object.

Example:

```
PopupMgr   PopupClass                !declare PopupMgr object
INIMgr    INIClass                   !declare INIMgr object
MenuChoices         EQUATE('&Save Menu|&Restore Menu|-|&Close')!declare menu definition

 CODE
 PopupMgr.Init(INIMgr)               !initialize PopupMgr object
 PopupMgr.AddMenu(MenuChoices)       !add Popup menu
 ACCEPT
  CASE FIELD()
  OF ?Save
   CASE EVENT()
   OF EVENT:Accepted
    PopupMgr.Save('MyPopup')         !save menu definition to INI
   END
  OF ?Restore
   CASE EVENT()
   OF EVENT:Accepted
    PopupMgr.Restore('MyPopup')      !restore menu from INI
   END
  END
 END
```

See Also: Init, Restore

SetIcon (set icon name for popup menu item)

SetIcon(*name, iconname* **)**

SetIcon Sets the icon name of a popup menu item.

name A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.

iconname A string constant, variable, EQUATE, or expression containing the name of the icon to attach to the menu item.

The **SetIcon** method sets the icon of a popup menu item. The AddItem or AddSubItem methods adds the menu item to the popup.

Implementation: The *iconname* parameter accepts up to 255 characters.

Example:

```
LOOP sm = 1 to RECORDS(QQ)
  GET(QQ,sm)
  pID = Popup.AddItem(CLIP(QQ.Item) & '  ',Clip(QQ.Item),pID,2)
  Popup.SetIcon(pID,SELF.QkIcon)
  Popup.AddItemEvent(pID,EVENT:NewSelection,QueryControl)
  SELF.PopupList.PopupID = pID
  SELF.PopupList.QueryName = QQ:Item
  ADD(SELF.PopupList)
 END
```

SetItemCheck (set toggle item status)

SetItemCheck(*name, status* **)**

SetItemCheck Sets the status of a toggle menu item.

name A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.

status A Boolean constant, variable, EQUATE, or expression containing the status to which to set the toggle item. A *status* value of one (1) idicates a checked (on) item; zero (0) indicates an unchecked (off) item.

The **SetItemCheck** method sets the status of a toggle menu item. The GetItemChecked method returns the status of a toggle menu item.

Implementation: The *name* parameter accepts up to 1024 characters.

Example:

```
IF PopupMgr.Ask() = 'Disable'            !if Disable item selected
 IF PopupMgr.GetItemChecked('Disable')   !if item is checked/on
  PopupMgr.SetItemCheck('Disable',False) ! toggle it off
  ENABLE(?Save)                          ! take appropriate action
 ELSE                                    !if item is not checked/off
  PopupMgr.SetItemCheck('Disable',True)  ! toggle it on
  DISABLE(?Save)                         ! take appropriate action
 END
END
```

See Also: AddItem, AddItemMimic, AddMenu, GetItemChecked

SetItemEnable (set item status)

SetItemEnable(*name* **)**

SetItemEnable Sets the enabled/disabled status of a menu item.

name A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.

status A Boolean constant, variable, EQUATE, or expression containing the status to which to set the item. A *status* value of one (1) indicates an enabled item; zero (0) indicates a disabled item.

The **SetItemEnable** method sets the enabled/disabled status of a menu item. The GetItemEnabled method returns the enabled/disabled status of a menu item.

Implementation: The *name* parameter accepts up to 1024 characters.

Example:

```
IF PopupMgr.GetItemEnabled('Save')        !if item is enabled
 PopupMgr.SetItemEnable('Save',False)     ! disable it
ELSE                                      !if item is disabled
 PopupMgr.SetItemEnable('Save',True)      ! enable it
END
```

See Also: AddItem, AddItemMimic, AddMenu, GetItemEnabled

SetLevel (set menu item level)

SetLevel(*name, level* **)**

SetLevel	Sets the menu item hierarchy level.
name	A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.
level	An integer constant, variable,a EQUATE, or expression containing the level of the menu item.

The **SetLevel** method sets the menu item hierarchy (nesting) level.

Implementation: The *name* parameter accepts up to 1024 characters.

Example:

```
PopupMgr.SetLevel('Save',2)
```

See Also: AddItem, AddItemMimic, AddMenu

SetText (set menu item text)

SetText(*name, text* **)**

SetText	Sets the menu item text.
name	A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.
text	A string constant, variable, EQUATE, or expression containing the text of the menu item. A single hyphen creates a non-selectable separator (a 3D horizontal bar) on the menu.

The **SetText** method sets the text for a menu item.

Implementation: The *name* and *text* parameters accept up to 1024 characters.

Example:

```
PopupMgr.SetText('Save','&Save')
```

See Also: AddItem, AddItemMimic, AddMenu

SetToolbox (set menu item toolbox status)

SetToolbox(*name, showflag* **)**

SetToolbox Sets the menu item toolbox appearance status.

name A string constant, variable, EQUATE, or expression containing the menu item name. The AddItem, AddItemMimic, or AddMenu methods set the item name.

showflag A Boolean constant, variable, EQUATE, or expression containing the status to which to set the item. A *showflag* value of one (1) indicates that the item will appear on the toolbox; zero (0) indicates that the item will not appear on the toolbox.

The **SetToolbox** method sets whether or not the menu item will appear on a popup toolbox. The Toolbox method displays the popup menu in a toolbox format.

Implementation: The SetToolbox method is used with the BrowseClass SetAlerts method when the BrowseClass ToolControl property is set to TRUE.

Example:

```
IF SELF.ToolControl
  SELF.Popup.AddItem('-')
  SELF.Popup.SetToolbox(SELF.Popup.AddItemMimic(DefaultToolName,|
                        SELF.ToolControl,'!'&DefaultToolName),0)
END
```

See Also: BrowseClass.SetAlerts

Toolbox

SetTranslator (set run-time translator:PopupClass)

SetTranslator(*translator* **)**

SetTranslator Sets the TranslatorClass object for the PopupClass object.

translator The label of the TranslatorClass object for this PopupClass object.

The **SetTranslator** method sets the TranslatorClass object for the PopupClass object. By specifying a TranslatorClass object for the PopupClass object, you can automatically translate the popup menu text--the TranslatorClass object does not otherwise translate popup menus because they are not part of the WINDOW structure.

Implementation: The Ask method uses the TranslatorClass object to translate popup menu text before displaying it.

Example:

```
PopupMgr   PopupClass                !declare PopupMgr object
Translator  TranslatorClass          !declare Translator object

!declare menu definition
MenuChoices  EQUATE('&Save Menu|&Restore Menu|&Close')
 CODE
 Translator.Init                     !initialize Translator object
 PopupMgr.Init(INIMgr)               !initialize PopupMgr object
 PopupMgr.AddMenu(MenuChoices)       !add Popup menu
 PopupMgr.SetTranslator(Translator)  !enable popup text translation
 !program code
 PopupMgr.Ask()                      !display translated menu
```

See Also: Ask

Toolbox (start the popup toolbox menu)

Toolbox(*name* **)**

Toolbox Starts (displays) the popup menu toolbox.

name A string constant, variable, EQUATE, or expression containing the toolbox name. This name will appear in the title bar of the toolbox window.

The **Toolbox** method displays the toolbox popup window. All items enabled by the SetToolbox method are displayed as buttons, with the *name* parameter appearing in the toolbox window's title bar.

Implementation: The Toolbox method is called from the BrowseClass TakeEvent method when the ToolControl property is set to TRUE. It is used to support the BrowseToolbar control template.

Example:

```
BrowseClass.TakeEvent PROCEDURE

CASE ACCEPTED()
 OF SELF.ToolControl
  SELF.Popup.Toolbox('Browse Actions')
END
```

See Also: SetToolbox
BrowseClass.TakeEvent

ViewMenu (popup menu debugger)

ViewMenu

The **ViewMenu** method displays information about the structure of the popup menu built up by the various 'Add' methods.

Implementation: The ViewMenu method only works when the program is compiled with debug information turned on.

PrintPreviewClass

PrintPreviewClass Overview

The PrintPreviewClass is a WindowManager that implements a full-featured print preview dialog.

PrintPreviewClass Concepts

This print preview facility includes pinpoint zoom-in and zoom-out with configurable zoom magnification, random and sequential page navigation, plus thumbnail views of each report page. You can even specify how many rows and columns of thumbnails the print preview facility displays.

When you finish viewing the report, you can send it directly to the printer for immediate What You See Is What You Get (WYSIWYG) printing.

The PrintPreviewClass previews reports in the form of a Windows metafile (.WMF) per report page. The PREVIEW attribute generates reports in Windows metafile format, and the Clarion Report templates provide this capability as well. See PREVIEW in the *Language Reference* for more information, and see Procedure Templates--Report for more information on Report templates.

PrintPreviewClass Relationship to Other Application Builder Classes

The PrintPreviewClass is derived from the WindowManager class (see Window Manager Class for more information).

The PrintPreviewClass relies on the PopupClass and, optionally, the TranslatorClass to accomplish some of its tasks. Therefore, if your program instantiates the PrintPreviewClass, it should also instantiate the PopupClass and may need the Translator class as well. Much of this is automatic when you INCLUDE the PrintPreviewClass header (ABREPORT.INC) in your program's data section. See the Conceptual Example.

The ASCIIPrintClass and the ReportManager use the PrintPreviewClass to provide a print preview facility.

PrintPreviewClass ABC Template Implementation

The Report and Viewer Procedure templates and the Report Wizard Utility template automatically generate all the code and include all the classes necessary to provide the print preview facility for your application's reports.

These Report templates instantiate a PrintPreviewClass object called Previewer for *each* report procedure in the application. This object supports all the functionality specified in the **Preview Options** section of the Report template's **Report Properties** dialog. See *Procedure Templates--Report* for more information.

The template generated ReportManager object (ThisWindow) "drives" the Previewer object, so generally, the only references to the Previewer object within the template generated code are to initially configure the Previewer's properties.

PrintPreviewClass Source Files

The PrintPreviewClass source code is installed by default to the Clarion \LIBSRC folder. The PrintPreviewClass source code and its respective components are contained in:

ABREPORT.INC	PrintPreviewClass declarations
ABREPORT.CLW	PrintPreviewClass method definitions
ABREPORT.TRN	PrintPreviewClass user interface text

Zoom Configuration

The user interface text and the standard zoom choices the PrintPreviewClass displays at runtime are defined in the ABREPORT.TRN file. To modify or customize this text or the standard zoom choices, simply back up the ABREPORT.TRN file then edit it to suit your needs. See *ZoomIndex* for more information.

PrintPreviewClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a PrintPreviewClass object and some related objects.

This example uses the PrintPreviewClass object to preview a very simple report before printing it. The program specifies an initial position and size for the print preview window and allows custom zoom factors.

```
   PROGRAM

   INCLUDE('ABREPORT.INC')              !declare ReportManager & PrintPreviewClass
   MAP
   END

GlobalErrors ErrorClass
VCRRequest  LONG(0),THREAD

Customer   FILE,DRIVER('TOPSPEED'),PRE(CUS),THREAD
BYNUMBER    KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record      RECORD,PRE()
CUSTNO       LONG
Name         STRING(30)
State        STRING(2)
            END
           END

Access:Customer CLASS(FileManager)     !declare Access:Customer object
Init            PROCEDURE
                END

Relate:Customer CLASS(RelationManager) !declare Relate:Customer object
Init            PROCEDURE
                END

CusView     VIEW(Customer)             !declare CusView VIEW
            END

PctDone     BYTE                       !track progress variable
```

```
report  REPORT,AT(1000,1542,6000,7458),PRE(RPT),FONT('Arial',10,,),THOUS
      HEADER,AT(1000,1000,6000,542),FONT(,,,FONT:bold)
       STRING('Customers'),AT(2000,20),FONT(,14,,)
       STRING('Id'),AT(52,313),TRN
       STRING('Name'),AT(2052,313),TRN
       STRING('State'),AT(4052,313),TRN
      END
detail   DETAIL,AT(,,6000,281),USE(?detail)
       STRING(@n-14),AT(52,52),USE(CUS:CUSTNO)
       STRING(@s30),AT(2052,52),USE(CUS:NAME)
       STRING(@s2),AT(4052,52),USE(CUS:State)
      END
      FOOTER,AT(1000,9000,6000,219)
       STRING(@pPage <<<#p),AT(5250,31),PAGENO,USE(?PageCount)
      END
     END

ProgressWindow WINDOW('Progress...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
                PROGRESS,USE(PctDone),AT(15,15,111,12),RANGE(0,100)
                STRING(''),AT(0,3,141,10),USE(?UserString),CENTER
                STRING(''),AT(0,30,141,10),USE(?TxtDone),CENTER
                BUTTON('Cancel'),AT(45,42),USE(?Cancel)
               END

ThisProcedure CLASS(ReportManager)        !declare ThisProcedure object
Init      PROCEDURE(),BYTE,PROC,VIRTUAL
Kill      PROCEDURE(),BYTE,PROC,VIRTUAL
          END

CusReport   CLASS(ProcessClass)           !declare CusReport object
TakeRecord  PROCEDURE(),BYTE,PROC,VIRTUAL
            END

Previewer   PrintPreviewClass             !declare Previewer object
                                          ! for use with ThisProcedure
  CODE
  ThisProcedure.Run()                     !run the procedure

ThisProcedure.Init  PROCEDURE()           !initialize ThisProcedure
ReturnValue      BYTE,AUTO
  CODE
  GlobalErrors.Init
  Relate:Customer.Init
  ReturnValue = PARENT.Init()
  SELF.FirstField = ?PctDone
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  Relate:Customer.Open
```

```
  OPEN(ProgressWindow)
  SELF.Opened=True
  CusReport.Init(CusView,Relate:Customer,?TxtDone,PctDone,RECORDS(Customer))
  CusReport.AddSortOrder(CUS:BYNUMBER)
  SELF.AddItem(?Cancel,RequestCancelled)
  SELF.Init(CusReport,report,Previewer)   !register Previewer with ThisProcedure
  SELF.Zoom = PageWidth
  Previewer.AllowUserZoom=True            !allow custom zoom factors
  Previewer.Maximize=True                 !initially maximize preview window
  SELF.SetAlerts()
  RETURN ReturnValue

ThisProcedure.Kill  PROCEDURE()
ReturnValue      BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Customer.Close
  Relate:Customer.Kill
  GlobalErrors.Kill
  RETURN ReturnValue

CusReport.TakeRecord PROCEDURE()
ReturnValue      BYTE,AUTO
SkipDetails BYTE
  CODE
  ReturnValue = PARENT.TakeRecord()
  PRINT(RPT:detail)
  RETURN ReturnValue

Access:Customer.Init PROCEDURE
  CODE
  PARENT.Init(Customer,GlobalErrors)
  SELF.FileNameValue = 'Customer'
  SELF.Buffer &= CUS:Record
  SELF.Create = 0
  SELF.LazyOpen = False
  SELF.AddKey(CUS:BYNUMBER,'CUS:BYNUMBER',0)

Relate:Customer.Init PROCEDURE
  CODE
  Access:Customer.Init
  PARENT.Init(Access:Customer,1)
```

PrintPreviewClass Properties

The PrintPreviewClass contains properties that primarily allow configuration of the print preview window and its features. The PrintPreviewClass properties are described below.

AllowUserZoom (allow any zoom factor)

AllowUserZoom BYTE

The **AllowUserZoom** property indicates whether the PrintPreviewClass object provides user zoom capability for the end user. The user zoom lets the end user apply any zoom factor. Without user zoom, the end user may only apply the standard zoom choices.

The ZoomIndex property indicates whether a user zoom factor or a standard zoom factor is applied.

Implementation: A value of one (1) enables user zoom capability; a value of zero (0) disables user zoom. The UserPercentile property contains the user zoom factor.

See Also: UserPercentile, ZoomIndex

ConfirmPages (force 'pages to print' confirmation)

ConfirmPages BYTE

The **ConfirmPages** property indicates whether or not the AskPrintPages method should be called before printing.

Implementation: Zero (0) is the default; a value of one (1) forces the enduser to choose the pages to print before the print job is sent to the printer.

See Also: AskPrintPages

CurrentPage (the selected report page)

CurrentPage LONG

The **CurrentPage** property contains the number of the selected report page. The PrintPreviewClass object uses this property to highlight the selected report page when more than one page is displayed, to navigate pages, and to dislay the current page number for the end user.

Maximize (number of pages displayed horizontally)

Maximize BYTE

The **Maximize** property indicates whether to open the preview window mazimized. A value of one (1 or True) maximizes the window; a value of zero (0 or False) opens the window according to the WindowSizeSet property.

See Also: WindowSizeSet

PagesAcross (number of pages displayed horizontally)

PagesAcross USHORT

The **PagesAcross** property contains the number of thumbnail pages the PrintPreviewClass object displays *horizontally* within the preview window. The PrintPreviewClass object uses this property to calculate appropriate positions and sizes when displaying several pages at a time.

The PrintPreviewClass object displays the PagesAcross value at runtime and lets the end user set the value as well.

PagesDown (number of vertical thumbnails)

PagesDown USHORT

The **PagesDown** property contains the number of thumbnail pages the PrintPreviewClass object displays *vertically* within the preview window. The PrintPreviewClass object uses this property to calculate appropriate positions and sizes when displaying several pages at a time.

The PrintPreviewClass object displays the PagesDown value at runtime and lets the end user set the value as well.

PagesToPrint (the pages to print)

PagesToPrint CSTRING(256), PROTECTED

The **PagesToPrint** property contains the page range to print.

The default value is 1-*n*, where *n* is equal to the total number of pages in the report. Individual pages can be printed by seperating page numbers by commas. A range of pages to print can be specified by seperating the first page number to print and the last page number to print by a dash (-). Combinations of individual pages and ranges of pages are allowed.

UserPercentile (custom zoom factor)

UserPercentile USHORT

The **UserPercentile** property contains the user specified zoom factor. The PrintPreviewClass object solicits this factor from the end user and applies it to the selected report page when the AllowUserZoom property is True. The SetZoomPercentile method sets the UserPercentile property.

See Also: AllowUserZoom, SetZoomPercentile

WindowPosSet (use a non-default initial preview window position)

WindowPosSet BYTE

The **WindowPosSet** property contains a value indicating whether a non-default initial position is specified for the print preview window. The PrintPreviewClass object uses this property to determine the initial position of the print preview window.

Implementation: The SetPosition method sets the value of this property. A value of one (1) indicates a non-default initial position is specified and is applied; a zero (0) indicates no position is specified and the default position is applied.

See Also: SetPosition

WindowSizeSet (use a non-default initial preview window size)

WindowSizeSet BYTE

The **WindowSizeSet** property contains a value indicating whether a non-default initial size is specified for theprint preview window. The PrintPreviewClass object uses this property to determine the initial size of the print preview window.

Implementation: The SetPosition method sets the value of this property. A value of one (1) indicates a non-default initial size is specified and is applied; a zero (0) indicates no size is specified and the default size is applied.

See Also: SetPosition

ZoomIndex (index to applied zoom factor)

ZoomIndex BYTE

The **ZoomIndex** property contains a value indicating which zoom factor is applied. The PrintPreviewClass object uses this property to identify and apply the selected zoom factor. The SetZoomPercentile method sets the ZoomIndex property.

Implementation: The ZoomIndex value "points" to one of the 7 standard zoom settings or to a user zoom setting. The PrintPreviewClass object sets the ZoomIndex value when the end user selects a zoom setting from one of the zoom menus or from the zoom combo box. The standard zoom choices are defined in ABREPORT.TRN as follows:

No Zoom	Displays the specified number of pages (PagesAcross and PagesDown properties) in a tiled arrangement in the preview window.
Page Width	Displays a single page whose width is the same as the width of the preview window.
50%	Displays a single page at 50% of actual print size.
75%	Displays a single page at 75% of actual print size.
100%	Displays a single page at 100% of actual print size.
200%	Displays a single page at 200% of actual print size.
300%	Displays a single page at 300% of actual print size.

A ZoomIndex value of zero (0) indicates a nonstandard zoom factor is specified. Nonstandard zoom factors may be specified when the AllowUserZoom property is True. The UserPercentile property contains the nonstandard zoom factor.

See Also: AllowUserZoom, PagesAcross, PagesDown, UserPercentile, SetZoomPercentile

PrintPreviewClass Methods

The PrintPreviewClass contains the methods listed below.

PrintPreviewClass Functional Organization--Expected Use

As an aid to understanding the PrintPreviewClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the PrintPreviewClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into two categories:

Housekeeping (one-time) Use:

Initv	initialize the PrintPreviewClass object
SetPosition	set initial preview window coordinates
Displayv	preview the report
Killv	shut down the PrintPreviewClass object

Occasional Use:

SetINIManager	save and restore window coordinates
SetPosition	set print preview position and size
SetZoomPercentile	set user or standard zoom factor

v These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--the Display method calls them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Initv	initialize the PrintPreviewClass object
AskPage	prompt for new report page
AskThumbnails	prompt for new thumbnail configuration
Display	preview the report
Open	prepare preview window for display
TakeAccepted	process EVENT:Accepted events
TakeEvent	process all events
TakeFieldEvent	a virtual to process field events
TakeWindowEvent	process non-field events
Killv	shut down the PrintPreviewClass object

AskPage (prompt for new report page)

AskPage, PROC, VIRTUAL, PROTECTED

The **AskPage** method prompts the end user for a specific report page to display and returns a value indicating whether a new page is selected. A return value of one (1) indicates a new page is selected and a screen redraw is required; a return value of zero (0) indicates a new page is not selected and a screen redraw is not required.

Implementation: The PrintPreviewClass.Display method calls the AskPage method. The AskPage method displays a dialog that prompts for a specific report page.

Return Data Type: BYTE

Example:

```
!Virtual implementation of AskPage: a simplified version with no translator...
PrintPreviewClass.AskPage FUNCTION
JumpPage LONG,AUTO
RVal     BOOL(False)

JumpWin WINDOW('Jump to Page'),AT(,,181,26),CENTER,GRAY,DOUBLE
         PROMPT('&Page:'),AT(5,8),USE(?JumpPrompt)
         SPIN(@n5),AT(30,7),USE(JumpPage),RANGE(1,10),STEP(1)
         BUTTON('OK'),AT(89,7),USE(?OKButton),DEFAULT
         BUTTON('Cancel'),AT(134,7),USE(?CancelButton)
        END
 CODE
 JumpPage=SELF.CurrentPage
 OPEN(JumpWin)
 ACCEPT
  CASE EVENT()
  OF EVENT:OpenWindow
   ?JumpPage{PROP:RangeHigh}=RECORDS(SELF.ImageQueue)
  OF EVENT:Accepted
   CASE ACCEPTED()
   OF ?OKButton
    IF JumpPage NOT=SELF.CurrentPage
     RVal=True                    !SELF.CurrentPage changed
     SELF.CurrentPage=JumpPage
    END
    POST(EVENT:CloseWindow)
   OF ?CancelButton
    POST(EVENT:CloseWindow)
   END
  END
 END
   CLOSE(JumpWin); RETURN Rval
```

AskPrintPages (prompt for pages to print)

AskPrintPages, VIRTUAL, PROTECTED, PROC

The **AskPrintPages** method prompts the end user for the number(s) of the pages to print from the previewed report.

Implementation: The PrintPreviewClass.TakeAccepted method calls the AskPrintPages method and returns TRUE (1) when completed or FALSE (0) if the user presses the cancel button. The AskPrintPages method displays a dialog that prompts for the page numbers to print.

Return Data Type: BYTE

Example:

```
!Virtual implementation of AskThumbnails
PrintPreviewClass.AskPrintPages PROCEDURE
Preserve  LIKE(PrintPreviewClass.PagesToPrint),AUTO
Window WINDOW('Pages to Print'),AT(,,260,37),CENTER,SYSTEM,GRAY
       PROMPT('&Pages to Print:'),AT(4,8),USE(?Prompt)
       ENTRY(@s255),AT(56,4,200,11),USE(SELF.PagesToPrint, , ?PagesToPrint)
       BUTTON('&Reset'),AT(116,20,45,14),USE(?Reset)
       BUTTON('&Ok'),AT(164,20,45,14),USE(?Ok),DEFAULT
       BUTTON('&Cancel'),AT(212,20,45,14),USE(?Cancel),STD(STD:Close)
     END
RVal  BYTE(False)
  CODE
  Preserve = SELF.PagesToPrint
  OPEN(Window)
  ACCEPT
    CASE EVENT()
    OF EVENT:Accepted
      CASE ACCEPTED()
      OF ?Cancel
        SELF.PagesToPrint = Preserve
        POST(EVENT:CloseWindow)
      OF ?Ok
        RVal = True
        POST(EVENT:CloseWindow)
      OF ?Reset
        SELF.SetDefaultPages
        SELECT(?PagesToPrint)
      END
```

```
    OF EVENT:OpenWindow
      ! INIMgr code for FETCHing window settings
    OF EVENT:CloseWindow
      ! INIMgr code for UPDATEing window settings
    END
  END
  CLOSE(Window)
  RETURN Rval
```

AskThumbnails (prompt for new thumbnail configuration)

AskThumbnails, VIRTUAL, PROTECTED

The **AskThumbnails** method prompts the end user for the number of pages to tile across and down the preview window.

Implementation: The PrintPreviewClass.Display method calls the AskThumbnails method. The AskThumbnails method displays a dialog that prompts for the number of thumbnails to display horizontally, and the number of thumbnails to display vertically.

Example:

```
!Virtual implementation of AskThumbnails
! a slightly simplified version with no translator...
PrintPreviewClass.AskThumbnails PROCEDURE

SelectWindow WINDOW('Pages Displayed'),AT(,,141,64),GRAY,DOUBLE
         GROUP('Across'),AT(7,10,62,32),BOXED
           SPIN(@N2),AT(13,22,15),USE(SELF.PagesAcross,,?PagesAcross),RANGE(1,10)
         END
         GROUP('Down'),AT(72,10,62,32),BOXED
           SPIN(@N2),AT(79,22,15),USE(SELF.PagesDown,,?PagesDown),RANGE(1,10)
         END
         BUTTON('OK'),AT(98,47,40,14),KEY(EnterKey),USE(?OK)
             END

   CODE
   OPEN(SelectWindow)
   ACCEPT
     CASE EVENT()
     OF EVENT:Accepted
       CASE FIELD()
       OF ?OK
         IF SELF.PagesAcross*SELF.PagesDown>RECORDS(SELF.ImageQueue)
           SELECT(?PagesAcross)
         ELSE
           POST(EVENT:CloseWindow)
         END
       END
     END
   END
   CLOSE(SelectWindow)
```

DeleteImageQueue (remove non-selected pages)

DeleteImageQueue(*page*), VIRTUAL, PROC

DeleteImageQueue Removes a page number from the ImageQueue.

page An integer constant, variable, EQUATE, or expression containing the page number to delete.

The **DeleteImageQueue** method removes records from the ImageQueue, and the associated image file, which have not been selected for printing.

Implementation: The SyncImageQueue method calls the DeleteImageQueue method. The value contained in the PagesToPrint property determines which records and images are deleted.

Return Data Type: BYTE

Example:

```
PrintPreviewClass.SyncImageQueue PROCEDURE
i LONG,AUTO

  CODE
  LOOP i = RECORDS(SELF.ImageQueue) TO 1 BY -1
    IF ~SELF.InPageList(i)
      SELF.DeleteImageQueue(i)
    END
  END
```

See Also: PagesToPrint,DeleteImageQueue

Display (preview the report)

Display([*zoom*] [*, page*] [*, across*] [*, down*] **), VIRTUAL, PROC**

Display	Displays the report image metafiles.
zoom	An integer constant, variable, EQUATE, or expression containing the initial zoom factor for the print preview display. If omitted, the Display method uses the default zoom factor in the ABREPORT.TRN file.
page	An integer constant, variable, EQUATE, or expression containing the initial page number to display. If omitted, *page* defaults to one (1).
across	An integer constant, variable, EQUATE, or expression containing the number of horizontal thumbnails for the initial print preview display. If omitted, *across* defaults to one (1).
down	An integer constant, variable, EQUATE, or expression containing the number of vertical thumbnails for the initial print preview display. If omitted, *down* defaults to one (1).

The **Display** method displays the report image metafiles and returns a value indicating whether or not to print them. A return value of one (1 or True) indicates the end user asked to print the report; a return value of zero (0 or False) indicates the end user did not ask to print the report.

The Display method is the print preview engine. It manages the print preview, providing navigation, zoom, thumbnail configuration, plus the option to immediately print the report.

Implementation: The Display method declares the preview WINDOW, then calls the WindowManager.Ask method to display the preview WINDOW and process its events. EQUATEs for the *zoom* parameter are declared in ABREPORT.INC:

```
NoZoom          EQUATE(-2)
PageWidth       EQUATE(-1)
```

In addition to the EQUATE values, you may specify any integer zoom factor, such as 50 (50% zoom) or 200 (200% zoom).

Return Data Type: BYTE

Example:

```
IF ReportCompleted                  !if report was not cancelled
 ENDPAGE(report)                    !force final page overflow
 IF PrtPrev.Display()               !preview the report on-line
  report{PROP:FlushPreview} = True  !and print it if user asked to
 END
END
```

See Also: WindowManager.Ask

Init (initialize the PrintPreviewClass object)

Init(*image queue* **), VIRTUAL**

Init	Initializes the PrintPreviewClass object.
image queue	The label of the QUEUE containing the filenames of the report image metafiles. See *PREVIEW* in the *Language Reference* for more information on report image metafiles.

The **Init** method Initializes the PrintPreviewClass object.

Implementation: The PrintPreviewClass.Init method instantiates a PopupClass object for the PrintPreviewClass object, using the menu text defined in ABREPORT.TRN.

The image queue parameter names a QUEUE with the same structure as the PreviewQueue declared in \ABREPORT.INC as follows:

```
PreviewQueue      QUEUE,TYPE
Filename            STRING(128)
                  END
```

Example:

```
PrintPreviewQueue  PreviewQueue        !declare report image queue
PrtPrev       PrintPreviewClass        !declare PrtPrev object
 CODE
 PrtPrev.Init(PrintPreviewQueue)       !initialize PrtPrev object
 !program code
 PrtPrev.Kill                          !shut down PrtPrev object
```

InPageList (check page number)

InPageList(*page*)

InPageList	Evaluates page against value(s) in PagesToPrint.
page	An integer constant, variable, EQUATE, or expression containing the page number to check.

The **InPageList** method evaluates a page number against the value(s) contained in the PagesToPrint property, and returns TRUE (1) if the page is in PagesToPrint or FALSE (0) if it is not.

Implementation: The PageManagerClass.Draw (which is PRIVATE) and SyncImageQueue methods call the InPageList method to verify report pages for inclusion in the preview window and the printed report respectively.

Return Data Type: BYTE

Example:

```
PrintPreviewClass.SyncImageQueue PROCEDURE
i LONG,AUTO
  CODE
  LOOP i = RECORDS(SELF.ImageQueue) TO 1 BY -1
    IF ~SELF.InPageList(i)
      SELF.DeleteImageQueue(i)
    END
  END
```

See Also: PagesToPrint

Kill (shut down the PrintPreviewClass object)

Kill, VIRTUAL, PROC

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.Kill returns a value to indicate the status of the shut down.

Implementation: The Kill method calls the WindowManager.Kill method and returns Level:Benign to indicate a normal shut down. Return value EQUATEs are declared in ABERROR.INC.

Return Data Type: BYTE

Example:

```
PrintPreviewQueue  PreviewQueue          !declare report image queue
PrtPrev       PrintPreviewClass          !declare PrtPrev object
 CODE
 PrtPrev.Init(PrintPreviewQueue)         !initialize PrtPrev object
 !program code
 PrtPrev.Kill                            !shut down PrtPrev object
```

See Also: WindowManager.Kill

Open (prepare preview window for display)

Open, VIRTUAL

The **Open** method prepares the PrintPreviewClass window for initial display. It is designed to execute on window opening events such as EVENT:OpenWindow and EVENT:GainFocus.

Implementation: The Open method sets the window's initial size and position, enables and disables controls as needed, and sets up the specified zoom configuration.

The WindowManager.TakeWindowEvent method calls the Open method.

Example:

```
ThisWindow.TakeWindowEvent PROCEDURE
  CODE
  CASE EVENT()
  OF EVENT:OpenWindow
    IF ~BAND(SELF.Inited,1)
      SELF.Open
    END
  OF EVENT:GainFocus
    IF BAND(SELF.Inited,1)
      SELF.Reset
    ELSE
      SELF.Open
    END
  END
  RETURN Level:Benign
```

See Also: WindowManager.TakeWindowEvent

SetINIManager (save and restore window coordinates)

SetINIManager(*INI manager* **)**

SetINIManager Enables save and restore of preview window position and size between computing sessions.

INI manager The label of the INIClass object that saves and restores window coordinates. See *INI Class* for more information.

The **SetINIManager** method names an INIClass object to save and restore window coordinates between computing sessions.

Implementation: The Open method uses the *INI manager* to restore the window's initial size and position. The TakeEvent method uses the *INI manager* to save the window's size and position.

Example:

```
ThisWindow.Init PROCEDURE()
  CODE
 !procedure code
  ThisWindow.Init(Process,report,Previewer)
  Previewer.SetINIManager(INIMgr)
```

See Also: Open, TakeEvent

SetPosition (set initial preview window coordinates)

SetPosition([*x*] [,*y*] [,*width*] [,*height*] **)**

SetPosition	Sets the initial position and size of the print preview window.
x	An integer constant, variable, EQUATE, or expression containing the initial horizontal position of the print preview window. If omitted, the print preview window opens to the default Windows position.
y	An integer constant, variable, EQUATE, or expression containing the initial vertical position of the print preview window. If omitted, the print preview window opens to the default Windows position.
width	An integer constant, variable, EQUATE, or expression containing the initial width of the print preview window. If omitted, the print preview window opens to its default width.
height	An integer constant, variable, EQUATE, or expression containing the initial height of the print preview window. If omitted, the print preview window opens to its default height.

The **SetPosition** method sets the initial position and size of the print preview window.

Implementation: The SetPosition method sets the WindowPosSet and WindowSizeSet properties.

The Display method definition determines the default width and height of the print preview window.

Example:

```
PrtPrev.SetPosition(1,1,300,250)        !set initial position and size
PrtPrev.SetPosition(1,1)                !set initial position only
PrtPrev.SetPosition(,,300,250)          !set initial size only
```

See Also: WindowPosSet, WindowSizeSet

SetZoomPercentile (set user or standard zoom factor)

SetZoomPercentile(*zoom factor* **)**

SetZoomPercentile Sets the ZoomIndex and UserPercentile properties.

zoom factor An integer contant, variable, EQUATE, or expression indicating the zoom factor to apply.

The **SetZoomPercentile** method sets the ZoomIndex property and the UserPercentile property.

Implementation: The SetZoomPercentile method assumes the AllowUserZoom property is True. If the *zoom factor* equals a defined ZoomIndex choice, SetZoomPercentile sets the ZoomIndex property to that choice and sets the UserPercentile property to zero. If the *zoom factor* does not equal a defined ZoomIndex choice, SetZoomPercentile sets the UserPercentile property to the *zoom factor* and sets the ZoomIndex property to zero.

Example:

```
ThisWindow.Init PROCEDURE()
  CODE
 !procedure code
  ThisWindow.Init(Process,report,Previewer)
  Previewer.SetZoomPercentile(120)
```

See Also: AllowUserZoom, UserPercentile, ZoomIndex

SetDefaultPages (set the default pages to print)

SetDefaultPages, VIRTUAL

The **SetDefaultPages** method sets the initial value of the PagesToPrint property. The initial value is 1-*n*, where *n* is equal to the total number of pages in the report.

Implementation: The Display and AskPrintPreview methods call the SetDefaultPages method.

Example:

```
!Virtual implementation of SetDefaultPages method
PrintPreviewClass.SetDefaultPages PROCEDURE
  CODE
  SELF.PagesToPrint = '1-' & RECORDS(SELF.ImageQueue)
```

See Also: PagesToPrint

SyncImageQueue (sync image queue with PagesToPrint)

SyncImageQueue, VIRTUAL

The **SyncImageQueue** method synconizes the image queue with the contents of PagesToPrint to ensure that only the specified pages are sent to the printer.

Implementation: The Display method calls the SyncImageQueue method. The value contained in the PagesToPrint property determines which pages are printed.

Example:

```
PrintPreviewClass.Display PROCEDURE
! Window declaration
! executable Display code
  IF SELF.PrintOk
    SELF.SyncImageQueue
  END
  RETURN SELF.PrintOK
```

See Also: PagesToPrint

TakeAccepted (process EVENT:Accepted events:PrintPreviewClass)

TakeAccepted, VIRTUAL, PROC

The **TakeAccepted** method processes EVENT:Accepted events for all the controls on the preview window, then returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeAccepted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeEvent method calls the TakeAccepted method. The TakeAccepted method calls the WindowManager.TakeAccepted method, then processes EVENT:Accepted events for all the controls on the preview window, including zoom controls, print button, navigation controls, thumbnail configuration controls, etc.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: TakeEvent, WindowManager.TakeEvent

TakeEvent (process all events:PrintPreviewClass)

TakeEvent, VIRTUAL, PROC

The **TakeEvent** method processes all preview window events and returns a value indicating whether ACCEPT loop processing is complete and should stop. TakeEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The Ask method calls the TakeEvent method. The TakeEvent method calls the WindowManager.TakeEvent method, then processes EVENT:CloseWindow, EVENT:Sized and EVENT:AlertKey events for the preview window.

Return Data Type: BYTE

Example:

```
WindowManager.Ask PROCEDURE
  CODE
  IF SELF.Dead THEN RETURN .
  CLEAR(SELF.LastInsertedPosition)
  ACCEPT
    CASE SELF.TakeEvent()
    OF Level:Fatal
      BREAK
    OF Level:Notify
      CYCLE ! Used for 'short-stopping' certain events
    END
  END
```

See Also: WindowManager.Ask

TakeFieldEvent (a virtual to process field events:PrintPreviewClass)

TakeFieldEvent, VIRTUAL, PROC

The **TakeFieldEvent** method is a virtual placeholder to process all field-specific/control-specific events for the window. It returns a value indicating whether window process is complete and should stop. TakeFieldEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeEvent method calls the TakeFieldEvent method. The TakeFieldEvent method processes EVENT:NewSelection events for the preview window SPIN controls.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: Ask

TakeWindowEvent (process non-field events:PrintPreviewClass)

TakeWindowEvent, VIRTUAL, PROC

The **TakeWindowEvent** method processes all non-field events for the preview window and returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeWindowEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeEvent method calls the TakeWindowEvent method. The TakeWindowEvent method calls the WindowManager.TakeWindowEvent method for all events except EVENT:GainFocus.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: TakeEvent

ProcessClass

ProcessClass Overview

The ProcessClass is a ViewManager with a progress window.

ProcessClass Concepts

The ProcessClass lets you "batch" process a VIEW, applying sort orders, range limits, and filters as needed to process only the specific result set in the specific sequence you require; plus the ProcessClass supplies appropriate (configurable) visual feedback to the end user on the progress of the batch process.

ProcessClass Relationship to Other Application Builder Classes

The ProcessClass is derived from the ViewManager, plus it relies on many of the other Application Builder Classes to accomplish its tasks. Therefore, if your program instantiates the ProcessClass, it must also instantiate these other classes. Much of this is automatic when you INCLUDE the ProcessClass header (ABREPORT.INC) in your program's data section. See the Conceptual Example.

The ReportManager uses the ProcessClass to process report data and provide appropriate visual feedback to the end user on the progress of the report.

ProcessClass ABC Template Implementation

The ABC Templates automatically include all the classes necessary to support the batch processes (Process procedures and Report procedures) specified in your application.

The templates *derive* a class from the ProcessClass for *each* batch process (Process Procedures and Report Procedures) in the application. The derived classes are called ThisProcess and ThisReport. These derived ProcessClass objects support all the functionality specified in the Process or Report procedure template.

The derived ProcessClass is local to the procedure, is specific to a single process and relies on the global file-specific RelationManager and FileManager objects for the processed files.

ProcessClass Source Files

The ProcessClass source code is installed by default to the Clarion \LIBSRC. The ProcessClass source code and their respective components are contained in:

ABREPORT.INC	ProcessClass declarations
ABREPORT.CLW	ProcessClass method definitions

ProcessClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a ProcessClass object and related objects. This example processes selected records in a file, updates them, and displays a window with a progress bar to show the progress of the process.

```
 PROGRAM
 INCLUDE('ABWINDOW.INC')               !declare WindowManager Class
 INCLUDE('ABREPORT.INC')               !declare Process Class
 MAP
 END
Customer FILE,DRIVER('TOPSPEED'),PRE(CUS),THREAD !declare Customer file
BYNUMBER  KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record    RECORD,PRE()
CUSTNO     LONG
Name       STRING(30)
State      STRING(2)
          END
         END
CusView  VIEW(Customer)               !declare VIEW for process
         END
Access:Customer CLASS(FileManager)    !declare Access:Customer object
Init            PROCEDURE
                END
Relate:Customer CLASS(RelationManager)!declare Relate:Customer object
Init            PROCEDURE
                END
ThisWindow      CLASS(ReportManager)  !declare ThisWindow object
Init            PROCEDURE(),BYTE,PROC,VIRTUAL
Kill            PROCEDURE(),BYTE,PROC,VIRTUAL
                END
ThisProcess     CLASS(ProcessClass)   !declare ThisProcess object
TakeRecord      PROCEDURE(),BYTE,PROC,VIRTUAL
                END
ProgressMgr   StepLongClass           !declare ProgressMgr object
GlobalErrors  ErrorClass              !declare GlobalErrors object
VCRRequest   LONG(0),THREAD
Thermometer   BYTE                    !declare PROGRESS variable
ProgressWindow WINDOW('Progress...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
               PROGRESS,USE(Thermometer),AT(15,15,111,12),RANGE(0,100)
               STRING(''),AT(0,3,141,10),USE(?UserString),CENTER
               STRING(''),AT(0,30,141,10),USE(?PctText),CENTER
               BUTTON('Cancel'),AT(45,42),USE(?Cancel)
              END
  CODE
  ThisWindow.Run()                    !run the Process procedure
```

```
ThisWindow.Init  PROCEDURE()          !initialize things
ReturnValue    BYTE,AUTO
 CODE
 GlobalErrors.Init                    !initialize GlobalErrors object
 Relate:Customer.Init                 !initialize Relate:Customer object
 ReturnValue = PARENT.Init()          !call base class init
 SELF.FirstField = ?Thermometer       !set FirstField for ThisWindow
 SELF.VCRRequest &= VCRRequest        !VCRRequest not used
 SELF.Errors &= GlobalErrors          !set errorhandler for ThisWindow
 Relate:Customer.Open                !Open Customer and related files
 OPEN(ProgressWindow)                !open the window
 SELF.Opened=True                    !set Opened flag for ThisWindow
 ProgressMgr.Init(ScrollSort:AllowNumeric)    !initialize ProgressMgr object
 !init ThisProcess by naming its VIEW, RelationManager,ProgressMgr & progress variables
 ThisProcess.Init(CusView,Relate:Customer,?PctText,Thermometer,ProgressMgr,CUS:CUSTNO)
 ThisProcess.AddSortOrder(CUS:BYNUMBER)       !set the process sort order
 SELF.Init(ThisProcess)                       !process specific initialization
 SELF.AddItem(?Cancel,RequestCancelled)       !register Cancel with ThisWindow
 SELF.SetAlerts()                             !alert keys for ThisWindow
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()         !shut down things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()         !call base class shut down
 Relate:Customer.Close               !close Customer and related files
 Relate:Customer.Kill                !shut down Relate:Customer object
 GlobalErrors.Kill                   !shut down GlobalErrors object
 RETURN ReturnValue

ThisProcess.TakeRecord PROCEDURE()   !action for each record processed
ReturnValue       BYTE,AUTO
 CODE
 IF NOT CUS:State                    !if State is blank
  CUS:State = 'FL'                   ! set it to 'FL'
 END
 ReturnValue = PARENT.TakeRecord()   !call base class for each record
 PUT(CusView)                        !write the updated record
 IF ERRORCODE()                      !if write failed
  ThisWindow.Response = RequestCompleted     ! shut down process
  ReturnValue = Level:Fatal          !Use IF Relate:Customer.Update()
 END                                 !to apply RI constraints to
 RETURN ReturnValue                  ! Customer and related files.
```

```
Access:Customer.Init PROCEDURE
 CODE
 PARENT.Init(Customer,GlobalErrors)
 SELF.FileNameValue = 'Customer'
 SELF.Buffer &= CUS:Record
 SELF.LazyOpen = False
 SELF.AddKey(CUS:BYNUMBER,'CUS:BYNUMBER',0)

Relate:Customer.Init PROCEDURE
 CODE
 Access:Customer.Init
 PARENT.Init(Access:Customer,1)
```

ProcessClass Properties

The ProcessClass inherits all the properties of the ViewManager class from which it is derived. See *ViewManager Properties* for more information.

In addition to the inherited properties, the ProcessClass contains the following properties:

CaseSensitiveValue (case sensitive flag)

CaseSensitiveValue BYTE

The **CaseSensitiveValue** property is set to zero (0 or False) when the key for the processed FILE is a case insensitive key, i.e. the NOCASE attriute is on the key definition.

Percentile (portion of process completed)

Percentile &BYTE, PROTECTED

The **Percentile** property is a reference to a variable whose contents indicates how much of the process is completed. The ProcessClass periodically updates the Percentile property so it can be the USE variable for a PROGRESS control.

The Init method initializes the Percentile property. See the *Conceptual Example*.

See Also: Init

PText (progress control number)

PText SIGNED

The **PText** property contains the control number of a text based Window control such as a STRING or PROMPT. The ProcessClass uses this control to provide visual feedback to the end user.

The Init method initializes the PText property. See the *Conceptual Example*.

This property is PROTECTED, therefore, it can only be referenced by a ProcessClass method, or a method in a class derived from ProcessClass.

See Also: Init

RecordsProcessed (number of elements processed)

RecordsProcessed LONG

The **RecordsProcessed** property contains the number of elements processed so far. The ProcessClass uses this property to calculate how much of the process is completed.

RecordsToProcess (number of elements to process)

RecordsToProcess LONG

The **RecordsToProcess** property contains the total number of elements to process. The ProcessClass uses this property to calculate how much of the process is completed.

ProcessClass Methods

The ProcessClass inherits all the methods of the ViewManager class from which it is derived. See *ViewManager Properties* for more information.

ProcessClass Functional Organization--Expected Use

As an aid to understanding the ProcessClass, it is useful to organize its methods into two categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ProcessClass methods.

Non-Virtual Methods

Housekeeping (one-time) Use:

Init	initialize the ProcessClass object
AddRange[I]	add a range limit to the active sort order
AddSortOrder[I]	add a sort order
AppendOrder[I]	refine the active sort order
SetProgressLimits	calibrate the StepClass progress monitor
Kill[V]	shut down the ProcessClass object

Mainstream Use:

Open[I]	open the view
Next[V]	get the next result set element
Previous[IV]	get the previous result set element
PrimeRecord[I]	prepare a record for adding
ValidateRecord[IV]	validate the current result set element
SetFilter[I]	specify a filter for the active sort order
SetSort[IV]	set the active sort order
ApplyFilter[I]	range limit and filter the result set
ApplyOrder[I]	sort the result set
ApplyRange[I]	conditionally range limit and filter the result set
Close[I]	close the view

Occasional Use:

GetFreeElementName[I]	return the free element field name
Reset[V]	reposition to the first result set element
SetOrder[IV]	replace the active sort order

[I] These methods are inherited from the ViewManager class.
[V] These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Next	get the next result set element
Previous[I]	get the previous result set element
Reset	reposition to the first result set element
SetSort[I]	set the active sort order
ValidateRecord[I]	validate the current result set element
Kill	shut down the ProcessClass object

[I] These methods are inherited from the ViewManager class.

Init (initialize the ProcessClass object)

Init(*view, relationmanager* [*, progress txt*] [, *progress pct*] | [, *total records*] | **)**

|*, stepclass*, *free element* |

Init	Initializes the ProcessClass object.
view	The label of the VIEW to process.
relationmanager	The label of the *view*'s primary file RelationManager object.
progress txt	A numeric constant, variable, EQUATE, or expression that contains the control number of a text-based Window control. The ProcessClass uses this control to provide textual feedback to the end user. If omitted, *progress txt* defaults to zero (0) and the ProcessClass provides no textual feedback.
progress pct	The label of a BYTE variable whose contents indicates what percent of the process is completed. The ProcessClass periodically updates *progress pct* so it can be the USE variable for a PROGRESS control. If omitted, the ProcessClass provides no numeric feedback.
total records	A numeric constant, variable, EQUATE, or expression that contains the estimated number of records to process. The ProcessClass uses this value to calculate how much of the process is completed. You should use this parameter when you can easily estimate the number of records to be processed, that is, when the process is not dynamically filtered. If omitted, *totalrecords* defaults to zero.
stepclass	The label of a StepClass object to monitor the progress of the process. The ProcessClass uses this object to determine how much of the process is completed. You should use this parameter when you cannot easily estimate the number of records to be processed, that is, when the process is dynamically filtered.
free element	The label of the *view*'s free element field. The *stepclass* uses this field to determine how much of the process is completed. See *StepClass Methods--GetPercentile* for more information.

The **Init** method initializes the ProcessClass object. If you supply *total records* to process, the ProcessClass object calculates the progress of the process as a function of *total records* and the number of records processed so far. Otherwise, the ProcessClass object relies on the *stepclass* to calculate the progress of the process. See *StepClass Methods--GetPercentile* for more information.

Implementation: The Init method assigns *progress txt* to the PText property, reference assigns *progress pct* to the Percentile property, and assigns *total records* to the RecordsToProcess property. The Init method calls the ViewManager Init method.

Example:

```
 !initialize the ProcessClass object
 Process.Init( Process:View, |      !set the VIEW
        Relate:Client,       |      !set the primary file RelationManager
        ?PctText,            |      !set the Window control for text messages
        PctDone,             |      !set the PROGRESS USE variable
        ProgressMgr,         |      !set StepClass object to monitor progress
        CLI:Name)                   !set StepClass free element to monitor
```

See Also: Percentile, PText, RecordsToProcess, ViewManager.Init

Kill (shut down the ProcessClass object)

Kill, VIRTUAL

The **Kill** method shuts down the ProcessClass object by freeing any memory allocated during the life of the object and executing any other required termination code.

Implementation: The Kill method calls the ViewManager.Kill method.

Example:

```
!initialize the ProcessClass object
Process.Init( Process:View,  |      !set the VIEW
       Relate:Client,        |      !set the primary file RelationManager
       ?PctText,             |      !set the Window control for text messages
       PctDone,              |      !set the PROGRESS USE variable
       ProgressMgr,          |      !set StepClass object to monitor progress
       CLI:Name)                    !set StepClass free element to monitor
!procedure code
Process.Kill                        !shut down the ProcessClass object
```

See Also: ViewManager.Kill

Next (get next element)

Next([*process records*] **), VIRTUAL**

Next Gets the next element in the result set.

process records A boolean constant, variable, EQUATE, or expression that tells the ProcessClass object whether to update its progress indicators. A zero (0) value does not update the progress indicators; any other value does update the indicators. If omitted, *process records* defaults to one (1).

The **Next** method gets the next element in the result set and returns a value indicating its success or failure.

Implementation: The Next method calls the ViewManager.Next method. The ProcessClass.Next method updates both the RecordsProcessed property and the Percentile property.

Return Data Type: BYTE

Example:

```
ACCEPT
 CASE EVENT()
 OF Event:OpenWindow
  Process.Reset                   !position to first record
  IF Process.Next()               !get first record
   POST(Event:CloseWindow)        !if no records, shut down
   CYCLE
  END
 OF Event:Timer                   !process records with timer
  StartOfCycle=Process.RecordsProcessed
  LOOP WHILE Process.RecordsProcessed-StartOfCycle<RecordsPerCycle
   CASE Process.Next()             !get next record
   OF Level:Notify                 !if end of file
    MESSAGE('Process Completed')   ! tell end user
    POST(EVENT:CloseWindow)        ! and shut down
    BREAK
   OF Level:Fatal                  !if fatal error
    POST(EVENT:CloseWindow)        ! shut down
    BREAK
   END
  END
 END
END
```

See Also: Percentile, RecordsProcessed, ViewManager.Next

Reset (position to the first element)

Reset, VIRTUAL

The **Reset** method postions the process to the first element in the result set and resets the progress indicators.

Implementation: The Reset method resets the RecordsProcessed property to zero (0), conditionally calls the SetProgressLimits method, then calls the ViewManager.Reset method.

Example:

```
CASE EVENT()
OF Event:OpenWindow
 Process.Reset                !position to first record
 IF Process.Next()            !get first record
  POST(Event:CloseWindow)     !if no records, shut down
  CYCLE
 END
```

See Also: SetProgressLimits, ViewManager.Reset

SetProgressLimits (calibrate the progress monitor)

SetProgressLimits

The **SetProgressLimits** method supplies the upper and lower boundaries of the result set--considering the active sort order, range limits, and filters--to the StepClass object that monitors the progress of the process.

The Init method specifies the StepClass object.

Implementation: The SetProgressLimits method assumes a StepClass object is specified. The Reset method conditionally calls the SetProgessLimits method. The SetProgressLimits method calls the StepClass.SetLimits method.

Example:

```
MyProcessClass.Reset PROCEDURE         !prepare to process the records
 CODE
 SELF.RecordsProcessed = 0             !set RecordsProcessed to 0
 SELF.SetProgressLimits                !set StepClass boundaries based
                                       ! on actual data processed
 PARENT.Reset                          !call ViewManager.Reset to
                                       !position to the first record
```

See Also: Init, Reset, StepClass.SetLimit

TakeLocate (a virtual to process each filter)

TakeLocate, VIRTUAL

The **TakeLocate** method does this.

Implementation: The ReportManager.TakeAccepted method calls the TakeLocate method for each report record.

Example:

```
ProcessClass.TakeLocate PROCEDURE
 CODE
  IF ~SELF.Query&=NULL AND SELF.Query.Ask()
   SELF.SetFilter(SELF.Query.GetFilter())
  END
```

TakeRecord (a virtual to process each report record)

TakeRecord, VIRTUAL, PROC

The **TakeRecord** method is a virtual placeholder to process each record in the result set. It returns a value indicating whether processing should continue or should stop. TakeRecord returns Level:Benign to indicate processing should continue normally; it returns Level:Notify to indicate processing is completed and should stop.

Implementation: The ReportManager.TakeWindowEvent method calls the TakeRecord method for each report record. For a report, the TakeRecord method typically implements any DETAIL specific filters and PRINTs the unfiltered DETAILs for the ReportManager. For a process, the TakeRecord method typically implements any needed record action for the Process.

Return Data Type: BYTE

Example:

```
ThisWindow.TakeRecord PROCEDURE()
 CODE
 IF ORD:Date = TODAY()
  PRINT(RPT:detail)
 END
 RETURN Level:Benign
```

See Also: ReportManager.TakeWindowEvent

QueryClass

QueryClass Overview

The QueryClass provides support for ad hoc queries against Clarion VIEWs. The query support includes a flexible user input dialog, a broad variety of search capabilities, and seamless integration with the BrowseClass. The QueryClass provides the following features:

- flexible user input dialog
- runtime setup of queryable fields
- queries against calculated fields (e.g., Qty*Price>100)
- case sensitive or insensitive searches
- "begins with" searches
- "contains anywhere" searches
- exclusive searches (not equal, greater than, less than)
- inclusive searches (equal, greater than or equal, less than or equal)
- ranged searches (greater than low value AND less than high value)
- persistent queries for stepwise refinement of queries

QueryClass Concepts

Use the AddItem method to define a standard user input dialog at runtime. Or create a custom dialog to plug into your QueryClass object. Use the Ask method to solicit end user query input or use the SetLimit method to programmatically set query search values. Finally, use the GetFilter method to build the filter expression to apply to your VIEW. You can apply the resulting filter with the ViewManager.SetFilter method, or directly with the PROP:Filter property.

QueryClass Relationship to Other Application Builder Classes

The classes derived from the QueryClass are optionally used by the BrowseClass. Therefore, if your BrowseClass object uses a QueryClass object, it must instantiate the QueryClass object.

The BrowseClass automatically provides a default query dialog that solicits end user search values for each field displayed in the browse list. See the Conceptual Example.

QueryClass ABC Template Implementation

The ABC Templates do not instantiate the QueryClass object independently. The templates instantiate the derived QueryFormClass instead.

Tip: Use the BrowseQBEButton control template to add a QueryFormClass object to your template generated BrowseBoxes.

QueryClass Source Files

The QueryClass source code is installed by default to the Clarion \LIBSRC folder. The specific QueryClass files and their respective components are:

ABQUERY.INC	QueryClass declarations
ABQUERY.CLW	QueryClass method definitions

QueryClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a QueryClass object and related objects. The example plugs a QueryClass into a BrowseClass object. The QueryClass object simply filters on the current record.

Note that the WindowManager and BrowseClass objects internally handle the normal events surrounding the query.

```
 PROGRAM

_ABCDllMode_ EQUATE(0)
_ABCLinkMode_ EQUATE(1)
 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABQUERY.INC')

 MAP
 END

GlobalErrors   ErrorClass
Access:Customer CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Customer CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END

GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest     LONG(0),THREAD

Customer       FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
CustomerIDKey   KEY(CUS:ID),NOCASE,OPT,PRIMARY
NameKey         KEY(CUS:LastName),NOCASE,OPT
Record          RECORD,PRE()
ID               LONG
LastName         STRING(20)
FirstName        STRING(15)
City             STRING(20)
State            STRING(2)
ZIP              STRING(10)
                 END
                END
```

```
CustView    VIEW(Customer)
            END

CustQ         QUEUE
CUS:LastName   LIKE(CUS:LastName)
CUS:FirstName  LIKE(CUS:FirstName)
CUS:ZIP        LIKE(CUS:ZIP)
CUS:State      LIKE(CUS:State)
ViewPosition   STRING(1024)
              END
CusWindow    WINDOW('Browse Customers'),AT(,,210,105),IMM,SYSTEM,GRAY
              LIST,AT(5,5,200,80),USE(?CusList),IMM,HVSCROLL,FROM(CustQ),|
              FORMAT('80L(2)|M~Last~@s20@64L(2)|M~First~@s15@44L(2)|M~ZIP~@s10@')
              BUTTON('&Zoom In'),AT(50,88),USE(?Query)
              BUTTON('Close'),AT(90,88),USE(?Close)
             END

ThisWindow  CLASS(WindowManager)    !declare ThisWindow object
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
            END

Query     QueryClass                !declare Query object
BRW1      CLASS(BrowseClass)        !declare BRW1 object
Q         &CustQ
          END
 CODE
 GlobalErrors.Init
 Relate:Customer.Init
 GlobalResponse = ThisWindow.Run()  !ThisWindow handles all events
 Relate:Customer.Kill
 GlobalErrors.Kill

ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?CusList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(?Close,RequestCancelled)
 Relate:Customer.Open
 BRW1.Init(?CusList,CustQ.ViewPosition,CustView,CustQ,Relate:Customer,ThisWindow)
 OPEN(CusWindow)
 SELF.Opened=True
 Query.Init                          !initialize the Query object
```

```
 BRW1.Q &= CustQ
 BRW1.AddSortOrder(,CUS:NameKey)
 BRW1.AddField(CUS:LastName,BRW1.Q.CUS:LastName)
 BRW1.AddField(CUS:FirstName,BRW1.Q.CUS:FirstName)
 BRW1.AddField(CUS:ZIP,BRW1.Q.CUS:ZIP)
 BRW1.QueryControl = ?Query          !register Query button w/ BRW1
 BRW1.UpdateQuery(Query)             !make each BRW1 field queryable
 Query.AddItem('CUS:State','')       !make State field queryable too
 SELF.SetAlerts()
 RETURN ReturnValue



ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:Customer.Close
 RETURN ReturnValue

Access:Customer.Init PROCEDURE
 CODE
 PARENT.Init(Customer,GlobalErrors)
 SELF.FileNameValue = 'Customer'
 SELF.Buffer &= CUS:Record
 SELF.Create = 1
 SELF.AddKey(CUS:CustomerIDKey,'CUS:CustomerIDKey',1)
 SELF.AddKey(CUS:NameKey,'CUS:NameKey',0)

Relate:Customer.Init PROCEDURE
 CODE
 Access:Customer.Init
 PARENT.Init(Access:Customer,1)

Relate:Customer.Kill PROCEDURE
 CODE
 Access:Customer.Kill
 PARENT.Kill
```

QueryClass Properties

The QueryClass contains the following properies:

QKCurrentQuery (popup menu choice)

QKCurrentQuery CSTRING(100)

The **QKCurrentQuery** property holds the value of the popup menu item if QuickQBE support is enabled.

QKIcon (icon for popup submenu)

QKIcon CSTRING(255)

The **QKIcon** property holds the full pathname of the icon file to be used in the QuickQBE submenu items.

QKMenuIcon (icon for popup menu)

QKMenuIcon CSTRING(255)

The **QKMenuIcon** property holds the full pathname of the icon file to be in the popup menu if QuickQBE has been enabled.

QKSupport (quickqbe flag)

QKSupport BYTE

The **QKSupport** property indicates that QuickQBE support is enabled.

Window (browse window:QueryClass)

Window &Window

The **Window** property is a reference to the QBE dialog window.

QueryClass Methods

The QueryClass contains the following methods:

QueryClass Functional Organization--Expected Use

As an aid to understanding the QueryClass, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the QueryClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the QueryClass object
AddItem	add a field to query
Kill[v]	shut down the QueryClass object

Mainstream Use:

Ask[v]	a virtual to accept query criteria
GetFilter	return filter expression

Occasional Use:

Reset	reset the QueryClass object
GetLimit	get searchvalues
SetLimit	set search values

These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--other ABC Library methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Ask	a virtual to accept query criteria
Kill	shut down the QueryClass object

AddItem (add field to query)

AddItem(*name, title* [*,picture*] **)**

AddItem	Adds specific functionality to the QueryClass.
name	A string constant, variable, EQUATE, or expression containing the queryable item, typically the fully qualified name of a field in the view being queried.

Tip: This may also be an expression such as *UPPER(field1*) or *field1 * field2*.

title	A string constant, variable, EQUATE, or expression containing the text to associate with the queryable item. This text appears as the prompt or header for the item in the query dialog presented to the end user.
picture	A string constant, variable, EQUATE, or expression containing the display picture for the queryable item. If omitted, *picture* defaults to S255 (unformatted string). See *Picture Tokens* in the *Language Reference* for more information.

The **AddItem** method adds a queryable item to the QueryClass object. The QueryClass object can then accept input for the item from the end user and build a filter expression to apply to the view being queried.

Other QueryClass methods, such as GetLimit and SetLimit, refer to the queryable item by its *name*.

Tip: You may use the BrowseClass.UpdateQuery method in combination with the AddItem method to define a query interface that contains the BrowseClass fields plus other queryable items.

Example:

```
QueryForm  QueryFormClass
QueryVis   QueryFormVisual
BRW1     CLASS(BrowseClass)
Q        &CusQ
         END

CusWindow.Init PROCEDURE()
  CODE
 !open files, views, window, etc.
  BRW1.UpdateQuery(QueryForm)                    !add browse fields to query
  QueryForm.AddItem('UPPER(CUS:NAME)','Name')    !add caseless name to query
  QueryForm.AddItem('CUS:ZIP_CODE','Name')       !add zip code to query
  QueryForm.AddItem('ITM:Qty+ITM:Price','Total')!add dynamic total to query
 END
 RETURN Level:Benign
```

See Also: BrowseClass.UpdateQuery

Ask (a virtual to accept query criteria)

Ask([*uselast*] **), VIRTUAL, PROC**

Ask	A virtual to accept query criteria (search values) from the end user.
uselast	An integer constant, variable, EQUATE, or expression that determines whether the QueryClass object carries forward previous query criteria. A value of one (1 or True) carries forward input from the previous query; a value of zero (0 or False) discards previous input.

The **Ask** method is a virtual to display a query dialog, process its events, and return a value indicating whether to apply the query or abandon it. A return value of Level:Notify indicates the QueryClass object should apply the query criteria; a return value of Level:Benign indicates the end user cancelled the query input dialog and the QueryClass object should not apply the query criteria.

The GetFilter method generates filter expressions using the search values set by the Ask method.

Implementation: For each item that can be queried (added by the AddItem method), the Ask method collects the query values from the selected item's file buffers rather than from a query input dialog. This default behavior automatically gives you query criteria (search values) for the current item without soliciting input from the end user. This allows you to, for example, use a regular update form as a special kind of query (QBE) form.

Return Data Type: BYTE

Example:

```
MyQueryForm.Ask PROCEDURE(BYTE UseLast)          !derived class Ask method
W  WINDOW('Example values'),CENTER,SYSTEM,GRAY   !declare user input dialog
   BUTTON('&OK'),USE(?Ok,1000),DEFAULT
   BUTTON('Cancel'),USE(?Cancel,1001)
  END
 CODE
 OPEN(W)
 IF ~UseLast THEN SELF.Reset().                  !preserve or discard prior query
 IF SELF.Win.Run()=RequestCancelled              !show dialog and handle events
  RETURN Level:Benign                            !return Cancel indicator
 ELSE
  RETURN Level:Notify                            !return OK indicator
 END
```

See Also: AddItem, GetFilter, QueryFormClass.Ask, QueryFormClass

ClearQuery (remove loaded query)

ClearQuery, PROTECTED

The **ClearQuery** method clears the listbox on the QueryVisual dialog that contains the currently loaded query.

Implementation: The ClearQuery method is called by the Take, Restore, and QueryVisual.TakeAccepted methods. This mehtod is used by the QuickQBE functionality.

Note: The Clear Query method does not remove the ad hoc filter from a Browse procedure. It only affects the query dialog used for managing a Browse's queries.

Example:

```
QueryClass.Take PROCEDURE(PopupClass P)
 CODE
 ASSERT(~P &= NULL)
 IF SELF.QkSupport
    SELF.QkCurrentQuery = P.GetLastSelection()
    SELF.PopupList.PopupID = SELF.QkCurrentQuery
    GET(SELF.PopupList,SELF.PopupList.PopupID)
    IF Errorcode()
       SELF.ClearQuery()
    ELSE
       SELF.Restore(SELF.PopupList.QueryName)
    END
    SELF.Save('tsMRU') ! Save Most recently used for Browse\Report query sharing.
    RETURN 1
 END
 RETURN 0
```

See Also: Save

Delete (remove saved query)

Delete (*queryname*), PROTECTED

Delete	Remove a saved query.
queryname	A string constant, variable, EQUATE or expression containing the name of a saved query.

Implementation: The Delete method is the mechanism by which the QuickQBE queries are deleted. This method is called when the user presses the Delete button on the Query dialog.

Note: The Delete method is primarily designed for use by the QuickQBE functionality.

See Also: Save

GetFilter (return filter expression)

GetFilter

The **GetFilter** method returns a filter expression. The GetFilter method builds the expression from values supplied by the AddItem, Ask, and SetLimit methods.

Implementation: The returned filter expression is up to 5000 characters long.

The GetFilter method generates filter expressions using the search values set by the Ask method, the SetLimit method, or both.

Tip: By default, the Ask method only sets the *equal* to value; it does not set lower and upper values.

The generated filter expression searches for values greater than *lower*, less than *upper*, and equal to *equal*. For string fields, the GetFilter method applies the following special meanings to these special search characters:

Symbol	Position	Filter Effect
^	prefix	caseless (case insensitive) search
*	prefix	contains search
*	suffix	begins with search
=	prefix	inclusive search
>	prefix	exclusive search--greater than
<	prefix	exclusive search--less than

For example:

lower	*upper*	*equal*	query searches for
fred			values > fred
	fred		values < fred
		fred	values = fred
=fred			values >= fred
	=fred		values <= fred
		>fred	values >= fred
fred	fred		values >= fred
fred	george	george	values <= george AND values > fred
		d*	values beginning with d (e.g., dog, david)
		*d	values containing d (e.g., dog, cod)
		^d	values d and D
		^d*	values beginning with d or D (e.g., dog, David)
		^*d	values containing d or D (e.g., dog, cod, coD)

Return Data Type: STRING

Example:

```
MyBrowseClass.TakeLocate PROCEDURE
CurSort  USHORT,AUTO
I        USHORT,AUTO
 CODE
 IF ~SELF.Query&=NULL AND SELF.Query.Ask()    !get query input from end user
  CurSort = POINTER(SELF.Sort)           !save current sort order
  LOOP I = 1 TO RECORDS(SELF.Sort)
   PARENT.SetSort(I)                     !step thru each sort order
   SELF.SetFilter(SELF.Query.GetFilter(),'9-QBE') !get filter expression from
Query
  END                                    ! and give it to Browse object
  PARENT.SetSort(CurSort)                !restore current sort order
  SELF.ResetSort(1)                      !apply the filter expression
 END
```

See Also: AddItem, Ask, SetLimit

GetLimit (get searchvalues)

GetLimit(*name* [,*lower*] [,*upper*] [,*equal*] **), PROTECTED**

GetLimit	Gets the QueryClass object's search values.
name	A string constant, variable, EQUATE, or expression containing the queryable item to set. Queryable items are established by the AddItem method.
lower	A CSTRING variable to receive the filter's lower boundary.
upper	A CSTRING variable to receive the filter's upper boundary.
equal	A CSTRING variable to receive the filter's exact match.

The **GetLimit** method gets the QueryClass object's search values. The Ask or SetLimit methods set the QueryClass object's search values.

Implementation: The GetFilter method generates filter expressions using the search values. The generated filter expression searches for values greater than *lower*, less than *upper*, and equal to *equal*.

Example:

```
QueryClass.Ask       PROCEDURE(BYTE UseLast=1)
I USHORT,AUTO
EV CSTRING(1000),AUTO
  CODE
    SELF.Reset
    LOOP I = 1 TO RECORDS(SELF.Fields)
      GET(SELF.Fields,I)
      EV = CLIP(EVALUATE(SELF.Fields.Name))
      IF EV
        SELF.SetLimit(SELF.Fields.Name,,,EV)
      END
    END
    RETURN Level:Notify
```

See Also: AddItem, Ask, SetLimit

Init (initialize the QueryClass object)

Init([*queryvisual*] [,*inimanager*,*family*,*errormanage*]

Init	The **Init** method initializes the QueryClass object.
queryvisual	The label of the query's QueryVisual object.
inimanager	The label of the query's INIManager object.
family	A string constant, variable, EQUATE, or expression that specifies the name to use for storing queries. By default this is the name of the procedure.
errormanager	The label of the query's ErrorManager object

Implementation: The Init method allocates a new queryable items queue.

Example:

```
ThisWindow.Init PROCEDURE()
ReturnValue BYTE,AUTO
  CODE
!other initialization code
  Query.Init(QueryWindow)
  Query.AddItem('UPPER(CLI:LastName)','Name','s20')
  Query.AddItem('CLI:ZIP+1','ZIP+1','')
  RETURN ReturnValue
  ThisWindow.Kill PROCEDURE()
  ReturnValue BYTE,AUTO
  CODE
!other termination code
  Query.Kill
  RETURN ReturnValue
```

See Also: Kill

Kill (shut down the QueryClass object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Implementation: The Kill method deallocates the queryable items queue.

Example:

```
ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other initialization code
  Query.Init(QueryWindow)
  Query.AddItem('UPPER(CLI:LastName)','Name','s20')
  Query.AddItem('CLI:ZIP+1','ZIP+1','')
  RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other termination code
  Query.Kill
  RETURN ReturnValue
```

See Also: Init

Reset (reset the QueryClass object)

Reset([*name*] **)**

Reset	Resets the QueryClass object.
name	A string constant, variable, EQUATE, or expression containing the queryable item to reset. Queryable items are established by the AddItem method. If omitted, the Reset method resets all the queryable items.

The **Reset** method resets the QueryClass object by clearing prior query values.

Implementation: The Reset method calls the SetLimit method to clear the search values for each queryable item.

Example:

```
MyQueryForm.Ask PROCEDURE(BYTE UseLast)          !derived class Ask method
W  WINDOW('Example values'),CENTER,SYSTEM,GRAY   !declare user input dialog
   BUTTON('&OK'),USE(?Ok,1000),DEFAULT
   BUTTON('Cancel'),USE(?Cancel,1001)
  END
 CODE
 OPEN(W)
 IF ~UseLast THEN SELF.Reset().                  !preserve or discard prior query
 IF SELF.Win.Run()=RequestCancelled              !show dialog and handle events
  RETURN Level:Benign                            !return Cancel indicator
 ELSE
  RETURN Level:Notify                            !return OK indicator
```

See Also: AddItem, SetLimit

Restore (retrieve saved query)

Restore (*queryname*)

Restore	The **Restore** method retrieves a saved query from the INI file.
queryname	A string constant, variable, EQUATE or expression containing the name of a saved query.

Implementation: The Restore method is called by the Take, QueryVisual.TakeAccepted, and QueryVisual.TakeFieldEvent methods.

Note: The Restore method is primarily designed for use by the QuickQBE functionality.

See Also: Save

Save (save a query)

Save (*queryname*)

Save	The **Save** method saves a query to the INI file.
queryname	A string constant, variable, EQUATE or expression containing the name of the query to save.

Implementation: The Kill method deallocates the queryable items queue.

Note: The save method is primarily designed for use by the QuickQBE functionality.

See Also: Restore

SetLimit (set search values)

SetLimit(*name* [,*lower*] [,*upper*] [,*equal*] **)**

SetLimit	Sets the QueryClass object's search values.
name	A string constant, variable, EQUATE, or expression containing the queryable item to set. Queryable items are established by the AddItem method.
lower	A string constant, variable, EQUATE, or expression that specifies the filter's lower boundary--the query searches for values greater than *lower*. If you prefix the lower value with the equal sign (=), the query searches for values greater than or equal to *lower*. If omitted, SetLimit leaves the lower boundary intact.
upper	A string constant, variable, EQUATE, or expression that specifies the filter's upper boundary--the query searches for values less than *upper*. If you prefix the *upper* value with the equal sign (=), the query searches for values less than or equal to *upper*. If omitted, SetLimit leaves the upper boundary intact.
equal	A string constant, variable, EQUATE, or expression that specifies the filter's exact match--the query searches for values equal to *equal*. If you prefix the *equal* value with the greater sign (>), the query searches for values greater than or equal to *equal*; if you prefix the *equal* value with the less sign (<), the query searches for values less than or equal to *equal*. If omitted, SetLimit leaves the exact match intact.

The **SetLimit** method sets the QueryClass object's search values. The GetLimit method gets the QueryClass object's search values.

Implementation: The GetFilter method generates filter expressions using the search values set by the Ask method, the SetLimit method, or both.

Tip: By default, the Ask method only sets the *equal* to value; it does not set lower and upper values.

The generated filter expression searches for values greater than *lower*, less than *upper*, and equal to *equal*. For string fields, the GetFilter method applies the following special meanings to these special search characters:

Symbol	Position	Filter Effect
^	prefix	caseless (case insensitive) search
*	prefix	contains search
*	suffix	begins with search
=	prefix	inclusive search
>	prefix	exclusive search--greater than
<	prefix	exclusive search--less than

For example:

lower	*upper*	*equal*	query searches for
fred			values > fred
	fred		values < fred
		fred	values = fred
=fred			values >= fred
	=fred		values <= fred
		>fred	values >= fred
fred	fred		values >= fred
fred	george	george	values <= george AND values > fred
		d*	values beginning with d (e.g., dog, david)
		*d	values containing d (e.g., dog, cod)
		^d	values d and D
		^d*	values beginning with d or D (e.g., dog, David)
		^*d	values containing d or D (e.g., dog, cod, coD)

Example:

```
QueryClass.Ask       PROCEDURE(BYTE UseLast=1)
I USHORT,AUTO
EV CSTRING(1000),AUTO
  CODE
    SELF.Reset
    LOOP I = 1 TO RECORDS(SELF.Fields)
      GET(SELF.Fields,I)
      EV = CLIP(EVALUATE(SELF.Fields.Name))
      IF EV
        SELF.SetLimit(SELF.Fields.Name,,,EV)
      END
    END
    RETURN Level:Notify
```

See Also: AddItem, Ask, GetFilter, GetLimit

SetQuickPopup (add QuickQBE to browse popup)

SetQuickPopup (*popup, query*)

SetQuickPopup	Add QuickQBE items and submenu to Browse popup.
popup	A string constant, variable, EQUATE, or expression containing the label of the browse PopupManager object.
query	A string constant, variable, EQUATE, or expression containing the label of the QueryClass object

Implementation: The SetQuickPopup method adds a submenu to the BroweClass popup object, and an item to clear the current query and an item for every saved query for the current procedure.

Note: TheSetQuickPopup method is primarily designed for use by the QuickQBE functionality.

See Also: QkIcon, QkMenuIcon, BrowseClass.Popup, Save

Take (process QuickQBE popup menu choice)

Take (*popup*)

Take	Add QuickQBE items and submenu to Browse popup.
popup	A string constant, variable, EQUATE, or expression containing the label of the browse PopupManager object.

Implementation: The Take method is called by the BrowseClass.TakeEvent method. It returns one (1 or True) if QuickQBE support is enabled, and zero (0 or False) if QuickQBE is not enabled.

Note: The take method is primarily designed for use by the QuickQBE functionality.

Return Data Type: BYTE

See Also: QkSupport

QueryFormClass

QueryFormClass Overview

The QueryFormClass is a QueryClass with a "form" user interface. The QueryFormClass provides support for ad hoc queries against Clarion VIEWs. The form interface includes an entry field, a prompt, and an equivalence operator (equal, not equal, greater than, etc.) button for each queryable item.

QueryFormClass Concepts

Use the AddItem method to define a user input dialog at runtime. Or create a custom dialog to plug into your QueryClass object. Use the Ask method to solicit end user query criteria (search values) or use the SetLimit method to programmatically set query search values. Finally, use the GetFilter method to build the filter expression to apply to your VIEW. Use the ViewManager.SetFilter method or the PROP:Filter property to apply the resulting filter.

QueryFormClass Relationship to Other Application Builder Classes

The QueryFormClass is derived from the QueryClass, plus it relies on the QueryFormVisual class to display its input dialog and handle the dialog events.

The BrowseClass optionally uses the QueryFormClass to filter its result set. Therefore, if your BrowseClass object uses a QueryFormClass object, it must instantiate the QueryFormClass object and the QueryFormVisual object.

The BrowseClass automatically provides a default query dialog that solicits end user search values for each field displayed in the browse list. See the Conceptual Example.

QueryFormClass ABC Template Implementation

The ABC Templates declare a local QueryFormClass class *and* object for each instance of the BrowseQBEButton template. The ABC Templates automatically include all the code necessary to support the functionality specified in the BrowseQBEButton template.

The templates optionally *derive* a class from the QueryFormClass for *each* BrowseQBEButton control in the application. The derived class is called QBE# where # is the instance number of the BrowseQBEButton template. The templates provide the derived class so you can use the BrowseQBEButton template **Classes** tab to easily modify the query's behavior on an instance-by-instance basis.

Tip: Use the BrowseQBEButton control template to add a QueryFormClass object to your template generated BrowseBoxes.

QueryFormClass Source Files

The QueryFormClass source code is installed by default to the Clarion \LIBSRC folder. The specific QueryFormClass files and their respective components are:

ABQUERY.INC	QueryFormClass declarations
ABQUERY.CLW	QueryFormClass method definitions

QueryFormClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a QueryFormClass object and related objects. The example plugs a QueryFormClass into a BrowseClass object. The QueryFormClass object solicits query criteria (search values) with a "form" dialog, and then generates a filter expression based on the end user input.

Note that the WindowManager and BrowseClass objects internally handle the normal events surrounding the query.

```
  PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)
 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABQUERY.INC')

   MAP
   END

GlobalErrors  ErrorClass
Access:Customer CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Customer CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END
GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest     LONG(0),THREAD

Customer    FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
CustomerIDKey  KEY(CUS:ID),NOCASE,OPT,PRIMARY
NameKey        KEY(CUS:LastName),NOCASE,OPT
Record         RECORD,PRE()
ID              LONG
LastName        STRING(20)
FirstName       STRING(15)
City            STRING(20)
State           STRING(2)
ZIP             STRING(10)
              END
            END
```

```
CustView    VIEW(Customer)
            END

CustQ         QUEUE
CUS:LastName   LIKE(CUS:LastName)
CUS:FirstName  LIKE(CUS:FirstName)
CUS:ZIP        LIKE(CUS:ZIP)
ViewPosition   STRING(1024)
              END

CusWindow  WINDOW('Browse Customers'),AT(,,210,105),IMM,SYSTEM,GRAY
            LIST,AT(5,5,200,80),USE(?CusList),IMM,HVSCROLL,FROM(CustQ),|
            FORMAT('80L(2)|M~Last~@s20@64L(2)|M~First~@s15@44L(2)|M~ZIP~@s10@')
            BUTTON('&Query'),AT(50,88),USE(?Query)
            BUTTON('Close'),AT(90,88),USE(?Close)
           END

ThisWindow  CLASS(WindowManager)          !declare ThisWindow object
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
            END

Query     QueryFormClass                  !declare Query object
QBEWindow  QueryFormVisual                !declare QBEWindow object
BRW1     CLASS(BrowseClass)               !declare BRW1 object
Q        &CustQ
         END
 CODE
 GlobalErrors.Init
 Relate:Customer.Init
 GlobalResponse = ThisWindow.Run()        !ThisWindow handles all events
 Relate:Customer.Kill
 GlobalErrors.Kill


ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?CusList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(?Close,RequestCancelled)
 Relate:Customer.Open
 BRW1.Init(?CusList,CustQ.ViewPosition,CustView,CustQ,Relate:Customer,ThisWindow)
 OPEN(CusWindow)
```

```
  SELF.Opened=True
  Query.Init(QBEWindow)                    !initialize Query object
  BRW1.Q &= CustQ
  BRW1.AddSortOrder(,CUS:NameKey)
  BRW1.AddField(CUS:LastName,BRW1.Q.CUS:LastName)
  BRW1.AddField(CUS:FirstName,BRW1.Q.CUS:FirstName)
  BRW1.AddField(CUS:ZIP,BRW1.Q.CUS:ZIP)
  BRW1.QueryControl = ?Query               !register Query button w/ BRW1
  BRW1.UpdateQuery(Query)                  !make each browse item Queryable
  Query.AddItem('Cus:State','State')       !make State field Queryable too
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  IF ReturnValue THEN RETURN ReturnValue.
  Relate:Customer.Close
  RETURN ReturnValue

Access:Customer.Init PROCEDURE
  CODE
  PARENT.Init(Customer,GlobalErrors)
  SELF.FileNameValue = 'Customer'
  SELF.Buffer &= CUS:Record
  SELF.Create = 1
  SELF.AddKey(CUS:CustomerIDKey,'CUS:CustomerIDKey',1)
  SELF.AddKey(CUS:NameKey,'CUS:NameKey',0)

Relate:Customer.Init PROCEDURE
  CODE
  Access:Customer.Init
  PARENT.Init(Access:Customer,1)

Relate:Customer.Kill PROCEDURE
  CODE
  Access:Customer.Kill
  PARENT.Kill
```

QueryFormClass Properties

The QueryFormClass inherits all the properties of the *QueryClass* from which it is derived.

QueryFormClass Methods

The QueryFormClass inherits all the methods of the QueryClass from which it is derived. See *QueryClass Methods* for more information.

QueryFormClass Functional Organization--Expected Use

As an aid to understanding the QueryFormClass, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the QueryFormClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the QueryFormClass object
AddItem[I]	add a field to query
Kill[V]	shut down the QueryFormClass object

Mainstream Use:

Ask[V]	accept query criteria
GetFilter[I]	return filter expression

Occasional Use:

Reset[I]	reset the QueryFormClass object
GetLimit[I]	get searchvalues
SetLimit[I]	set search values

[V] These methods are also Virtual.

[I] These methods are inherited from the QueryClass.

Virtual Methods

Typically you will not call these methods directly--other ABC Library methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Ask	accept query criteria
Kill	shut down the QueryFormClass object

Ask (solicit query criteria)

Ask([*uselast*] **), VIRTUAL, PROC**

Ask	Accepts query criteria (search values) from the end user.
uselast	An integer constant, variable, EQUATE, or expression that determines whether the QueryFormClass object carries forward previous query criteria. A value of one (1 or True) carries forward input from the previous query; a value of zero (0 or False) discards previous input.

The **Ask** method displays a query dialog, processes its events, and returns a value indicating whether to apply the query or abandon it. A return value of Level:Notify indicates the QueryFormClass object should apply the query criteria; a return value of Level:Benign indicates the end user cancelled the query input dialog and the QueryFormClass object should not apply the query criteria.

Implementation: The Ask method declares a generic (empty) dialog to accept query criteria. The Ask method calls the QueryFormClass object's WindowManager to define the dialog and process it's events.

The GetFilter method generates filter expressions using the search values set by the Ask method.

The Init method sets the value of the QueryFormClass object's WindowManager.

Return Data Type: BYTE

Example:

```
MyBrowseClass.TakeLocate PROCEDURE
CurSort USHORT,AUTO
I USHORT,AUTO
 CODE
 IF ~SELF.Query&=NULL AND SELF.Query.Ask()
  CurSort = POINTER(SELF.Sort)
  LOOP I = 1 TO RECORDS(SELF.Sort)
   PARENT.SetSort(I)
   SELF.SetFilter(SELF.Query.GetFilter(),'9 - QBE')
  END
  PARENT.SetSort(CurSort)
  SELF.ResetSort(1)
 END
```

See Also: GetFilter, Init, QueryFormVisual

Init (initialize the QueryFormClass object)

Init(*query window manager, inimanager, family, errormanager* **)**

Init	Initializes the QueryFormClass object.
query window manager	The label of the QueryFormVisual object that displays the query input dialog and processes it's events.
inimanager	The label of the INIManager object.
family	A string constant, variable, EQUATE, or expression containing the procedure name of the calling procedure.
errormanager	The label of the Global ErrorManager object.

The **Init** method initializes the QueryFormClass object.

Implementation: The Init method sets the QFC property for the *query window manager*.

Example:

```
ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other initialization code
  Query.Init(QueryWindow)
  Query.AddItem('UPPER(CLI:LastName)','Name','s20')
  Query.AddItem('CLI:ZIP+1','ZIP+1','')
  RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other termination code
  Query.Kill
  RETURN ReturnValue
```

See Also: Kill, QueryFormVisual, QueryFormVisual.QFC

Kill (shut down the QueryFormClass object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Example:

```
ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other initialization code
  Query.Init(QueryWindow)
  Query.AddItem('UPPER(CLI:LastName)','Name','s20')
  Query.AddItem('CLI:ZIP+1','ZIP+1','')
  RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other termination code
  Query.Kill
  RETURN ReturnValue
```

See Also: Init

QueryFormVisual

QueryFormVisual Overview

The QueryFormVisual class is a QueryVisualClass that displays a query input dialog and handles the dialog events. The query dialog includes an entry field, a prompt, and an equivalence operator (equal, not equal, greater than, etc.) button for each queryable item.

QueryFormVisual Concepts

The QueryFormVisual provides the query window for a QueryFormClass object. The Init method defines and "programs" the query input dialog at runtime. The query input dialog contains a prompt, an entry field, and a query operator button for each queryable item. On each button press, the operator button cycles through the available operators: equal (=), greater than or equal (>=), less than or equal (<=), not equal (<>), and no filter ( ).

The QueryFormClass recognizes these operators and uses them to create valid filter expressions.

QueryFormVisual Relationship to Other Application Builder Classes

The QueryFormVisual class is derived from the QueryVisualClass.

The BrowseClass uses the QueryFormVisual to provide the user interface to its query facility. Therefore, if your BrowseClass object provides a query, it must instantiate the QueryFormVisual object (and the QueryFormClass object). See the Conceptual Example.

QueryFormVisual ABC Template Implementation

The ABC Templates declare a local QueryFormVisual class *and* object for each instance of the BrowseQBEButton template. The ABC Templates automatically include all the code necessary to support the functionality specified in the BrowseQBEButton template.

The templates optionally *derive* a class from the QueryFormVisual for *each* BrowseQBEButton control in the application. The derived class is called QBV# where # is the instance number of the BrowseQBEButton template. The templates provide the derived class so you can use the BrowseQBEButton template **Classes** tab to easily modify the query's behavior on an instance-by-instance basis.

Tip: Use the BrowseQBEButton control template to add a QueryFormClass object to your template generated BrowseBoxes.

QueryFormVisual Source Files

The QueryFormVisual source code is installed by default to the Clarion \LIBSRC folder. The specific QueryFormVisual files and their respective components are:

ABQUERY.INC	QueryFormVisual declarations
ABQUERY.CLW	QueryFormVisual method definitions

QueryFormVisual Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a QueryFormVisual object and related objects. The example plugs a QueryFormClass into a BrowseClass object. The QueryFormClass object uses the QueryFormVisual to solicit query criteria (search values) from the end user.

Note that the QueryVisualClass and BrowseClass objects internally handle the normal events surrounding the query.

```
 PROGRAM
_ABCDllMode_ EQUATE(0)
_ABCLinkMode_ EQUATE(1)

 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABQUERY.INC')

   MAP
   END

GlobalErrors  ErrorClass
Access:Customer CLASS(FileManager)
Init            PROCEDURE
                END


Relate:Customer CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END

GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest     LONG(0),THREAD

Customer       FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
CustomerIDKey   KEY(CUS:ID),NOCASE,OPT,PRIMARY
NameKey         KEY(CUS:LastName),NOCASE,OPT
Record          RECORD,PRE()
ID               LONG
LastName         STRING(20)
FirstName        STRING(15)
City             STRING(20)
State            STRING(2)
ZIP              STRING(10)
                 END
               END
```

```
CustView    VIEW(Customer)
            END

CustQ         QUEUE
CUS:LastName   LIKE(CUS:LastName)
CUS:FirstName  LIKE(CUS:FirstName)
CUS:ZIP        LIKE(CUS:ZIP)
ViewPosition   STRING(1024)
              END

CusWindow   WINDOW('Browse Customers'),AT(,,210,105),IMM,SYSTEM,GRAY
             LIST,AT(5,5,200,80),USE(?CusList),IMM,HVSCROLL,FROM(CustQ),|
             FORMAT('80L(2)|M~Last~@s20@64L(2)|M~First~@s15@44L(2)|M~ZIP~@s10@')
             BUTTON('&Query'),AT(50,88),USE(?Query)
             BUTTON('Close'),AT(90,88),USE(?Close)
            END

ThisWindow  CLASS(WindowManager)         !declare ThisWindow object
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
            END

Query     QueryFormClass                 !declare Query object
QBEWindow QueryFormVisual                !declare QBEWindow object
BRW1     CLASS(BrowseClass)              !declare BRW1 object
Q        &CustQ
         END
 CODE
 GlobalErrors.Init
 Relate:Customer.Init
 GlobalResponse = ThisWindow.Run()       !ThisWindow handles all events
 Relate:Customer.Kill
 GlobalErrors.Kill


ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?CusList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(?Close,RequestCancelled)
 Relate:Customer.Open
 BRW1.Init(?CusList,CustQ.ViewPosition,CustView,CustQ,Relate:Customer,ThisWindow)
 OPEN(CusWindow)
```

```
 SELF.Opened=True
 Query.Init(QBEWindow)                  !initialize Query object
 BRW1.Q &= CustQ
 BRW1.AddSortOrder(,CUS:NameKey)
 BRW1.AddField(CUS:LastName,BRW1.Q.CUS:LastName)
 BRW1.AddField(CUS:FirstName,BRW1.Q.CUS:FirstName)
 BRW1.AddField(CUS:ZIP,BRW1.Q.CUS:ZIP)
 BRW1.QueryControl = ?Query             !register Query button w/ BRW1
 BRW1.UpdateQuery(Query)                !make each browse item Queryable
 Query.AddItem('Cus:State','State')     !make State field Queryable too
 SELF.SetAlerts()
 RETURN ReturnValue


ThisWindow.Kill PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:Customer.Close
 RETURN ReturnValue

Access:Customer.Init PROCEDURE
 CODE
 PARENT.Init(Customer,GlobalErrors)
 SELF.FileNameValue = 'Customer'
 SELF.Buffer &= CUS:Record
 SELF.Create = 1
 SELF.AddKey(CUS:CustomerIDKey,'CUS:CustomerIDKey',1)
 SELF.AddKey(CUS:NameKey,'CUS:NameKey',0)

Relate:Customer.Init PROCEDURE
 CODE
 Access:Customer.Init
 PARENT.Init(Access:Customer,1)

Relate:Customer.Kill PROCEDURE
 CODE
 Access:Customer.Kill
 PARENT.Kill
```

QueryFormVisual Properties

The QueryFormVisual inherits all the properties of the QueryVisualClass from which it is derived. See QueryVisualClass properties for more information.

In addition to the inherited properties, the QueryFormVisual contains the following property:

QFC (reference to the QueryFormClass)

QFC &QueryFormClass

The **QFC** property is a reference to the QueryFormClass that uses this QueryFormVisual object to solicit query criteria (search values) from the end user.

Implementation: The QueryFormClass.Init method sets the QFC property.

See Also: QueryFormClass.Init

QueryFormVisual Methods

The QueryFormVisual inherits all the methods of the QueryVisualClass from which it is derived. See QueryVisualClass methods for more information.

QueryFormVisual Functional Organization--Expected Use

As an aid to understanding the QueryFormVisual class, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the QueryFormVisual methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Initv program the QueryFormVisual object

MainStream Use:

none

Occasional Use:

none

v These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--other ABC Library methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init	program the QueryFormVisual object
TakeCompleted	wrap up the query dialog
TakeAccepted	handle EVENT:Accepted events

GetButtonFeq(returns a field equate label)

GetButtonFeq(*index***)**

GetButtonFeq	Returns the field equate label of the starting set of QBE controls.
index	An integer constant, variable, EQUATE, or expression that contains an indexed value to the starting set of QBE controls

The **GetButtonFeq** method returns a field equate label which correponds to the starting set of QBE controls.

Implementation: The GetButtonFeq method is used in conjunction with the Web Builder template set. This method is called only if the WebServer.IsEnabled method returns a TRUE value.

Return Data Type: SIGNED

Init (initialize the QueryFormVisual object)

Init, VIRTUAL, PROC

The **Init** method initializes the QueryFormVisual object. Init returns Level:Benign to indicate normal initialization.

The Init method "programs" the QueryFormVisual object.

Implementation: The QueryFormClass.Ask method (indirectly) calls the Init method to configure the QueryFormClass WINDOW.

For each queryable item (defined by the QFC property), the Init method creates a series of window controls to accept search values. By default, each queryable item gets a prompt, an entry control, and an query operator button (equal, not equal, greater than, etc.).

The Init method sets the coordinates for the QueryFormClass WINDOW and for the individual controls.

Return Data Type: BYTE

Example:

```
MyQuery.Ask PROCEDURE(BYTE UseLast)
W    WINDOW('Query values'),GRAY   !declare an "empty" window
       BUTTON('&OK'),USE(?Ok,1000),DEFAULT
       BUTTON('Cancel'),USE(?Cancel,1001)
     END
  CODE
  OPEN(W)
  IF SELF.Win.Run()=RequestCancelled !configure, display & process query dialog
                     ! Win &= QueryFormVisual
                     ! Win.Run calls Init, Ask & Kill
                     ! Win.Init configures the dialog
                     ! Win.Ask displays dialog & handles events
                     ! Win.Kill shuts down the dialog
  RETURN Level:Notify
 ELSE
  RETURN Level:Benign
 END
```

See Also: QFC

ResetFromQuery (reset the QueryFormVisual object)

ResetFromQuery, DERIVED

The **ResetFromQuery** method resets the QueryFormVisual object after a query.

Implementation: The ResetFromQuery method calls the SetText method for each field available for query.

Example:

```
QueryFormVisual.ResetFromQuery PROCEDURE
I USHORT
 CODE
 LOOP I = 1 TO RECORDS(SELF.QFC.Fields)
  GET(SELF.QFC.Fields,I)
  SELF.SetText((Feq:StartControl+(I*3-1)),SELF.QFC.Fields.Middle)
 END
 Update()
 RETURN
```

See Also: SetText

SetText (set prompt text:QueryFormVisual)

SetText (*control, entrytext*)

SetText	The **SetText** method sets the prompt text for the QueryFormVisual object.
control	An integer constant, variable, EQUATE, or expression containing the control number of the control to act on.
entrytext	A string constant, variable, EQUATE, or expression containing the text to assign to the prompt.

Implementation: The ResetFromQuery method calls the SetText method for each field available for query.

Example:

```
QueryFormVisual.ResetFromQuery PROCEDURE
I USHORT
 CODE
 LOOP I = 1 TO RECORDS(SELF.QFC.Fields)
  GET(SELF.QFC.Fields,I)
  SELF.SetText((Feq:StartControl+(I*3-1)),SELF.QFC.Fields.Middle)
 END
 Update()
 RETURN
```

See Also: ResetFromQuery

TakeAccepted (handle query dialog Accepted events: QueryFormVisual)

TakeAccepted, VIRTUAL, PROC

The **TakeAccepted** method processes EVENT:Accepted events for the query dialog's controls, and returns a value indicating whether ACCEPT loop processing is complete and should stop. TakeAccepted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: For each item that can be queried(defined by the QFC property), the TakeAccepted method implements cycling of operators for the query operator buttons. On each button press, the button cycles through the available filter operators: equal(=), greater than or equal(>=), less than or equal(<=), not equal(<>), and no filter( ).

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: QFC

TakeCompleted (complete the query dialog: QueryFormVisual)

TakeCompleted, VIRTUAL, PROC

The **TakeCompleted** method processes the EVENT:Completed event for the query dialog and returns a value indicating whether window ACCEPT loop processing is complete and should stop.

TakeCompleted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Based on the current state of the querydialog, the TakeCompleted method sets the search values in the QFC property. The QFC property may use these search values to create a filter expresssion.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: QFC

TakeFieldEvent (a virtual to process field events:QueryFormVisual)

TakeFieldEvent, DERIVED, PROC

The **TakeFieldEvent** method is a virtual placeholder to process all field-specific/control-specific events for the window. It returns a value indicating whether window process is complete and should stop. TakeFieldEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Return values are declared in ABERROR.INC. The TakeEvent method calls the TakeFieldEvent method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I USHORT,AUTO
  CODE
  IF ~FIELD()
    RVal = SELF.TakeWindowEvent()
    IF RVal THEN RETURN RVal.
  END
  CASE EVENT()
    OF EVENT:Accepted; RVal = SELF.TakeAccepted()
    OF EVENT:Rejected; RVal = SELF.TakeRejected()
    OF EVENT:Selected; RVal = SELF.TakeSelected()
    OF EVENT:NewSelection;RVal = SELF.TakeNewSelection()
    OF EVENT:Completed; RVal = SELF.TakeCompleted()
    OF EVENT:CloseWindow OROF EVENT:CloseDown
    RVal = SELF.TakeCloseEvent()
  END
  IF RVal THEN RETURN RVal.
  IF FIELD()
    RVal = SELF.TakeFieldEvent()
  END
  RETURN Rval
```

See Also: WindowManager.Ask

UpdateFields (process query values)

UpdateFields, DERIVED

The **UpdateFields** method processes the values entereed into the query dialog for assignment to a filter statment.

Implementation: The TakeCompleted method calls the UpdateFields method.

Example:

```
QueryFormVisual.TakeCompleted   PROCEDURE
  CODE
  SELF.SetResponse(RequestCompleted)
  SELF.UpdateFields
  RETURN Level:Benign
```

See Also: TakeCompleted

QueryListClass

QueryListClass--Overview

The QueryListClass is a QueryClass with a "list" user interface. The QueryListClass provides support for ad hoc queries against Clarion VIEWs. The list interface includes is an edit-in-place, 3-column listbox with a field column, an equivalence operator (contains, begins, equal, not equal, greater than, less than) column, and a value (to query for) column.

QueryListClass Concepts

Use the AddItem method to define a user input dialog at runtime. Or create a custom dialog to plug into your QueryClass object. Use the Ask method to solicit end user query criteria (search values) or use the SetLimit method to programmatically set query search values. Finally, use the GetFilter method to build the filter expression to apply to your VIEW. Use the ViewManager.SetFilter method or the PROP:Filter property to apply the resulting filter.

QueryListClass--Relationship to Other Application Builder Classes

The QueryListClass is derived from the QueryClass, plus it relies on the QueryListVisual class to display its input dialog and handle the dialog events.

The BrowseClass optionally uses the QueryListClass to filter its result set. If your BrowseClass object uses a QueryListClass object, it must instantiate a QueryListClass object and a QueryListVisual object.

The BrowseClass automatically provides a default query dialog that solicits end user search values for each field displayed in the browse list. See the *Conceptual Example*.

QueryListClass--ABC Template Implementation

The ABC Templates declare a local QueryClass class *and* object for each instance of the BrowseQBEButton template. The ABC Templates automatically include all the code necessary to support the functionality specified in the BrowseQBEButton template.

The templates optionally derive a QueryListClass object for *each* BrowseQBEButton control in the application. The derived class is called QBE# where # is the instance number of the BrowseQBEButton template. The templates provide the derived class so you can use the BrowseQBEButton template **Classes** tab to easily modify the query's behavior on an instance-by-instance basis.

Tip: Use the BrowseQBEButton control template to add a QueryListClass object to your template generated BrowseBoxes.

QueryListClass Source Files

The QueryListClass source code is installed by default to the Clarion \LIBSRC folder. The specific QueryListClass files and their respective components are:

ABQUERY.INC	QueryListClass declarations
ABQUERY.CLW	QueryListClass method definitions

QueryListClass--Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a QueryListClass object and related objects. The example plugs a QueryListClass into a BrowseClass object. The QueryListClass object solicits query criteria (search values) with a "list" dialog, then generates a filter expression based on the end user input.

```
 PROGRAM

_ABCDllMode_ EQUATE(0)
_ABCLinkMode_ EQUATE(1)

 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABQUERY.INC')

   MAP
   END

GlobalErrors  ErrorClass
Access:Customer CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Customer CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END

GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest     LONG(0),THREAD

Customer      FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
CustomerIDKey  KEY(CUS:ID),NOCASE,OPT,PRIMARY
NameKey        KEY(CUS:LastName),NOCASE,OPT
Record         RECORD,PRE()
ID              LONG
LastName        STRING(20)
FirstName       STRING(15)
City            STRING(20)
State           STRING(2)
ZIP             STRING(10)
               END
              END
```

```
CustView     VIEW(Customer)
             END
CustQ        QUEUE
CUS:LastName   LIKE(CUS:LastName)
CUS:FirstName  LIKE(CUS:FirstName)
CUS:ZIP        LIKE(CUS:ZIP)
ViewPosition   STRING(1024)
             END


CusWindow WINDOW('Browse Customers'),AT(,,210,105),IMM,SYSTEM,GRAY
           LIST,AT(5,5,200,80),USE(?CusList),IMM,HVSCROLL,FROM(CustQ),|
           FORMAT('80L(2)|M~Last~@s20@64L(2)|M~First~@s15@44L(2)|M~ZIP~@s10@')
           BUTTON('&Query'),AT(50,88),USE(?Query)
           BUTTON('Close'),AT(90,88),USE(?Close)
          END

ThisWindow CLASS(WindowManager)          !declare ThisWindow object
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END

Query      QueryListmClass             !declare Query object
QBEWindow  QueryListVisual             !declare QBEWindow object
BRW1     CLASS(BrowseClass)            !declare BRW1 object
Q        &CustQ
         END
 CODE
 GlobalErrors.Init
 Relate:Customer.Init
 GlobalResponse = ThisWindow.Run()     !ThisWindow handles all events
 Relate:Customer.Kill
 GlobalErrors.Kill

ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?CusList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(?Close,RequestCancelled)
 Relate:Customer.Open
 BRW1.Init(?CusList,CustQ.ViewPosition,CustView,CustQ,Relate:Customer,ThisWindow)
 OPEN(CusWindow)
 SELF.Opened=True
 Query.Init(QBEWindow)               !initialize Query object
```

```
 BRW1.Q &= CustQ
 BRW1.AddSortOrder(,CUS:NameKey)
 BRW1.AddField(CUS:LastName,BRW1.Q.CUS:LastName)
 BRW1.AddField(CUS:FirstName,BRW1.Q.CUS:FirstName)
 BRW1.AddField(CUS:ZIP,BRW1.Q.CUS:ZIP)
 BRW1.QueryControl = ?Query           !register Query button w/ BRW1
 BRW1.UpdateQuery(Query)              !make each browse item Queryable
 Query.AddItem('Cus:State','State')   !make State field Queryable too
 SELF.SetAlerts()
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:Customer.Close
 RETURN ReturnValue

Access:Customer.Init PROCEDURE
 CODE
 PARENT.Init(Customer,GlobalErrors)
 SELF.FileNameValue = 'Customer'
 SELF.Buffer &= CUS:Record
 SELF.Create = 1
 SELF.AddKey(CUS:CustomerIDKey,'CUS:CustomerIDKey',1)
 SELF.AddKey(CUS:NameKey,'CUS:NameKey',0)

Relate:Customer.Init PROCEDURE
 CODE
 Access:Customer.Init
 PARENT.Init(Access:Customer,1)

Relate:Customer.Kill PROCEDURE
 CODE
 Access:Customer.Kill
 PARENT.Kill
```

QueryListClass Properties

The QueryListClass inherits all the properties of the QueryClass from which it is derived. See *QueryClass Properties* for more information.

QueryListClass Methods

The QueryListClass inherits all the methods of the QueryClass from which it is derived. See *QueryClass Methods* for more information.

QueryListClass--Functional Organization--Expected Use

As an aid to understanding the QueryListClass, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the QueryListClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into two categories:

Housekeeping (one-time) Use:

Init	initialize the QueryListClass object
AddItem[I]	add a field to query
Kill[V]	shut down the QueryListListClass object

Mainstream Use:

Ask[V]	accept query criteria
GetFilter[I]	return filter expression

Occasional Use:

Reset[I]	reset the QueryListClass object
GetLimit[I]	get search values
SetLimit[I]	set search values

[V] These methods are also Virtual.
[I] These methods are inherited from the QueryClass.

Virtual Methods

Typically you will not call these methods directly--other ABC Library methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Ask	accept query criteria
Kill	shut down the QueryListClass object

Ask (solicit query criteria:QueryListClass)

Ask([*uselast*] **), DERIVED, PROC**

Ask	Accepts query criteria (search values) from the end user.
uselast	An integer constant, variable, EQUATE, or expression that determines whether the QueryListClass object carries forward previous query criteria. A value of one (1) carries forward input from the previous query; a value of zero (0) discards previous input.

The **Ask** method displays a query dialog, processes its events, and returns a value indicating whether to apply the query or abandon it. A return value of Level:Notify indicates the QueryListClass object should apply the query criteria; a return value of Level:Benign indicates the end user cancelled the query input dialog and the QueryListClass object should not apply the query criteria.

Implementation: The Ask method declares a generic (empty) dialog to accept query criteria. The Ask method calls the QueryListClass object's WindowManager to define the dialog and process it's events.

The GetFilter method generates filter expressions using the search values set by the Ask method.

The Init method sets the value of the QueryListClass object's WindowManager.

Return Data Type: BYTE

Example:

```
MyBrowseClass.TakeLocate PROCEDURE
CurSort USHORT,AUTO
I USHORT,AUTO
 CODE
 IF ~SELF.Query&=NULL AND SELF.Query.Ask()
  CurSort = POINTER(SELF.Sort)
  LOOP I = 1 TO RECORDS(SELF.Sort)
   PARENT.SetSort(I)
   SELF.SetFilter(SELF.Query.GetFilter(),'9 - QBE')
  END
  PARENT.SetSort(CurSort)
  SELF.ResetSort(1)
 END
```

See Also: GetFilter, Init, QueryListVisual

Init (initialize the QueryListClass object)

Init(*querywindowmanager, inimanager, family, errormanager* **)**

Init	Initializes the QueryListClass object.
querywindowmanager	The label of the QueryListVisual object that displays the query input dialog list and processes it's events.
inimanager	The label of the INIManager object.
family	A string constant, variable, EQUATE, or expression containing the procedure name of the calling procedure.
errormanager	The label of the Global ErrorManager object.

The **Init** method initializes the QueryListClass object.

Implementation: The Init method sets the QFC property for the *querywindowmanager*.

Example:

```
ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other initialization code
  Query.Init(QueryWindow)
  Query.AddItem('UPPER(CLI:LastName)','Name','s20')
  Query.AddItem('CLI:ZIP+1','ZIP+1','')
  RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other termination code
  Query.Kill
  RETURN ReturnValue
```

See Also: Kill, QueryListVisual, QueryListVisual.QFC

Kill (shut down the QueryListClass object)

Kill, DERIVED

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Example:

```
ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other initialization code
  Query.Init(QueryWindow)
  Query.AddItem('UPPER(CLI:LastName)','Name','s20')
  Query.AddItem('CLI:ZIP+1','ZIP+1','')
  RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !other termination code
  Query.Kill
  RETURN ReturnValue
```

See Also: Init

QueryListVisual

QueryListVisual--Overview

The QueryListVisual class is a QueryVisualClass that displays a query input dialog and handles the dialog events. The query dialog includes an edit-in-place, 3-column listbox, which allows the end user to choose the fields to query, the equivalence operator, and the value to query for.

QueryListVisual Concepts

The QueryListVisual provides the query window for a QueryListClass object. The Init method defines and "programs" the query input dialog at runtime. The query interface includes an edit-in-place, 3-column listbox with a field column, an equivalence operator (contains, begins, equal, not equal, greater than, less than) column, and a value (to query for) column.

QueryListVisual--Relationship to Other Application Builder Classes

The QueryListVisual class is derived from the QueryVisualClass.

The BrowseClass optionally uses the QueryListVisual class to provide the user an edit-in-place list interface to it's query facility.

The QueryListClass requires the QueryListVisual class as a window manager.

QueryListVisual--ABC Template Implementation

The ABC Templates declare a local QueryListVisual class *and* object for each instance of the BrowseQBEButton template. The ABC Templates automatically include all the code necessary to support the functionality specified in the BrowseQBEButton template.

The templates optionally *derive* a class from the QueryListVisual for *each* BrowseQBEButton control in the application. The derived class is called QBV# where # is the instance number of the BrowseQBEButton template. The templates provide the derived class so you can use the BrowseQBEButton template **Classes** tab to easily modify the query's behavior on an instance-by-instance basis.

Tip: Use the BrowseQBEButton control template to add a QueryListClass object to your template generated BrowseBoxes.

QueryListVisual Source Files

The QueryListVisual source code is installed by default to the Clarion \LIBSRC folder. The specific QueryListVisual files and their respective components are:

ABQUERY.INC	QueryListVisual declarations
ABQUERY.CLW	QueryListVisual method definitions

QueryListVisual--Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a QueryListVisual object and related objects. The example plugs a QueryListClass into a BrowseClass object. The QueryListClass object uses the QueryListVisual to solicit query criteria (search values) from the end user.

Note that the QueryVisualClass and BrowseClass objects internally handle the normal events surrounding the query.

```
 PROGRAM

_ABCDllMode_ EQUATE(0)
_ABCLinkMode_ EQUATE(1)

 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABQUERY.INC')

 MAP
 END

GlobalErrors  ErrorClass
Access:Customer CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Customer CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END

GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest     LONG(0),THREAD

Customer      FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
CustomerIDKey  KEY(CUS:ID),NOCASE,OPT,PRIMARY
NameKey        KEY(CUS:LastName),NOCASE,OPT
Record         RECORD,PRE()
ID              LONG
LastName        STRING(20)
FirstName       STRING(15)
City            STRING(20)
State           STRING(2)
ZIP             STRING(10)
               END
              END
```

```
CustView     VIEW(Customer)
             END

CustQ        QUEUE
CUS:LastName   LIKE(CUS:LastName)
CUS:FirstName  LIKE(CUS:FirstName)
CUS:ZIP        LIKE(CUS:ZIP)
ViewPosition   STRING(1024)
             END

CusWindow WINDOW('Browse Customers'),AT(,,210,105),IMM,SYSTEM,GRAY
           LIST,AT(5,5,200,80),USE(?CusList),IMM,HVSCROLL,FROM(CustQ),|
           FORMAT('80L(2)|M~Last~@s20@64L(2)|M~First~@s15@44L(2)|M~ZIP~@s10@')
           BUTTON('&Query'),AT(50,88),USE(?Query)
           BUTTON('Close'),AT(90,88),USE(?Close)
          END

ThisWindow CLASS(WindowManager)          !declare ThisWindow object
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END

Query      QueryListClass             !declare Query object
QBEWindow  QueryListVisual            !declare QBEWindow object
BRW1     CLASS(BrowseClass)           !declare BRW1 object
Q        &CustQ
         END
 CODE
 GlobalErrors.Init
 Relate:Customer.Init
 GlobalResponse = ThisWindow.Run()        !ThisWindow handles all events
 Relate:Customer.Kill
 GlobalErrors.Kill


ThisWindow.Init PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?CusList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(?Close,RequestCancelled)
 Relate:Customer.Open
 BRW1.Init(?CusList,CustQ.ViewPosition,CustView,CustQ,Relate:Customer,ThisWindow)
 OPEN(CusWindow)
```

```
 SELF.Opened=True
 Query.Init(QBEWindow)                !initialize Query object
 BRW1.Q &= CustQ
 BRW1.AddSortOrder(,CUS:NameKey)
 BRW1.AddField(CUS:LastName,BRW1.Q.CUS:LastName)
 BRW1.AddField(CUS:FirstName,BRW1.Q.CUS:FirstName)
 BRW1.AddField(CUS:ZIP,BRW1.Q.CUS:ZIP)
 BRW1.QueryControl = ?Query           !register Query button w/ BRW1
 BRW1.UpdateQuery(Query)              !make each browse item Queryable
 Query.AddItem('Cus:State','State')   !make State field Queryable too
 SELF.SetAlerts()
 RETURN ReturnValue


ThisWindow.Kill PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:Customer.Close
 RETURN ReturnValue

Access:Customer.Init PROCEDURE
 CODE
 PARENT.Init(Customer,GlobalErrors)
 SELF.FileNameValue = 'Customer'
 SELF.Buffer &= CUS:Record
 SELF.Create = 1
 SELF.AddKey(CUS:CustomerIDKey,'CUS:CustomerIDKey',1)
 SELF.AddKey(CUS:NameKey,'CUS:NameKey',0)

Relate:Customer.Init PROCEDURE
 CODE
 Access:Customer.Init
 PARENT.Init(Access:Customer,1)

Relate:Customer.Kill PROCEDURE
 CODE
 Access:Customer.Kill
 PARENT.Kill
```

QueryListVisual Properties

The QueryListVisual inherits all the properties of the QueryVisualClass from which it is derived. See QueryVisualClass properties for more information.

In addition to the inherited properties, the QueryListVisual contains the following properties:

QFC (reference to the QueryListClass)

QFC &QueryListClass

The **QFC** property is a reference to the QueryListClass that uses this QueryListVisual object to solicit query criteria (search values) from the end user.

Implementation: The QueryListClass.Init method sets the QFC property.

See Also: QueryListClass.Init

OpsEIP (reference to the EditDropListClass)

OpsEIP &EditDropListClass,PROTECTED

The **OpsEIP** property is a reference to the EditDropListClass that displays the available operators in the QueryList dialog.

FldsEIP (reference to the EditDropListClass)

FldsEIP &EditDropListClass,PROTECTED

The **FldsEIP** property is a reference to the EditDropListClass that displays the available fields to query in the QueryList dialog.

ValueEIP(reference to QEditEntryClass)

ValueEIP &EditEntryClass,PROTECTED

The **ValueEIP** property is a reference to the QEditEntryClass that enables edit-in-place entry fields in the QBE window.

Implementation: The ValueEIP is initialized in the QueryListVisual.Init method and updated in the QueryListVisual.UpdateControl method.

See Also: QueryListVisual.Init, QueryListVisual.UpdateControl, QueryListVisual.Kill

QueryListVisual Methods

The QueryListVisual inherits all the methods of the QueryVisualClass from which it is derived. See QueryVisualClass methods for more information.

QueryListVisual--Functional Organization--Expected Use

As an aid to understanding the QueryListVisual class, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the QueryListVisual methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init[D]	program the QueryListVisual object

MainStream Use:

none

Occasional Use:

none

[D] These methods are Derived.

Derived Methods

Typically you will not call these methods directly--other ABC Library methods call them. However, we anticipate you will often want to override these methods, and because they are derived, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init	program the QueryListVisual object
SetAlerts	prepare the query dialog for EIP
TakeEvent	Handle events for the query dialog
TakeCompleted	wrap up the query dialog
TakeAccepted	handle EVENT:Accepted events

Init (initialize the QueryListVisual object)

Init, DERIVED PROC

The **Init** method initializes the QueryListVisual object. Init returns Level:Benign to indicate normal initialization.

The Init method "programs" the QueryListVisual object.

Implementation: The QueryListClass.Ask method (indirectly) calls the Init method to configure the QueryListClass WINDOW.

The Init method reads each queryable item (defined by the QFC property) from a queue, then creates an edit-in-place, 3-column listbox with a field column, an equivalence operator (equal, not equal, greater than, etc.) column, and a value (to query for) column.

The Init method sets the coordinates for the QueryListClass WINDOW and for the individual controls.

Return Data Type: BYTE

Example:

```
QueryListClass.Ask       PROCEDURE(BYTE UseLast)
W WINDOW('Query'),AT(,,300,200),FONT('MS SansSerif',8,,FONT:regular),SYSTEM,GRAY,DOUBLE
  LIST,AT(5,5,290,174),USE(?List,FEQ:ListBox),|
  FORMAT('91L|M~Field~@s20@44C|M~Operator~L@s10@120C|M~Value~L@s30@')
  BUTTON('Insert'),AT(5,183,45,14),USE(?Insert,FEQ:Insert)
  BUTTON('Change'),AT(52,183,45,14),USE(?Change,FEQ:Change)
  BUTTON('Delete'),AT(99,183,45,14),USE(?Delete,FEQ:Delete)
  BUTTON('&OK'),AT(203,183,45,14),USE(?Ok,FEQ:OK),DEFAULT
  BUTTON('Cancel'),AT(250,183,45,14),USE(?Cancel,FEQ:Cancel)
 END
 CODE
 OPEN(W)
 IF ~UseLast THEN SELF.Reset().
 RETURN CHOOSE(SELF.Win.Run()=RequestCancelled,Level:Benign,Level:Notify)
```

See Also: QFC

Kill (shutdown the QueryListVisual object)

Kill, PROC, DERIVED

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Return Data Type: BYTE

ResetFromQuery (reset the QueryList Visual object)

ResetFromQuery, DERIVED

The **ResetFromQuery** method resets the QueryListVisual object after a query.

Implementation: The ResetFromQuery method calls the GetLimit method for each field available for query.

Example:

```
QueryListVisual.ResetFromQuery PROCEDURE
I USHORT
CaseLess  BYTE,AUTO
High    BYTE
 CODE
 FREE(SELF.Vals)
 LOOP I = 1 TO RECORDS(SELF.QFC.Fields)
  GET(SELF.QFC.Fields,I)
   LOOP
    High = SELF.QFC.GetLimit(SELF.Vals.Value,SELF.Vals.Ops,CaseLess,High)
    IF SELF.Vals.Value
     IF CaseLess AND SELF.Vals.Value[1] ~= '^'
      SELF.Vals.Value = '^' & SELF.Vals.Value
     END
     SELF.Vals.Field = SELF.QFC.Fields.Title
     ADD(SELF.Vals)
    END
   WHILE High
 END
 RETURN
```

See Also: QueryClass.GetLimit

SetAlerts (alert keystrokes for the edit control:QueryListVisual)

SetAlerts, DERIVED

The **SetAlerts** method method alerts appropriate keystrokes for the edit-in-place control.

Implementation: The Init method calls the CreateControl method to create the input control and set the FEQ property. The Init method then calls the SetAlerts method to alert specific keystrokes for the query dialog. Alerted keys are:

```
MouseLeft2                  !edit selected record
InsertKey                   !add a query field
CtrlEnter                   !edit selected record
DeleteKey                   !delete query field
```

Example:

```
EditClass.Init PROCEDURE(UNSIGNED FieldNo,UNSIGNED ListBox,*? UseVar)
 CODE
 SELF.ListBoxFeq = ListBox
 SELF.CreateControl()
 ASSERT(SELF.Feq)
 SELF.UseVar &= UseVar
 SELF.Feq{PROP:Text} = ListBox{PROPLIST:Picture,FieldNo}
 SELF.Feq{PROP:Use} = UseVar
 SELF.SetAlerts
```

See Also: Init

TakeAccepted (handle query dialog EVENT:Accepted events)

TakeAccepted, DERIVED, PROC

The **TakeAccepted** method processes EVENT:Accepted events for the query dialog's controls, and returns a value indicating whether ACCEPT loop processing is complete and should stop. TakeAccepted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeAccepted method handles the processing of the update butons (Insert, Change, Delete) on the Query list dialog.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: QFC

TakeCompleted (complete the query dialog)

TakeCompleted, DERIVED, PROC

The **TakeCompleted** method processes the EVENT:Completed event for the query dialog and returns a value indicating whether window ACCEPT loop processing is complete and should stop.

TakeCompleted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Based on the current state of the querydialog, the TakeCompleted method sets the search values in the QFC property. The QFC property may use these search values to create a filter expresssion.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: QFC

TakeEvent (process edit-in-place events:QueryListVisual)

TakeEvent(*event* **), VIRTUAL**

TakeEvent Processes an event for the QueryListVisualClass object.

event An integer constant, variable, EQUATE, or expression that contains the event number (see EVENT in the *Language Reference*).

The **TakeEvent** method processes an event for the QueryListVisualClass object and returns a value indicating the user requested action. Valid actions are none, insert (InsertKey), change (MouseLeft2 or CtrlEnter), or delete (DeleteKey).

Implementation: The EIPManager.TakeFieldEvent method calls the TakeEvent method. The TakeEvent method process an EVENT:AlertKey for the edit-in-place control and returns a value indicating the user requested action.

Return Data Type: BYTE

Example:

```
EIPManager.TakeFieldEvent        PROCEDURE
I UNSIGNED(1)
  CODE
  IF FIELD() = SELF.ListControl THEN RETURN Level:Benign .
  LOOP I = 1 TO RECORDS(SELF.EQ)+1
   ! Optimised to pick up subsequent events from same field
    IF ~SELF.EQ.Control &= NULL AND SELF.EQ.Control.Feq = FIELD()
      SELF.TakeAction(SELF.EQ.Control.TakeEvent(EVENT()))
      RETURN Level:Benign
    END
    GET(SELF.EQ,I)
  END
  ! Not a known field
  IF ?{PROP:Type} <> CREATE:Button OR EVENT() <> EVENT:Selected
    !Wait to post accepted for button
    SELF.Repost = EVENT()
    SELF.RepostField = FIELD()
    SELF.TakeFocusLoss
  END
  RETURN Level:Benign
```

See Also: EIPManager.TakeFieldEvent, SetAlerts

TakeFieldEvent (a virtual to process field events:QueryListVisual)

TakeFieldEvent, DERIVED, PROC

The **TakeFieldEvent** method is a virtual placeholder to process all field-specific/control-specific events for the window. It returns a value indicating whether window process is complete and should stop. TakeFieldEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Return values are declared in ABERROR.INC. The TakeEvent method calls the TakeFieldEvent method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I USHORT,AUTO
  CODE
  IF ~FIELD()
    RVal = SELF.TakeWindowEvent()
    IF RVal THEN RETURN RVal.
  END
  CASE EVENT()
    OF EVENT:Accepted; RVal = SELF.TakeAccepted()
    OF EVENT:Rejected; RVal = SELF.TakeRejected()
    OF EVENT:Selected; RVal = SELF.TakeSelected()
    OF EVENT:NewSelection;RVal = SELF.TakeNewSelection()
    OF EVENT:Completed; RVal = SELF.TakeCompleted()
    OF EVENT:CloseWindow OROF EVENT:CloseDown
    RVal = SELF.TakeCloseEvent()
  END
  IF RVal THEN RETURN RVal.
  IF FIELD()
    RVal = SELF.TakeFieldEvent()
  END
  RETURN Rval
```

See Also: WindowManager.Ask

UpdateControl(updates the edit-in-place entry control)

UpdateControl(*fieldname***)**

UpdateControl Updates the value for the edit-in-place entry control.

fieldname A string constant, variable, EQUATE, or expression containing the name of the edit-in-place field.

The **UpdateControl** method updates the value for the edit-in-place entry control.

Implementation: The UpdateControl method is called from the QEIPManager.TakeEvent, when the MouseRight button is clicked.

UpdateFields (process query values)

UpdateFields, DERIVED

The **UpdateFields** method processes the values entereed into the query dialog for assignment to a filter statment.

Implementation: The TakeCompleted method calls the UpdateFields method.

Example:

```
QueryListVisual.TakeCompleted   PROCEDURE
  CODE
  SELF.SetResponse(RequestCompleted)
  SELF.UpdateFields
  RETURN Level:Benign
```

See Also: TakeCompleted

QueryVisualClass

QueryVisualClass: Overview

The QueryVisualClass is a WindowManager that displays a query input dialog and handles the dialog events. The QueryVisualClass is an abstract class that handles all of the basic Window functionality for the query dialog.

QueryVisualClass Concepts

The QueryVisualClass is the parent class for the Query dialogs. It is designed to encapsulate the standard query requirements for the window manager.

QueryVisualClass:Relationship to Other Application Builder Classes

The QueryVisualClass is derived from the WindowManager. The classes derived from the QueryVisualClass are optionally used by the QueryClass object.

The QueryFormVisual and the QueryListVisual classes are derived QueryVisualClasses.

QueryVisualClass:ABC Template Implementation

The ABC Templates do not instantiate the QueryClass object independently. The templates instantiate the derived QueryFormClass or QueryListClass instead.

QueryVisualClass Source Files

The QueryVisualClass source code is installed by default to the Clarion \LIBSRC folder. The specific QueryVisualClass files and their respective components are:

ABQUERY.INC	QueryVisual declarations
ABQUERY.CLW	QueryVisual method definitions

QueryVisualClass Properties

The QueryVisualClass inherits all the properties of the WindowManager from which it is derived. See WindowManager Properties for more information.

In addition to the inherited properties, the QueryVisualClass contains the following properties:

QC (reference to the QueryClass)

QC **&QueryClass**

The **QC** property is a reference to the QueryClass that uses this QueryVisualClass object to solicit query criteria (search values) from the end user.

Implementation: The QueryFormVisual.Init and QueryListVisual.Init methods set the QC property.

See Also: QueryFormVisual.Init, QueryListVisual.Init

Resizer (reference to the WindowResizeClass:QueryVisualClass)

Resizer **&WindowResizeClass**

The **Resizer** property is a reference to the WindowResizeClass that is used by this QueryVisualClass object to handle resizing of the Window controls at runtime.

Implementation: The Init method sets the Resizer property.

See Also: Init, Kill

QueryVisualClass Methods

The QueryVisualClass inherits all the methods of the WindowManager from which it is derived. See WindowManager Methods for more information.

Init (initialize the QueryVisual object)

Init, DERIVED, PROC

The **Init** method initializes the QueryVisual object. Init returns Level:Benign to indicate normal initialization. The Init method "programs" the QueryVisual object.

Implementation: The Init method is called from the Init methods of both the QueryFormVisual and the QueryListVisual as PARENT calls. Typically, the Init method is paired with the Kill method, performing the converse of the Kill method tasks.

Return Data Type: BYTE

Example:

```
QueryFormVisual.Init           PROCEDURE
  CODE
  QFC &= SELF.QFC
  CLEAR(SELF)
  SELF.QFC &= QFC
  SELF.QC &= QFC
  RVal = PARENT.Init()      ! The call to the Init
  IF RVal THEN RETURN RVal.
  ! Saved query code
  RETURN RVal
```

See Also: Kill

Kill (shut down the QueryVisual object)

Kill, DERIVED, PROC

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code. Kill returns a value to indicate the status of the shut down.

Implementation: Kill sets the Dead property to True and returns Level:Benign to indicate a normal shut down. If the Dead property is already set to True, Kill returns Level:Notify to indicate it is taking no additional action.

Typically, the Kill method is paired with the Init method, performing the converse of the Init method tasks.

Return value EQUATEs are declared in ABERROR.INC.

Return Data Type: BYTE

Example:

```
ThisWindow.Kill PROCEDURE()
CODE
IF PARENT.Kill() THEN RETURN Level:Notify.
IF FilesOpened
  Relate:Defaults.Close
END
IF SELF.Opened
  INIMgr.Update('Main',AppFrame)
END
GlobalResponse = CHOOSE(LocalResponse=0,RequestCancelled,LocalResponse)
```

See Also: Init

Reset (reset the dialog for display:QueryVisualClass)

Reset (*forcerest*), DERIVED

Reset	Resets the QueryVisual object.
forcereset	A numeric constant, variable, EQUATE, or expression that indicates whether to conditionally or uncondition-ally reset the window. A value of one (1 or True) uncon-ditionally resets the window; a value of zero (0 or False) only resets the window if circumstances require, such as a new sort on browse object or a changed reset field on a browse object. If omitted, *forcereset* defaults to zero (0).
Implementation:	The Reset method calls the WindowMangaer.Reset and handles the logic for enabling and disabling the Load and Save buttons. The Reset is called by the TakeFieldEvent and TakeAccepted methods.

Example:

```
QueryVisual.TakeFieldEvent PROCEDURE
  CODE
  CASE FIELD()
  OF FEQ:QueryNameField
     CASE EVENT()
     OF EVENT:NewSelection
        SELF.Reset
     END
  OF FEQ:SaveListBox
     CASE Event()
     OF EVENT:AlertKey
        IF Keycode() = MouseLeft2
           GET(SELF.Queries,CHOICE(FEQ:SaveListBox))
           SELF.QC.Restore(SELF.Queries.Item)
           SELF.ResetFromQuery
           POST(EVENT:Accepted,FEQ:Ok)
        END
     OF EVENT:NewSelection
        GET(SELF.Queries,CHOICE(FEQ:SaveListBox))
        FEQ:QueryNameField{Prop:ScreenText} = SELF.Queries.Item
        Update(FEQ:QueryNameField)
        SELF.Reset
     END
  END
  RETURN PARENT.TakeFieldEvent()
```

See Also: TakeFieldEvent, TakeAccepted

TakeAccepted (handle query dialog EVENT:Accepted events)

TakeAcepted, DERIVED, PROC

The **TakeAccepted** method processes EVENT:Accepted events for the query dialog's controls, and returns a value indicating whether ACCEPT loop processing is complete and should stop. TakeAccepted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: For each queryable item (defined by the QC property), the TakeAccepted method implements cycling of operators for the query operator buttons. On each button press, the button cycles through the available filter operators: equal(=), greater than or equal(>=), less than or equal(<=), not equal(<>), and no filter( ).

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I USHORT,AUTO
  CODE
  IF ~FIELD()
    RVal = SELF.TakeWindowEvent()
    IF RVal THEN RETURN RVal.
  END
  CASE EVENT()
    OF EVENT:Accepted; RVal = SELF.TakeAccepted()
    OF EVENT:Rejected; RVal = SELF.TakeRejected()
    OF EVENT:Selected; RVal = SELF.TakeSelected()
    OF EVENT:NewSelection;RVal = SELF.TakeNewSelection()
    OF EVENT:Completed; RVal = SELF.TakeCompleted()
    OF EVENT:CloseWindow OROF EVENT:CloseDown
    RVal = SELF.TakeCloseEvent()
  END
  IF RVal THEN RETURN RVal.
  IF FIELD()
    RVal = SELF.TakeFieldEvent()
  END
  RETURN Rval
```

See Also: QC

TakeFieldEvent (a virtual to process field events:QueryVisualClass)

TakeFieldEvent, DERIVED, PROC

The **TakeFieldEvent** method is a virtual placeholder to process all field-specific/control-specific events for the window. It returns a value indicating whether window process is complete and should stop. TakeFieldEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Return values are declared in ABERROR.INC. The TakeEvent method calls the TakeFieldEvent method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I USHORT,AUTO
  CODE
  IF ~FIELD()
    RVal = SELF.TakeWindowEvent()
    IF RVal THEN RETURN RVal.
  END
  CASE EVENT()
    OF EVENT:Accepted; RVal = SELF.TakeAccepted()
    OF EVENT:Rejected; RVal = SELF.TakeRejected()
    OF EVENT:Selected; RVal = SELF.TakeSelected()
    OF EVENT:NewSelection;RVal = SELF.TakeNewSelection()
    OF EVENT:Completed; RVal = SELF.TakeCompleted()
    OF EVENT:CloseWindow OROF EVENT:CloseDown
    RVal = SELF.TakeCloseEvent()
  END
  IF RVal THEN RETURN RVal.
  IF FIELD()
    RVal = SELF.TakeFieldEvent()
  END
  RETURN Rval
```

See Also: WindowManager.Ask

TakeWindowEvent (a virtual to process non-field events:QueryVisualClass)

TakeWindowEvent, DERIVED, PROC

The **TakeWindowEvent** method processes all non-field events for the window and returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeWindowEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: TakeWindowEvent implements standard handling of EVENT:OpenWindow Open method), EVENT:LoseFocus, EVENT:GainFocus (Reset method), and EVENT:Sized (WindowResizeClass.Resize method). Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeWindowEvent method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I USHORT,AUTO
 CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
  OF EVENT:Accepted; RVal = SELF.TakeAccepted()
  OF EVENT:Rejected; RVal = SELF.TakeRejected()
  OF EVENT:Selected; RVal = SELF.TakeSelected()
  OF EVENT:NewSelection;RVal = SELF.TakeNewSelection()
  OF EVENT:Completed; RVal = SELF.TakeCompleted()
  OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN Rval
```

See Also: WindowManager.TakeEvent

RelationManager

RelationManager Overview

The RelationManager class declares a relation manager object that does the following:

- Consistently and flexibly defines relationships between files--the relationships need not be defined in a data dictionary; they may be defined directly (dynamically) to the relation manager object.
- Reliably enforces discrete specified levels of referential integrity (RI) constraints between the related files--the RI constraints need not be defined in a data dictionary; they may be defined directly (dynamically) to the relation manager object.
- Conveniently forwards appropriate file commands to related files--for example, when a relation manager object opens its primary file, it also opens any related files.

The RelationManager class provides "setup" methods that let you describe the file relationships, their linking fields, and their associated RI constraints; plus other methods to perform the cascadable or constrainable database operations such as open, change, delete, and close.

Relation Manager Concepts and Conventions

Cascading Commands and Referential Constraints

You can fully describe a set of file relationships with a series of RelationManager objects--one RelationManager object for each file. Each RelationManager object defines the relationships between its primary file and any files *directly* related to the primary file. However, each RelationManager object also knows about its related files' RelationManager objects, so indirectly, it knows about those secondary relationships too.

For example, consider three related files: Customer <->> Order <->> Item, where <->> indicates a one:many relationship. The RelationManager object for the Customer file knows about the relationship between Customer and Order, but it also knows about the Order file's RelationManager object, so indirectly, it knows about the relationship between Order and Item too.

The benefit of this chain of RelationManager awareness, is that you can issue a file command such as open or close to any one of the RelationManager objects and it forwards the command up *and* down the chain of related files; and for deletes or changes, it enforces any relational integrity constraints up and down the chain of related files.

Me and Him

Some of the RelationManager methods refer to its primary file as "MyFile" or "Me" and its related files as "HisFile" or "Him." See Relation Manager Properties for more information.

Left and Right (and Buffer)

Some of the RelationManager methods refer to its primary file record buffer as "Left," the associated queue buffer as "Right" and the associated save area for the record as "Buffer." See BufferedPairsClass and FieldPairsClass for more information.

RelationManager ABC Template Implementation

The ABC Templates *derive* a class from the RelationManager class for *each* file the application processes. The derived classes are called Hide:Relate:*filename*, but may be referenced as Relate:*filename*. These derived classes and their methods are declared and implemented in the generated *appna*BC0.CLW through *appna*BC9.CLW files (depending on how many files your application uses). The derived class methods are specific to the file being managed, and they enforce the file relationships and referential integrity constraints specified in the data dictionary.

The ABC Templates generate housekeeping procedures to initialize and shut down the RelationManager objects. The procedures are DctInit and DctKill. They are generated into the *appna*BC.CLW file.

The derived RelationManager classes are configurable with the **Global Properties** dialog. See *Template Overview--File Control Options* and Classes Options for more information.

RelationManager Relationship to Other Application Builder Classes

FileManager and BufferedPairsClass

The RelationManager relies on both the FileManager and the BufferedPairsClass to do much of its work. Therefore, if your program instantiates the RelationManager it must also instantiate the FileManager and the BufferedPairsClass. Much of this is automatic when you INCLUDE the RelationManager header (ABFILE.INC) in your program's data section. See the Conceptual Example and see File Manager Class and Field Pairs Classes for more information.

ViewManager

Perhaps more significantly, the RelationManager serves as the foundation or "errand boy" of the ViewManager. If your program instantiates the ViewManager it must also instantiate the RelationManager. See View Manager Class for more information.

RelationManager Source Files

The RelationManager source code is installed by default to the Clarion \LIBSRC folder. The RelationManager source code and its respective components are contained in:

ABFILE.INC	RelationManager declarations
ABFILE.CLW	RelationManager method definitions

RelationManager Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate some RelationManager objects.

This example uses the RelationManager class to cascade new key values from parent file records to the corresponding child file records.

```
 PROGRAM
 INCLUDE('ABFILE.INC')
 INCLUDE('ABREPORT.INC')
 MAP
 END

CUSTOMER  FILE,DRIVER('TOPSPEED'),NAME('CUSTOMER'),PRE(CUS),BINDABLE,CREATE,THREAD
BYNUMBER   KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
CUSTNO      LONG
NAME        STRING(30)
ZIP         DECIMAL(5)
           END
          END

PHONES     FILE,DRIVER('TOPSPEED'),NAME('PHONES'),PRE(PHO),BINDABLE,CREATE,THREAD
BYCUSTOMER  KEY(PHO:CUSTNO,PHO:PHONE),DUP,NOCASE,OPT
Record      RECORD,PRE()
CUSTNO       LONG
PHONE        STRING(20)
TYPE         STRING(8)
            END
           END

GlobalErrors   ErrorClass

Access:CUSTOMER CLASS(FileManager)
Init            PROCEDURE
                END
Relate:CUSTOMER CLASS(RelationManager)
Init            PROCEDURE
                END

Access:PHONES   CLASS(FileManager)
Init            PROCEDURE
                END
Relate:PHONES   CLASS(RelationManager)
Init            PROCEDURE
                END
```

```
RecordsPerCycle  LONG(25)
StartOfCycle     LONG,AUTO
PercentProgress  BYTE
ProgressMgr      StepLongClass
CustView       VIEW(CUSTOMER)
               END
Process        ProcessClass
Progress:Bar    BYTE

ProgressWindow WINDOW('Processing...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
                PROGRESS,USE(Progress:Bar),AT(15,15,111,12),RANGE(0,100)
                STRING(''),AT(0,3,141,10),USE(?Progress:UserString),CENTER
                STRING(''),AT(0,30,141,10),USE(?Progress:Text),CENTER
                BUTTON('Cancel'),AT(45,42,50,15),USE(?Progress:Cancel)
               END
 CODE
 GlobalErrors.Init
 Relate:CUSTOMER.Init
 Relate:PHONES.Init
 ProgressMgr.Init(ScrollSort:AllowNumeric)
 Process.Init(CustView,Relate:CUSTOMER,|
           ?Progress:Text,Progress:Bar,|
       ProgressMgr,CUS:CUSTNO)
 Process.AddSortOrder( CUS:BYNUMBER )
 Relate:CUSTOMER.Open
 OPEN(ProgressWindow)
 ?Progress:Text{Prop:Text} = '0% Completed'
 ACCEPT
  CASE EVENT()
  OF Event:OpenWindow
   Process.Reset
   IF Process.Next()
    POST(Event:CloseWindow)
    CYCLE
   END
  OF Event:Timer
   StartOfCycle=Process.RecordsProcessed
   LOOP WHILE Process.RecordsProcessed-StartOfCycle<RecordsPerCycle
    CUS:CUSTNO+=100                     !change parent key value
    IF Relate:CUSTOMER.Update()         !cascade change to children
     BREAK
    END
    CASE Process.Next()
    OF Level:Notify
     ?Progress:Text{Prop:Text} = 'Process Completed'
     DISPLAY(?Progress:Text)
     POST(EVENT:CloseWindow)
     BREAK
```

```
    OF Level:Fatal
     POST(EVENT:CloseWindow)
     BREAK
    END
   END
  END
  CASE FIELD()
  OF ?Progress:Cancel
   CASE Event()
   OF Event:Accepted
    POST(Event:CloseWindow)
   END
  END
 END
 ProgressMgr.Kill
 Relate:CUSTOMER.Close
 Relate:CUSTOMER.Kill
 Relate:PHONES.Kill
 GlobalErrors.Kill

Access:CUSTOMER.Init  PROCEDURE
 CODE
 PARENT.Init(Customer, GlobalErrors)
 SELF.FileNameValue = 'CUSTOMER'
 SELF.Buffer &= CUS:Record
 SELF.AddKey(CUS:BYNUMBER,'CUS:BYNUMBER',1)

Relate:CUSTOMER.Init PROCEDURE
 CODE
 Access:CUSTOMER.Init
 PARENT.Init(Access:CUSTOMER,1)
 SELF.AddRelation(Relate:PHONES,RI:Cascade,RI:Restrict,PHO:BYCUSTOMER)
 SELF.AddRelationLink(CUS:CUSTNO,PHO:CUSTNO)

Access:PHONES.Init  PROCEDURE
 CODE
 PARENT.Init(Phones, GlobalErrors)
 SELF.FileNameValue = 'PHONES'
 SELF.Buffer &= PHO:Record
 SELF.AddKey(PHO:BYCUSTOMER,'PHO:BYCUSTOMER')

Relate:PHONES.Init PROCEDURE
 CODE
 Access:PHONES.Init
 PARENT.Init(Access:PHONES,1)
 SELF.AddRelation( Relate:CUSTOMER )
```

RelationManager Properties

RelationManager Properties

The Relation Manager contains the following properties.

Me (the primary file's FileManager object)

Me &FileManager

The **Me** property is a reference to the FileManager object for the RelationManager's primary file. By definition, the file referenced by this FileManager object is the RelationManager's primary file. The Me property identifies the primary file's FileManager object for the various RelationManager methods.

Implementation: The Init method sets the value of the Me property.

See Also: Init

UseLogout (transaction framing flag)

UseLogout BYTE

The **UseLogout** property determines whether cascaded updates or deletes are done within a transaction frame (LOGOUT/COMMIT). A value of zero (0) indicates no transaction framing; a value of one (1) indicates transaction framing.

Implementation: The Init method sets the value of the UseLogout property.

The ABC Templates set the UseLogout property based on the **Enclose RI code in transaction frame** check box in the **Global Properties** dialog.

See Also: Init

RelationManager Methods

RelationManager Functional Organization--Expected Use

As an aid to understanding the RelationManager, it is useful to organize its methods into two categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the RelationManager methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the RelationManager object
AddRelation	set a file relationship
AddRelationLink	set linking fields for a relationship
SetAlias	add/set a file alias
Kill	shut down the RelationManager object

Mainstream Use:

Openv	open a file and any related files
Savev	copy current and designated related records
Updatev	update current record subject to RI constraints
Deletev	delete current record subject to RI constraints
Closev	close a file and any related files

v These methods are also Virtual.

Occasional Use:

ListLinkingFields	map pairs of linked fields
SetQuickScan	enable QuickScan across related files

Virtual Methods

We anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Open	open a file and any related files
CancelAutoInc	undo PrimeAutoInc actions
Save	copy current and designated related records
Update	update current record subject to RI constraints
Delete	delete current record subject to RI constraints
Close	close a file and any related files

AddRelation (set a file relationship)

AddRelation(*relationmanager* [,*updatemode* ,*deletemode* ,*relatedkey*] **), PROTECTED**

AddRelation Describes a relationship between this object's primary file (see *Me*) and another file.

relationmanager The label of the related file's RelationManager object.

updatemode A numeric constant, variable, EQUATE, or expression that indicates the referential integrity constraint to apply upon updates to the primary file's linking field. Valid constraints are none, clear, restrict, and cascade. If omitted, then *deletemode* and *relatedkey* must also be omitted, and the relationship is unconstrained.

deletemode A numeric constant, variable, EQUATE, or expression that indicates the referential integrity constraint to apply upon deletes of the primary file's linking field. Valid constraints are none, clear, restrict, and cascade. If omitted, then *updatemode* and *relatedkey* must also be omitted, and the relationship is unconstrained.

relatedkey The label of the related file's linking KEY. If included, the call to AddRelation must be followed by a call to AddRelationLink for each linking component field of the key. If omitted, then *updatemode* and *deletemode* must also be omitted, and the relationship is unconstrained.

The **AddRelation** method, in conjunction with the AddRelationLink method, describes a relationship between this object's primary file (see *Me*) and another file so that other RelationManager methods can cascade or constrain file operations across the related files when appropriate.

Implementation: You should typically call AddRelation after the Init method is called (or within your derived Init method).

The EQUATEs for *updatemode* and *deletemode* are declared in FILE.INC as follows:

```
    ITEMIZE(0),PRE(RI)
None     EQUATE     !no action on related files
Clear    EQUATE     !clear the linking fields in related files
Restrict EQUATE     !disallow the operation if linked records exist
Cascade  EQUATE     !update the linking fields in related files, or
    END             !delete the linked records in related files
```

Example:

```
Orders     FILE,DRIVER('TOPSPEED'),PRE(ORD),CREATE
ByCustomer  KEY(ORD:CustNo,ORD:OrderNo),DUP,NOCASE,OPT
```

```
Record      RECORD,PRE()
CustNo       LONG
OrderNo      LONG
OrderDate    LONG
Reference    STRING(24)
ShipTo       STRING(32)
Shipped      BYTE
Carrier      STRING(1)
            END
           END

Items   FILE,DRIVER('TOPSPEED'),PRE(ITEM),CREATE
AsEntered  KEY(ITEM:CustNo,ITEM:OrderNo,ITEM:LineNo),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
CustNo      LONG
OrderNo     LONG
LineNo      SHORT
ProdCode    SHORT
Quantity    SHORT
           END
        END
 CODE
 !program code

Relate:Orders.Init PROCEDURE
 CODE
  SELF.AddRelation( Relate:Items,0,0, ITEM:AsEntered )
  SELF.AddRelationLink( ORD:CustNo, ITEM:CustNo )
  SELF.AddRelationLink( ORD:OrderNo, ITEM:OrderNo )
  SELF.AddRelation( Relate:Customer )
```

See Also: AddRelationLink, Init

AddRelationLink (set linking fields for a relationship)

AddRelationLink(*parentkey, childkey* **), PROTECTED**

AddRelationLink

Identifies the linking fields for a relationship between this object's primary file (see *Me*) and another file.

parentkey The label of the primary file's linking field.

childkey The label of the related file's linking field.

The **AddRelationLink** method, in conjunction with the AddRelation method, describes a relationship between this object's primary file (see *Me*) and another file so that other RelationManager methods can cascade or constrain file operations across the related files when appropriate.

You must call AddRelationLink for each pair of linking fields, and the calls must be in sequence of high order linking fields to low order linking fields.

Implementation: You should typically call AddRelationLink after the Init method is called (or within your derived Init method).

Example:

```
Orders     FILE,DRIVER('TOPSPEED'),PRE(ORD),CREATE
ByCustomer  KEY(ORD:CustNo,ORD:OrderNo),DUP,NOCASE,OPT
Record      RECORD,PRE()
CustNo       LONG
OrderNo      LONG
OrderDate    LONG
Reference    STRING(24)
ShipTo       STRING(32)
Shipped      BYTE
Carrier      STRING(1)
            END
           END

Items     FILE,DRIVER('TOPSPEED'),PRE(ITEM),CREATE
AsEntered  KEY(ITEM:CustNo,ITEM:OrderNo,ITEM:LineNo),NOCASE,OPT,PRIMARY
Record     RECORD,PRE()
CustNo      LONG
OrderNo     LONG
LineNo      SHORT
ProdCode    SHORT
Quantity    SHORT
           END
         END
```

```
 CODE
 !program code
Relate:Orders.Init PROCEDURE
 CODE
  SELF.AddRelation( Relate:Items,0,0, ITEM:AsEntered )
  SELF.AddRelationLink( ORD:CustNo, ITEM:CustNo )
  SELF.AddRelationLink( ORD:OrderNo, ITEM:OrderNo )
  SELF.AddRelation( Relate:Customer )
```

See Also: AddRelation, Init

CancelAutoInc (undo autoincrement)

CancelAutoInc, VIRTUAL, PROC

The **CancelAutoInc** method restores the managed file to its pre-PrimeAutoInc state, typically when an insert operation is cancelled. CancelAutoInc returns a value indicating its success or failure. A return value of zero (0 or Level:Benign) indicates success; any other return value indicates a problem.

Implementation: The CancelAutoInc method calls the FileManager.CancelAutoInc method for its primary file, passing SELF as the *relation manager* parameter.

Return value EQUATEs are declared in ABERROR.INC as follows:

```
! Severity of error
Level:Benign   EQUATE(0)
Level:User     EQUATE(1)
Level:Program  EQUATE(2)
Level:Fatal    EQUATE(3)
Level:Cancel   EQUATE(4)
Level:Notify   EQUATE(5)
```

Return Data Type: BYTE

Example:

```
WindowManager.TakeCloseEvent PROCEDURE
 CODE
  IF SELF.Response <> RequestCompleted
  !procedure code
   IF SELF.OriginalRequest=InsertRecord AND SELF.Response=RequestCancelled
    IF SELF.Primary.CancelAutoInc()  !undo PrimeAutoInc - cascade
     SELECT(SELF.FirstField)
     RETURN Level:Notify
    END
  END
  !procedure code
 END
 RETURN Level:Benign
```

See Also: FileManager.CancelAutoInc, FileManager.PrimeAutoInc

Close (close a file and any related files)

Close(*cascading* **), VIRTUAL, PROC**

Close	Closes this object's primary file (see *Me*) and any related files.
cascading	A numeric constant, variable, EQUATE, or expression that indicates whether this method was called by itself (recursive). A value of zero (0) indicates a non-recursive call; a value of one (1) indicates a recursive call. This allows the method to stop when it has processed all the related files in a circular relationship. If omitted, *cascading* defaults to zero (0). You should *always* omit this parameter when calling the Close method from your program.

The **Close** method closes this object's primary file (see *Me*) if no other procedure needs it, and any related files, and returns a value indicating its success or failure.

Implementation: The Close method uses the FileManager.Close method to close each file. The Close method returns the FileManager.Close method's return value. See *File Manager Class* for more information.

Return Data Type: BYTE

Example:

```
Relate:Customer.Open          !open Customer and related files
!program code                 !process the files
Relate:Customer.Close         !close Customer and related files
```

See Also: FileManager.Close

Delete (delete record subject to referential constraints)

Delete([*confirm*] **), VIRTUAL**

Delete	Deletes the record from the primary file subject to any specified referential integrity constraints.
confirm	An integer constant, variable, EQUATE, or expression that indicates whether to confirm the delete with the end user. A value of one (1 or True) deletes only on confirmation from the end user; a value of zero (0 or false) deletes without confirmation. If omitted, *confirm* defaults to one (1).

The **Delete** method deletes the current record from the primary file (see *Me*) applying any specified referential integrity constraints, then returns a value indicating its success or failure. The deletes are done within a transaction frame if the Init method's *uselogout* parameter is set to one (1).

Implementation: Delete constraints are specified by the AddRelation method. If the constraint is RI:Restrict, the method deletes the current record only if there are no related child records. If the constraint is RI:Cascade, the method also deletes any related child records. If the constraint is RI:None, the method unconditionally deletes only the primary file record. If the constraint is RI:Clear, the method unconditionally deletes the primary file record, and clears the linking field values in any related child records.

The Delete method calls the primary file FileManager.Throw method to confirm the delete with the end user.

Return Data Type: BYTE

Example:

```
DeleteCustomer PROCEDURE
 CODE
 Relate:Customer.Open                          !Open Customer & related files
 IF NOT GlobalErrors.Throw(Msg:ConfirmDelete) !have user confirm delete
  LOOP                                         !allow retry if delete fails
   IF Relate:Customer.Delete()                 !delete subject to constraints
    IF NOT GlobalErrors.Throw(Msg:RetryDelete)!if del fails, offer to try again
     CYCLE                                    !if user accepts, try again
    END                                       ! otherwise, fall thru
   END                                        !if del succeeds or user declines
  UNTIL 1                                     ! fall out of loop
 END
```

See Also: AddRelation, Init

GetNbFiles(returns number of children)

GetNbFiles(*relationmanager***)**

GetNbFiles	Returns the number of child files
relationmanager	The label of the related file's RelationManager object.

The **GetNbFiles** method returns the number of child files related to this objects primary file.

Return Data Type: LONG

GetNbRelations(returns number of relations)

GetNbRelations

The **GetNbRelations** method returns the number of relations defined for this objects primary file.

Return Data Type: LONG

GetRelation(returns reference to relation manager)

GetRelation(|*relationposition* **|**)

|*relatedfile* |

GetRelation Returns a reference to the objects relation manager.

relationposition An integer constant, variable, EQUATE or expresssion that contains the relation number for the objects primary file.

relatedfile The label of the file to query relations.

The **GetRelation** method returns a reference to the objects relation manager based on the specified relation position or related file.

GetRelation(*relationposition*)
Returns the relation manager for the specified *relationposition* in the internal list of relations.

GetRelation(*relatedfile*)
Returns the relation manager for the specified file.

Return Data Type: *RelationManager

GetRelationType(returns relation type)

GetRelationType(*whichrelation***)**

GetRelationType Returns the type of relation for the objects primary file.

whichrelation An integer constant, variable, EQUATE or expresssion that contains the relation number.

The **GetRelationType** method returns the type of the relation for the specified relation number.

Implementation: The GetRelationType method returns a –1 when *whichrelation* is not a valid relation number. It returns a one (1) if the relationship is determined to be a one-to-many relationship. It returns a zero (0) for all other relation types.

Return Data Type: LONG

Init (initialize the RelationManager object)

Init(*filemanager* [,*uselogout*] **)**

Init	Initializes the RelationManager object.
filemanager	The label of the FileManager object for the RelationManager's primary file. By definition, the file referenced by this FileManager object is the RelationManager's primary file.
uselogout	A numeric constant, variable, EQUATE, or expression that determines whether cascaded updates or deletes are done within a transaction frame (LOGOUT/COMMIT). A value of zero (0) indicates no transaction framing; a value of one (1) indicates transaction framing. If omitted, *logout* defaults to zero (0).

The **Init** method initializes the RelationManager object. To implement the RelationManager's transaction framing, all the files within a transaction must use the same file driver and that file driver must support LOGOUT.

Implementation: The Init method sets the value of the Me and UseLogout properties. The ABC Templates set the *uselogout* parameter based on the **Enclose RI code in transaction frame** check box in the **Global Properties** dialog.

Example:

```
 PROGRAM
 INCLUDE('FILE.INC')                    !declare RelationManager class
Access:Client  CLASS(FileManager)       !declare Access:Client class
Init           PROCEDURE
               END

Client      FILE,DRIVER('TOPSPEED'),PRE(CLI),THREAD !declare Client file
IDKey        KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record       RECORD,PRE()
ID            LONG
Name          STRING(20)
StateCode     STRING(2)
             END
            END
  CODE
  Access:Client.Init                      !initialize Access:Client obj
  Relate:Client.Init(Access:Client,1)     !init Relate:Client--use logout
  Relate:Client.AddRelation( Relate:States )!relate Client to States file
  !program code
  Relate:Client.Kill               !shut down Relate:Client object
  Access:Client.Kill               !shut down Access:Client object
```

See Also: Me

Kill (shut down the RelationManager object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Example:

```
 PROGRAM
 INCLUDE('FILE.INC')                          !declare RelationManager class

Access:Client  CLASS(FileManager)             !declare Access:Client class
Init           PROCEDURE
               END

Client   FILE,DRIVER('TOPSPEED'),PRE(CLI),THREAD !declare Client file
IDKey     KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record    RECORD,PRE()
ID         LONG
Name       STRING(20)
StateCode  STRING(2)
          END
         END
  CODE
  Access:Client.Init                           !initialize Access:Client obj
  Relate:Client.Init(Access:Client,1)          !init Relate:Client--use logout
  Relate:Client.AddRelation( Relate:States ) !relate Client to States file
  !program code
  Relate:Client.Kill                           !shut down Relate:Client object
  Access:Client.Kill                           !shut down Access:Client object
```

ListLinkingFields (map pairs of linked fields)

ListLinkingFields(*relationmanager, fieldpairs* [, *recursed*] **)**

ListLinkingFields	Maps pairs of linking fields between the primary file and a related file.
relationmanager	The label of the related file's RelationManager object.
fieldpairs	The label of the FieldPairsClass object to receive the linking field references.
recursed	A numeric constant, variable, EQUATE, or expression that indicates whether this method was called by itself (recursive). A value of zero (0) indicates a non-recursive call; a value of one (1) indicates a recursive call. This allows the method to get the list of linking fields from the *relationmanager* if necessary--since only one side of the relationship maintains the list of linking fields. If omitted, *recursed* defaults to zero (0). You should *always* omit this parameter when calling the ListLinkingFields method from your program.

The **ListLinkingFields** method maps pairs of linking fields between the primary file and a related file.

Implementation: The RelationManager object does not use the resulting mapped fields, but provides this mapping service for the ViewManager class, etc.

Example:

```
ViewManager.AddRange PROCEDURE(*? Field,RelationManager MyFile,RelationManager HisFile)
 CODE                                      !add range limit to view
 SELF.Order.LimitType = Limit:File         !set limit type: relationship
 MyFile.ListLinkingFields(HisFile,SELF.Order.RangeList)!get linking fields
 ASSERT(RECORDS(SELF.Order.RangeList.List)) !confirm Range limits exist
 SELF.SetFreeElement                       !set free key element
```

Open (open a file and any related files)

Open(*cascading* **), VIRTUAL, PROC**

Open	Opens this object's primary file (see *Me*) and any related files.
cascading	A numeric constant, variable, EQUATE, or expression that indicates whether this method was called by itself (recursive). A value of zero (0) indicates a non-recursive call; value of one (1) indicates a recursive call. This allows the method to stop when it has processed all the related files in a circular relationship. If omitted, *cascading* defaults to zero (0). You should *always* omit this parameter when calling the Open method from your program.

The **Open** method Opens this object's primary file (see *Me*) and any related files, and returns a value indicating its success or failure.

Implementation: The Open method uses the FileManager.Open method to Open each file. The Open method returns the FileManager.Open method's return value. See *File Manager Class* for more information.

Return Data Type: BYTE

Example:

```
Relate:Customer.Open       !open Customer and related files
!program code              !process the files
Relate:Customer.Close      !Close Customer and related files
```

See Also: FileManager.Open

Save (copy the current record and any related records)

Save, VIRTUAL

The **Save** method copies the current record in the primary file and any related files. The copies may be used to detect subsequent changes to the current record or restore the current record to its previous state.

Implementation: The Save method uses the BufferedPairsClass.AssignLeftToBuffer method to Save each record. See Field Pairs Classes for more information.

SetAlias (set a file alias)

SetAlias(*relationmanager* **)**

SetAlias Identifies an alias of this object's primary file.

relationmanager The label of the alias file's RelationManager object.

The **SetAlias** method identifies an alias of this RelationManager object's primary file so that, when appropriate, the RelationManager only processes the file one time. For example, if both the primary file and its alias are part of a framed transaction (LOGOUT/COMMIT), the RelationManager recognizes the alias and appropriately applies the LOGOUT only to the primary file.

Example:

```
Customer FILE,DRIVER('TOPSPEED'),PRE(CLI),NAME('Customer') !declare Customer file
IDKey    KEY(CLI:ID),NOCASE,OPT,PRIMARY
Record    RECORD,PRE()
ID          LONG
Name        STRING(20)
          END
         END

Client FILE,DRIVER('TOPSPEED'),PRE(CUS),NAME('Customer') !declare Client 'alias'
IDKey   KEY(CUS:ID),NOCASE,OPT,PRIMARY
Record  RECORD,PRE()
ID       LONG
Name     STRING(20)
        END
       END

Relate:Customer.SetAlias( Relate:Client )  !Client = alias of Customer
```

SetQuickScan (enable QuickScan on a file and any related files)

SetQuickScan(*on* [,*propagate*] **), VIRTUAL**

SetQuickScan Enables or disables quick scanning on this object's primary file and on the *propagate*d related files.

on A numeric constant, variable, EQUATE, or expression that enables or disables quick scanning. A value of zero (0) disables quick scanning; a value of one (1) enables quick scanning.

propagate A numeric constant, variable, EQUATE, or expression that indicates which related files to include. Valid propogation options are none, one:many, many:one, and all. If omitted, *propagate* defaults to none.

The **SetQuickScan** method enables or disables quick scanning on this object's primary file and on the *propagated* related files.

Implementation: The SetQuickScan method SENDs the QUICKSCAN driver string to the file driver for each specified file. The QUICKSCAN driver string is supported by the ASCII, BASIC, and DOS drivers. See *Database Drivers* for more information.

Corresponding EQUATEs for the valid propagate options are declared in FILE.INC as follows:

```
    ITEMIZE(0),PRE(Propagate)
None    EQUATE       !do primary file only, no related files
OneMany EQUATE       !do 1-Many relations only
ManyOne EQUATE       !do Many-1 relations only
All     EQUATE       !do all related files
    END
```

Example:

```
Relate:Customer.SetQuickScan(1,Propagate:OneMany) !enable quickscan for 1:Many
Relate:Orders.SetQuickScan(1)                     !enable quickscan for primary
Relate:Orders.SetQuickScan(0)                     !disable quickscan for primary
```

Update (update record subject to referential constraints)

Update(*fromform* **), VIRTUAL**

Update	Updates this object's primary file (see *Me*) subject to the specified referential integrity constraints.
fromform	A numeric constant, variable, EQUATE, or expression that indicates whether this method was called from a (form) procedure with field history (restore) capability. A value of zero (0) indicates no restore capability; a value of one (1) indicates restore capability. This allows the method to issue an appropriate message when the update fails.

The **Update** method updates the current record in the primary file (see *Me*) applying any specified referential integrity constraints, then returns a value indicating its success or failure.

Implementation: Update constraints are specified by the AddRelation method and they apply to the values in the linking fields. If the constraint is RI:Restrict, the method does not update the current record if the change would result in orphaned child records. If the constraint is RI:Cascade, the method updates the primary file record as well as the linking field values in any related child records. If the constraint is RI:None, the method unconditionally updates only the primary file record. If the constraint is RI:Clear, the method unconditionally updates the primary file record, and clears the linking field values in any related child records.

Return Data Type: BYTE

Example:

```
ChangeOrder ROUTINE
 IF Relate:Orders.Update(0)         !update subject to constraints
  MESSAGE('Update Failed')          ! if fails, acknowledge
 ELSE                               ! otherwise
  POST(Event:CloseWindow)           ! shut down
 END
```

See Also: AddRelation

ReportManager Class

ReportManager Overview

The ReportManager is a WindowManager that uses a ProcessClass object to process report records in the background, and optionally uses a PrintPreviewClass object to provide a full-featured print preview facility.

ReportManager Concepts

The ReportManager supports a batch report procedure, complete with progress window, print preview, DETAIL specific record filtering, and optimized sharing of machine resources.

ReportManager Relationship to Other Application Builder Classes

The ReportManager is derived from the WindowManager because it supports a progress window to provide appropriate visual feedback to the end user (see *WindowManager* for more information).

The ReportManager uses the ProcessClass to manage the batch processing of the REPORT's underlying VIEW. The ReportManager optionally uses the PrintPreviewClass to provide a full-featured print preview for the report.

If your program instantiates the ReportManager, it should also instantiate the ProcessClass and may need the PrintPreviewClass as well. Much of this is automatic when you INCLUDE the ReportManager header (ABREPORT.INC) in your program's data section. See the Conceptual Example.

ReportManager ABC Template Implementation

The Report Procedure template and the Report Wizard Utility template automatically generate all the code and include all the classes necessary to support your application's template generated reports.

These Report templates generate code to instantiate a ReportManager object called ThisWindow for each report procedure. The Report templates also instantiate a ProcessClass object and optionally a PrintPreviewClass object for the ThisWindow object to use.

The ThisWindow object supports all the functionality specified in the Report template's **Report Properties** dialog. See *Procedure Templates--Report* for more information.

ReportManager Source Files

The ReportManager source code is installed by default to the Clarion \LIBSRC folder. The ReportManager source code and their respective components are contained in:

ABREPORT.INC	ReportManager declarations
ABREPORT.CLW	ReportManager method definitions

ReportManager Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use and terminate a ReportManager and related objects.

This example uses the ReportManager object to preview a very simple report before printing it. The program specifies a maximized print preview window.

```
   PROGRAM
   INCLUDE('ABREPORT.INC')          !declare ReportManager &
                                    ! and PrintPreviewClass
  MAP
  END

GlobalErrors ErrorClass
VCRRequest  LONG(0),THREAD

Customer   FILE,DRIVER('TOPSPEED'),PRE(CUS),THREAD
BYNUMBER    KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record      RECORD,PRE()
CUSTNO       LONG
Name         STRING(30)
State        STRING(2)
            END
           END

Access:Customer CLASS(FileManager)         !declare Access:Customer object
Init            PROCEDURE
                END
Relate:Customer CLASS(RelationManager)     !declare Relate:Customer object
Init            PROCEDURE
                END
CusView     VIEW(Customer)                 !declare CusView VIEW
            END
PctDone     BYTE                           !track progress variable

report  REPORT,AT(1000,1542,6000,7458),PRE(RPT),FONT('Arial',10,,),THOUS
      HEADER,AT(1000,1000,6000,542),FONT(,,,FONT:bold)
       STRING('Customers'),AT(2000,20),FONT(,14,,)
       STRING('Id'),AT(52,313),TRN
       STRING('Name'),AT(2052,313),TRN
       STRING('State'),AT(4052,313),TRN
      END
detail   DETAIL,AT(,,6000,281),USE(?detail)
       STRING(@n-14),AT(52,52),USE(CUS:CUSTNO)
       STRING(@s30),AT(2052,52),USE(CUS:NAME)
```

```
       STRING(@s2),AT(4052,52),USE(CUS:State)
      END
      FOOTER,AT(1000,9000,6000,219)
       STRING(@pPage <<<#p),AT(5250,31),PAGENO,USE(?PageCount)
      END
     END

ProgressWindow WINDOW('Progress...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
         PROGRESS,USE(PctDone),AT(15,15,111,12),RANGE(0,100)
         STRING(''),AT(0,3,141,10),USE(?UserString),CENTER
         STRING(''),AT(0,30,141,10),USE(?TxtDone),CENTER
         BUTTON('Cancel'),AT(45,42),USE(?Cancel)
        END

ThisProcedure CLASS(ReportManager)        !declare ThisProcedure object
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
        END

CusReport   CLASS(ProcessClass)           !declare CusReport object
TakeRecord   PROCEDURE(),BYTE,PROC,VIRTUAL
        END

Previewer   PrintPreviewClass             !declare Previewer object
                                          ! for use with ThisProcedure
  CODE
  ThisProcedure.Run()                     !run the report procedure

ThisProcedure.Init  PROCEDURE()           !initialize ThisProcedure
ReturnValue      BYTE,AUTO
  CODE
  GlobalErrors.Init
  Relate:Customer.Init
  ReturnValue = PARENT.Init()
  SELF.FirstField = ?PctDone
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors             !set error handler for ThisProcedure
  Relate:Customer.Open                    !open Customer & related files
  OPEN(ProgressWindow)
  SELF.Opened=True
  !do report specific initialization
  CusReport.Init(CusView,Relate:Customer,?TxtDone,PctDone,RECORDS(Customer))
  CusReport.AddSortOrder(CUS:BYNUMBER)      !set report sort order
  SELF.AddItem(?Cancel,RequestCancelled)    !set action on cancel
  SELF.Init(CusReport,report,Previewer)     !register Previewer & CusReport with
                                            !ThisProcedure
  SELF.Zoom = PageWidth
  Previewer.AllowUserZoom=True              !allow custom zoom factors
```

```
  Previewer.Maximize=True                    !initially maximize preview window
  SELF.SetAlerts()                           !alert keys for ThisProcedure
  RETURN ReturnValue

ThisProcedure.Kill  PROCEDURE()              !shut down ThisProcedure
ReturnValue      BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()                !call base class shut down
  Relate:Customer.Close                      !close Customer & related files
  Relate:Customer.Kill                       !shut down Relate:Customer object
  GlobalErrors.Kill                          !shut down GlobalErrors object
  RETURN ReturnValue

CusReport.TakeRecord PROCEDURE()             !do any per record process
ReturnValue      BYTE,AUTO
SkipDetails      BYTE
  CODE
  ReturnValue = PARENT.TakeRecord()       !standard process for each record
  PRINT(RPT:detail)                       !print detail for each record
  RETURN ReturnValue

Access:Customer.Init PROCEDURE
  CODE
  PARENT.Init(Customer,GlobalErrors)
  SELF.FileNameValue = 'Customer'
  SELF.Buffer &= CUS:Record
  SELF.Create = 0
  SELF.LazyOpen = False
  SELF.AddKey(CUS:BYNUMBER,'CUS:BYNUMBER',0)

Relate:Customer.Init PROCEDURE
  CODE
  Access:Customer.Init
  PARENT.Init(Access:Customer,1)
```

ReportManager Properties

The ReportManager inherits all the properties of the WindowManager class from which it is derived. See *WindowManager Properties* for more information.

In addition to the inherited properties, the ReportManager contains the following properties:

Attribute (ReportAttributeManager object)

Attribute **&ReportAttributeManager, PROTECTED**

The **Attribute** property is a reference to the ReportAttributeManager object that the ReportManager uses to manage the attribute processing of the target report's controls. The Attribute property applies any information set by the report control's EXTEND parameter.

Implementation: The Init method sets the Attribute property.

See Also: Init

BreakMan (BreakManagerClass object)

BreakMan **&BreakManagerClass, PROTECTED**

The **BreakMan** property is a reference to the BreakManagerClass object that the ReportManager uses to manage the customized break processing of the target report. The BreakMan property applies any break information set by the report.

Implementation: The AddItem method sets the BreakMan property.

See Also: AddItem

DeferOpenReport (defer open)

DeferOpenReport BYTE, PROTECTED

The **DeferOpenReport** property controls whether the ReportManager opens the report with the Open method or delays opening the report until the first timer cycle. A value of one (1 or True) delays the open until the first timer cycle; a value of zero (0 or False) opens the report immediately.

The DeferOpenReport property gives you an opportunity to query the end user about items such as filters and sort orders before the report starts printing.

Implementation: The Open and TakeWindowEvent methods implement the behavior specified by the DeferOpenReport property.

See Also: Open, TakeWindowEvent

DeferWindow (defer progress window)

DeferWindow USHORT, PROTECTED

The **DeferWindow** property controls whether the ReportManager opens the progress window with the Open method or delays opening the progress window until the first timer cycle. A value of one (1 or True) delays the open until the first timer cycle; a value of zero (0 or False) opens the window immediately.

The DeferWindow property gives you an opportunity to leave the progress window closed until there are actual records to process.

Implementation: The TakeWindowEvent method implements the behavior specified by the DeferWindow property.

See Also: TakeWindowEvent

KeepVisible (keep progress window visible)

KeepVisible BYTE, PROTECTED

The **KeepVisible** property controls whether the ReportManager closes the progress window before or after the Print Preview window is displayed. A value of one (1 or True) delays the close until after the Print Preview window is closed; a value of zero (0 or False) closes the window prior to the Print Preview window open.

The KeepVisible property gives you an opportunity to leave the progress window open and viewable with the Print Preview. Useful if you have results that you would like to display on the progress window.

Implementation: The TakeCloseEvent method implements the behavior specified by the KeepVisible property.

See Also: TakeCloseEvent

OutputFileQueue (advanced report generation filenames)

OutputFileQueue &OutputFileQueue, PROTECTED

The **OutputFileQueue** property is a reference to a structure containing the full pathnames of the report's file advanced generation output for each report page. The ReportManager object uses this property to provide to output the report after previewing.

Implementation: The ReportManager only uses the OutputFileQueue property if the ReportTarget property is active.

The OutputFileQueue structure is actually an EQUATE to the PrintPreviewFileQueue, and declared in EQUATES.CLW as follows:

```
PrintPreviewFileQueue   QUEUE,TYPE
Filename                   STRING(FILE:MaxFileName)
PrintPreviewImage          STRING(FILE:MaxFileName),OVER(Filename)
                        END
```

Preview (PrintPreviewClass object)

Preview &PrintPreviewClass, PROTECTED

The **Preview** property is a reference to the PrintPreviewClass object the ReportManager uses to provide an online preview of the report.

Implementation: The Init method sets the Preview property.

See Also: Init

PreviewQueue (report metafile pathnames)

PreviewQueue &PreviewQueue, PROTECTED

The **PreviewQueue** property is a reference to a structure containing the full pathnames of the report's Windows metafiles (*.WMF)--one metafile for each report page. The ReportManager object uses this property to provide an online preview of the report, and to print the report after previewing. See *PREVIEW* in the *Language Reference* for more information on report metafiles.

Implementation: The ReportManager only uses the PreviewQueue property if the Preview property is set.

The PreviewQueue structure is declared in ABREPORT.INC as follows:

```
PreviewQueue  QUEUE,TYPE
Filename       STRING(128)
              END
```

See Also: Preview

Process (ProcessClass object)

Process **&ProcessClass, PROTECTED**

The **Process** property is a reference to the ProcessClass object the ReportManager uses to manage the "batch" processing of the report's data. The Process property applies sort orders, range limits, and filters as needed, and supplies appropriate visual feedback to the end user on the progress of the batch process.

Implementation: The Init method sets the Process property.

See Also: Init

QueryControl (query button)

QueryControl SIGNED

The **QueryControl** property contains the number of the reports query control. This is typically the value of the Query BUTTON's field equate. The ReportManager methods use this value to process the report based on a user defined query.

Implementation: The Init method does not initialize the QueryControl property. You should initialize the QueryControl property after the Init method is called. See the *Conceptual Example*. On EVENT:Accepted for the QueryControl, the TakeEvent method calls the TakeLocate method to collect (from the end user) and apply the ad hoc query.

The ABC ProcessReportQBEButton template generates code to declare and support a QBE button.

Report (the managed REPORT)

Report &WINDOW

The **Report** property is a reference to the managed REPORT structure. The ReportManager uses this property to open, print, and close the REPORT.

Implementation: The Init method sets the Report property.

See Also: Init

ReportTarget (IReportGenerator interface)

ReportTarget &IReportGenerator, PROTECTED

The **ReportTarget** property is a reference to the IReportGenerator interface that the ReportManager uses to manage the type of advanced report generation output (Text, PDF, HTML or XML). The ReportTarget property is set by the active TargetSelector property, which is a reference to the ReportTargetSelector Class.

Implementation: The TakeAccepted method of the PrintPreview Class and the SetReportTarget method of the ReportManager sets the ReportTarget property.

See Also: SetReportTarget

SkipPreview (print rather than preview)

SkipPreview BYTE

The **SkipPreview** property controls whether the ReportManager provides an on-line preview when requested, or prints the report instead. A value of one (1 or True) prints rather than previews the report; a value of zero (0 or False) previews the report. The SkipPreview property is only effective if the Preview property is set.

The SkipPreview property lets you suppress the on-line print preview anytime before the AskPreview method executes.

Implementation: The AskPreview method implements the behavior specified by the SkipPreview property.

See Also: AskPreview, Preview

TargetSelector (ReportTargetSelectorClass object)

TargetSelector &ReportTargetSelectorClass, PROTECTED

The **TargetSelector** property is a reference to the ReportTargetSelectorClass object that the ReportManager uses to determine whether to process the report as a standard printed report, or redirect the report output to another output type (Text, PDF, HTML or XML).

Implementation: The Init method of the PrintPreview Class sets the TargetSelector property.

See Also: PrintPreviewClass.Init , Init

TargetSelectorCreated (report target active)

TargetSelectorCreated BYTE, PROTECTED

The **TargetSelectorCreated** property is used to signal the ReportManager that a report redirection to an alternative output (Text, PDF, HTML or XML) is active.

Implementation: The Init method of the ReportManager sets the TargetSelectorCreated property.

See Also: Init

TimeSlice (report resource usage)

TimeSlice USHORT

The **TimeSlice** property contains the amount of time in hundredths of a second the ReportManager tries to "fill up" for each processing "cycle." A cycle begins with an EVENT:Timer (see *TIMER* in the *Language Reference*), and ends about TimeSlice later. For example, for a TimeSlice of 100, the ReportManager processes as many records as it can within about 100/100 (one) second before yielding control back to the operating system. To provide efficient sharing of machine resources, we recommend setting the TIMER to something less than or equal to TimeSlice.

Implementation: The Init method sets TimeSlice to one (100). The TakeWindowEvent method continuously adjusts adjusts the number of records processed per cycle to fill the specified TimeSlice--that is, to process as many records as possible within the TimeSlice. This provides both efficient report processing and reasonable sharing of machine resources, provided the TIMER value is less than or equal to the TimeSlice value. This leaves the user in control in a multi-tasking environment, especially when processing a large data set.

See Also: Init, TakeWindowEvent

WaitCursor (activate Wait cursor during report processing)

WaitCursor BYTE, PROTECTED

The **WaitCursor** property is used to signal the ReportManager that a wait cursor will be active as the report is generating. A value of one (1 or True) activates the wait cursor; a value of zero (0 or False) uses the default.

Implementation: The Ask method of the ReportManager implements the WaitCursor property.

See Also: Ask

WMFParser (WMFDocumentParser object)

WMFParser &WMFDocumentParser, PROTECTED

The **WMFParser** property is a reference to the WMFDocumentparser object that the ReportManager uses to process embedded attributes and data from the generated Windows metafiles (*.WMF).

Implementation: The Init method of the Reportmanger sets the WMFparser property.

See Also: Init

Zoom (initial report preview magnification)

Zoom SHORT

The **Zoom** property controls the initial zoom or magnification factor for the on-line report preview. A value of zero (0) uses the PrintPreviewClass object's default zoom setting. Any other value specifies the initial preview zoom factor.

The Zoom property lets you override the PrintPreviewClass object's default zoom setting. The PrintPreviewClass object determines the actual zoom factor applied.

The Zoom property is only effective if the Preview property is set.

Implementation: The AskPreview method implements the behavior specified by the Zoom property by passing the Zoom value to the PrintPreviewClass.Display method.

If the PrintPreviewClass object allows custom zoom factors, then the initial magnification equals the Zoom value (81 gives 81%, 104 gives 104%, etc.). If the PrintPreviewClass object only supports a limited set of discrete magnifications, the initial magnification is the one closest to the Zoom value (81 gives 75%, 104 gives 100%, etc.).

See Also: AskPreview, Preview, PrintPreviewClass.ZoomIndex

ReportManager Methods

The ReportManager inherits all the methods of the WindowManager class from which it is derived. See *WindowManager Methods* for more information.

ReportManager Functional Organization--Expected Use

As an aid to understanding the ReportManager, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ReportManager methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the ReportManager object
Askv	display window and process its events
Killv	shut down the ReportManager object

v These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Ask	display window and process its events
AskPreview	preview or print the report
CancelPrintReport	cancels printing of report
EndReport	close the report
Kill	shut down the ReportManager object
Next	get next report record
Open	prepare progress window
OpenReport	prepare report for execution
PrintReport	prints the report
ProcessResultFiles	process redirected output
SetDynamicControlsAttributes	set control attributes prior to band printing
SetStaticControlsAttributes	set control attributes after report is opened
TakeNoRecords	handle empty report
TakeCloseEvent	process EVENT:CloseWindow events
TakeWindowEvent	process non-field events

AddItem (program the ReportManager object)

AddItem(*RecordProcessor***)**

AddItem	Adds specific functionality to the ReportManager.
RecordProcessor	The label of a RecordProcessor interface.

The AddItem method registers an ABC Library interface with the ReportManager object and adds the interface's specific functionality to the ReportManager.

Ask (display window and process its events:ReportManager)

Ask, VIRTUAL

The **Ask** method initiates the event processing (ACCEPT loop) for the report procedure. This virtual method handles any special processing immediately before or after the report procedure's event processing.

Implementation: The Run method calls the Ask method. The Ask method calls the PARENT.Ask method to manage the ACCEPT loop for the report procedure.

Example:

```
MyReporter.Ask PROCEDURE
 CODE
 SETCURSOR(CURSOR:Wait)        !special pre event handling code
 PARENT.Ask                    !process events (ACCEPT)
 SETCURSOR()                   !special post event handling code
```

See Also: WindowManager.Ask, WindowManager.Run

AskPreview (preview or print the report)

AskPreview, VIRTUAL

The **AskPreview** method previews or prints the report, only if the Preview property references an operative PrintPreviewClass object.

If the SkipPreview property is true, AskPreview does not preview the report, but prints it instead.

Implementation: The TakeCloseEvent method calls the AskPreview method to print or preview the report. The AskPreview method calls the PrintPreviewClass.Display method to preview the report.

Typically, the Init method sets the Preview reference.

Example:

```
MyReporter.TakeCloseEvent PROCEDURE
 CODE
 IF EVENT() = EVENT:CloseWindow
  SELF.AskPreview()
  IF ~SELF.Report&=NULL
   CLOSE(SELF.Report)
  END
 END
 RETURN Level:Benign
```

See Also: Ask, PrintPreviewClass.Display, Init, Preview, SkipPreview

CancelPrintReport (cancel report printing)

CancelPrintReport, VIRTUAL

The **CancelPrintReport** method is a virtual method that allows you to write any clean up code to execute when canceling in a Print Preview window.

Implementation: The AskPreview method CancelPrintReport method. The method is empty, but generates an embed point to allow custom code to be implemented.

Example:

```
ReportManager.AskPreview PROCEDURE

  CODE
  IF NOT SELF.Report &= NULL AND SELF.Response = RequestCompleted
    IF SELF.EndReport()=Level:Benign
      IF NOT SELF.Preview &= NULL
        IF CHOOSE (NOT SELF.SkipPreview, SELF.Preview.Display(SELF.Zoom), TRUE)
          SELF.PrintReport()
        ELSE
          SELF.CancelPrintReport()
        END
        FREE(SELF.Preview.ImageQueue)
      ELSE
        SELF.PrintReport()
        FREE(SELF.PreviewQueue)
      END
    ELSIF NOT SELF.Preview &= NULL
      FREE(SELF.Preview.ImageQueue)
    ELSE
      FREE(SELF.PreviewQueue)
    END
  END
```

EndReport (close the report)

EndReport, VIRTUAL

The **EndReport** method prepares the report to close and returns a value indicating success or failure. This is a good place to add a final print summary or last page. Valid return value is

```
Level:Benign        report closed successfully
```

Implementation: The EndReport method is called by the ReportManager's AskPreview method.

It checks to see if any final break logic needs to be processed by the BreakManager, then issues an ENDPAGE statement. You can use the method's embed point to perform any post processing needed prior to closing the report and accessing the Preview window.

Return Data Type: BYTE

Example:

```
ReportManager.AskPreview PROCEDURE

  CODE
  IF NOT SELF.Report &= NULL AND SELF.Response = RequestCompleted
    IF SELF.EndReport()= Level:Benign
      IF NOT SELF.Preview &= NULL
        IF CHOOSE (NOT SELF.SkipPreview, SELF.Preview.Display(SELF.Zoom), TRUE)
          SELF.PrintReport()
        ELSE
          SELF.CancelPrintReport()
        END
        FREE(SELF.Preview.ImageQueue)
      ELSE
        SELF.PrintReport()
        FREE(SELF.PreviewQueue)
      END
    ELSIF NOT SELF.Preview &= NULL
      FREE(SELF.Preview.ImageQueue)
    ELSE
      FREE(SELF.PreviewQueue)
    END
  END
```

Init (initialize the ReportManager object)

Init(*process object* [, *report*] [, *preview object*] **)**

Init	Initializes the ReportManager object.
process object	The label of the ProcessClass object the ReportManager uses to batch process the *report* VIEW and provide appropriate visual feedback to the end user on the progress of the *report*.
report	The label of the managed REPORT structure. If omitted, the ReportManager becomes a batch VIEW processor with automatic resource management.
preview object	The label of the PrintPreviewClass object the ReportManager uses to preview or print the *report*. If omitted, the ReportManager prints the report without generating preview image files.

The **Init** method does the report-specific initialization of the ReportManager object. This Init method is in addition to the Init method inherited from the WindowManager class which does general window procedure initialization.

Implementation: Typically, the Init method calls the Init(*process, report, preview*) method to do report-specific intialization. The Init method sets the Preview, Process, Report, and TimeSlice properties.

Example:

```
PrintPhones   PROCEDURE
report REPORT,AT(1000,1540,6000,7460),PRE(RPT)
detail  DETAIL,AT(,,6000,280)
         STRING(@s20),AT(50,50,5900,170),USE(PHO:Number)
        END
       END
Previewer  PrintPreviewClass            !declare Previewer object
Process    ProcessClass                 !declare Process object
ThisWindow CLASS(ReportManager)         !declare derived ThisWindow object
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END
!procedure data
 CODE
  ThisWindow.Run                        !run the procedure (init,ask,kill)
ThisWindow.Init PROCEDURE()
  CODE
 !procedure code
  ThisWindow.Init(Process,report,Previewer)   !call the report-specific Init
 !procedure code
```

See Also: WindowManager.Init

Kill (shut down the ReportManager object)

Kill, VIRTUAL, PROC

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code. Kill returns a value to indicate the status of the shut down. Valid return values are:

Level:Benign	normal shut down
Level:Notify	no action taken

Implementation: The Run method calls the Kill method. If the Dead property is True, Kill returns Level:Notify and takes no other action. Otherwise, the Kill method, among other things, calls the WindowManager.Kill method.

Return value EQUATEs are declared in ABERROR.INC.

Return Data Type: BYTE

Example:

```
ThisWindow.Kill PROCEDURE()
 CODE
 IF PARENT.Kill() THEN RETURN Level:Notify.
 IF FilesOpened
  Relate:Defaults.Close
 END
 IF SELF.Opened
  INIMgr.Update('Main',AppFrame)
 END
 GlobalResponse = CHOOSE(LocalResponse=0,RequestCancelled,LocalResponse)
```

See Also: WindowManager.Dead, WindowManager.Run

Next (get next report record)

Next, VIRTUAL, PROC

The **Next** method gets the next report record and returns a value indicating whether the the report is completed, cancelled, or in progress. Valid return values are:

Level:Benign	proceeding normally
Level:Notify	completed normally
Level:Fatal	cancelled or ended abnormally

Implementation: The Next method calls the ProcessClass.Next method to get the next report record. When the report is completed or canceled, the Next method sets the Response property and POSTs an EVENT:CloseWindow to end the progress window procedure.

Return Data Type: BYTE

Example:

```
ReportManager.Open  PROCEDURE
 CODE
  PARENT.Open
  SELF.Process.Reset
  IF ~SELF.Next()
   IF ~SELF.Report&=NULL
    OPEN(SELF.Report)
    IF ~SELF.Preview &= NULL
     SELF.Report{PROP:Preview} = SELF.PreviewQueue.Filename
    END
   END
  END
```

See Also: ProcessClass.Next, WindowManager.Response

Open (a virtual to execute on EVENT:OpenWindow--ReportManager)

Open, VIRTUAL

The **Open** method prepares the progress window for display. It is designed to execute on window opening events such as EVENT:OpenWindow.

Implementation: The TakeWindowEvent method calls the Open method. The Open method calls the WindowManager.Open method, then conditionally (based on the DeferOpenReport property) calls the OpenReport method to reset the ProcessClass object and get the first report record.

Example:

```
WindowManager.TakeWindowEvent PROCEDURE
RVal BYTE(Level:Benign)
 CODE
 CASE EVENT()
  OF EVENT:OpenWindow
   IF ~BAND(SELF.Inited,1)
    SELF.Open                  !handle EVENT:OpenWindow
   END
   IF SELF.FirstField
    SELECT(SELF.FirstField)
   END
  OF EVENT:LoseFocus
   IF SELF.ResetOnGainFocus
    SELF.ForcedReset = 1
   END
  OF EVENT:GainFocus
   IF BAND(SELF.Inited,1)
    SELF.Reset
   ELSE
    SELF.Open                  !handle EVENT:GainFocus
   END
  OF EVENT:Completed
   RVal = SELF.TakeCompleted()
  OF EVENT:CloseWindow OROF EVENT:CloseDown
   RVal = SELF.TakeCloseEvent()
 END
 RETURN RVal
```

See Also: DeferOpenReport, OpenReport, WindowManager.Open, WindowManager.TakeWindowEvent

OpenReport (prepare report for execution)

OpenReport, PROC, PROTECTED, VIRTUAL

The **OpenReport** method prepares the report to execute and returns a value indicating success or failure. This is a good place to add any filters or keys specified at runtime. Valid return values are:

Level:Benign	report opened successfully
Level:Notify	no records found
Level:Fatal	failed, cause unknown

Implementation: The TakeWindowEvent method or the Open method calls the OpenReport method depending on the value of the DeferOpenReport property. The OpenReport method calls the Process.Reset method to reset the ProcessClass object, calls the Next method to get the first report record, then opens the REPORT structure.

The OpenReport method resets the DeferOpenReport property to zero so that if deferred, the OpenReport only happens with the first timer event.

Return Data Type: BYTE

Example:

```
ReportManager.Open  PROCEDURE
  CODE
 PARENT.Open
 IF ~SELF.DeferOpenReport
  SELF.OpenReport         !call OpenReport if not deferred
 END

MyReportManager.TakeWindowEvent PROCEDURE
!procedure data
  CODE
 IF EVENT() = EVENT:Timer
  IF SELF.DeferOpenReport
   SELF.OpenReport        !if deferred, call OpenReport on timer
  ELSE
 !procedure code
```

```
MyReportManager.OpenReport  PROCEDURE
  CODE
 SELF.Process.SetFilter(UserFilter)  !set dynamic filter
 SELF.DeferOpenReport = 0
 SELF.Process.Reset
 IF ~SELF.Next()
  IF ~SELF.Report&=NULL
   OPEN(SELF.Report)
   IF ~SELF.Preview &= NULL
    SELF.Report{PROP:Preview} = SELF.PreviewQueue.Filename
   END
  END
 END
```

See Also: DeferOpenReport, Next, Open, TakeWindowEvent, Process.Reset

PrintReport (print the report)

PrintReport, VIRTUAL

The **PrintReport** method is used to determine where a report output will be redirected. Based on the ReportTarget value, the report will be processed via the WMFparser, or as a standard report is handled by the ProcessResultFiles method.

Implementation: The PrintReport method is called by the ReportManager's AskPreview method.

Example:

```
ReportManager.AskPreview PROCEDURE
  CODE
  IF NOT SELF.Report &= NULL AND SELF.Response = RequestCompleted
    IF SELF.EndReport()=Level:Benign
      IF NOT SELF.Preview &= NULL
        IF CHOOSE (NOT SELF.SkipPreview, SELF.Preview.Display(SELF.Zoom), TRUE)
          SELF.PrintReport() !Print after previewing
        ELSE
          SELF.CancelPrintReport()
        END
        FREE(SELF.Preview.ImageQueue)
      ELSE
        SELF.PrintReport()   !Print without previewing
        FREE(SELF.PreviewQueue)
      END
    ELSIF NOT SELF.Preview &= NULL
      FREE(SELF.Preview.ImageQueue)
    ELSE
      FREE(SELF.PreviewQueue)
    END
  END
```

ProcessResultFiles (process generated output files)

ProcessResultFiles (*OutputFileQueue* **), VIRTUAL**

The **ProcessResultFiles** virtual method is provided as an entry point to process the contents of the *OutputFileQueue* before the queue is freed and the report is either saved to disk in one of several formats, or sent to the printer.

Implementation: The ProcessResultFiles method is called by the ReportManager's PrintReport method. By default, the method returns Level:Benign. If any other value is returned, the report's printing will be aborted.

Return Data Type: BYTE

Example:

```
ReportManager.PrintReport         PROCEDURE()
Rt      BYTE
lIndex  SHORT
  CODE
! Used select the target at the beginning if this is not a standard report
   IF NOT SELF.ReportTarget &= NULL THEN
    IF RECORDS(SELF.PreviewQueue) THEN
     IF SELF.ReportTarget.SupportResultQueue()=True THEN
      SELF.ReportTarget.SetResultQueue(SELF.OutputFileQueue)
     END
     IF SELF.ReportTarget.AskProperties(False)=Level:Benign THEN
      SELF.WMFParser.Init(SELF.PreviewQueue, SELF.ReportTarget, SELF.Errors)
      IF SELF.WMFParser.GenerateReport()=Level:Benign THEN
       IF SELF.ReportTarget.SupportResultQueue()=True THEN
        Rt = SELF.ProcessResultFiles(SELF.OutputFileQueue) !after generating
       END
      END
     END
    END
   ELSE
    FREE(SELF.OutputFileQueue)
    LOOP lIndex=1 TO RECORDS(SELF.PreviewQueue)
     GET(SELF.PreviewQueue,lIndex)
     IF NOT ERRORCODE() THEN
      SELF.OutputFileQueue.FileName = SELF.PreviewQueue.FileName
      ADD(SELF.OutputFileQueue)
     END
    END
    !prior to flushing to printer
    IF SELF.ProcessResultFiles(SELF.OutputFileQueue)=Level:Benign THEN
     SELF.Report{PROP:FlushPreview} = True
    ELSE
     SELF.Report{PROP:FlushPreview} = FALSE
    END
   END
```

SetReportTarget (set ReportGenerator target)

SetReportTarget (*IReportGenerator pReportTarget* **)**

The SetReportTarget method sets the report's target output as passed by the IReportGenerator interface. This target can be text, HTML, PDF or XML formats.

SetStaticControlsAttributes (set report's static controls)

SetStaticControlsAttributes, VIRTUAL

The **SetStaticControlsAttributes** method is a virtual method used to set any static attribute property on a report's controls prior to opening the report. The control must have the EXTEND attribute applied. This method is used to set attributes that will be recognized by the WMFParser to generate a particular output format.

Implementation: The **SetStaticControlsAttributes** method is a vrtual method called by the ReportManager's Open method.

Example:

```
ReportManager.Open  PROCEDURE
  CODE
    PARENT.Open
    IF ~SELF.DeferOpenReport
      SELF.OpenReport
      IF NOT SELF.OpenFailed THEN
         IF SELF.Report{PROPPRINT:Extend}=1 THEN
            SELF.SetStaticControlsAttributes()
         END
      END
    END
```

SetDynamicControlsAttributes (set report's static controls)

SetDynamicControlsAttributes, VIRTUAL

The **SetDynamicControlsAttributes** method is a virtual method used to set any dynamic attribute property on a report's controls as each record is processed. The control must have the EXTEND attribute applied. This method is used to set attributes that will be recognized by the WMFParser to generate a particular output format.

Implementation: The **SetDynamicControlsAttributes** method is a vrtual method called by the ReportManager's TakeRecord method.

Example:

```
ReportManager.TakeRecord PROCEDURE
I            LONG,AUTO
RVal         BYTE(Level:Benign)
  CODE
    IF ~SELF.BreakMan &= NULL THEN
        SELF.BreakMan.AskBreak()
    END
    IF SELF.Report{PROPPRINT:Extend}=1 THEN
       SELF.SetDynamicControlsAttributes()
    END
    RVal = SELF.Process.TakeRecord()
    DO CheckState
    LOOP I = 1 TO RECORDS(SELF.Processors)
      GET(SELF.Processors,I)
      RVal = SELF.Processors.P.TakeRecord()
      DO CheckState
    END
    IF SELF.Next() THEN
      TARGET{PROP:Timer} = 0
      RETURN Level:Notify
    END
RETURN Rval
```

TakeAccepted (process Accepted event)

TakeAccepted, PROC, PROTECTED, DERIVED

The **TakeAccepted** method processes the accepted event for the ReportManager. This occurs after each record is read. This method processes the record according to the end user query (filter) set by the ProcessReportQBEButton.

Return Data Type: BYTE

See Also: ProcessClass.TakeLocate

TakeCloseEvent (a virtual to process EVENT:CloseWindow)

TakeCloseEvent, VIRTUAL, PROC

The **TakeCloseEvent** method handles EVENT:CloseWindow for the ReportManager and returns a value indicating whether window ACCEPT loop processing is complete and should stop.

TakeCloseEvent returns returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeEvent method calls the TakeCloseEvent method. The TakeCloseEvent method calls the AskPreview method to preview or print the report, then closes the report.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: AskPreview, WindowManager.TakeEvent

TakeNoRecords (process empty report)

TakeNoRecords, VIRTUAL

The **TakeNoRecords** method implements any special processing required for a report with no records.

Implementation: The OpenReport method calls the TakeNoRecords method. The TakeNoRecords method issues a message indicating there are no records, and therefore no report.

You can use the TakeNoRecords method to print a page indicating an empty report. The default action is to issue the message and print nothing.

Example:

```
MyReportr.TakeNoRecords PROCEDURE
 CODE
 PARENT.TakeNoRecords
 CLI:CustomerName = 'No Customers'
 PRINT(CustomerDetail)
```

See Also: OpenReport

TakeRecord(process each record)

TakeRecord, VIRTUAL, PROC

The **TakeRecord** method processes each item in the result set. It returns a value indicating whether processing should continue or should stop. TakeRecord returns Level:Benign to indicate processing should continue normally; it returns Level:Notify to indicate processing is completed and should stop.

Return Data Type: BYTE

See Also: ProcessClass.TakeRecord

TakeWindowEvent (a virtual to process non-field events:ReportManager)

TakeWindowEvent, VIRTUAL, PROC

The **TakeWindowEvent** method processes all non-field events for the progress window and returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeWindowEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeEvent method calls the TakeWindowEvent method.

The TakeWindowEvent method processes EVENT:Timer events for the report. The TakeWindowEvent method either calls OpenReport (if DeferOpenReport is True) or begins processing a "cycle" of report records. Each timer event begins a "cycle" of report record processing which ends about TimeSlice later.

TakeWindowEvent calls the TakeRecord method and the Next method for each record within a processing cycle.

TakeWindowEvent adjusts the number of records processed per cycle to fill the TimeSlice and optimize sharing of machine resources.

Finally, TakeWindowEvent calls the WindowManager.TakeWindowEvent method to handle any other non-field events.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;  RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: DeferOpenReport, Next, TimeSlice, TakeRecord, WindowManager.TakeEvent, WindowManager.TakeWindowEvent

RuleManager

Overview

The Rule Manager classes work together to provide a central repository for business rules logic and a methodology for checking and responding to business rules in Clarion procedures. The Rule Manager classes also provide the option of visual indicators when a rule has been broken and conditional hiding or disabling of controls in the presence of broken rules.

Why Use RuleManager?

A primary requirement of a database system is the validation of data, or, more generally, enforcement of business rules. A common methodology is to put all validation code in the update procedure. However, the same tables may be handled by multiple procedures, *e.g.*, manual input and batch processes, and individual columns may also be updated by procedures primarily concerned with other tables.

The result is that code for validating a particular column is repeated in multiple places throughout the application, providing opportunities for inconsistency and, as the system grows, creating a maintenance nightmare.

The Rule Manager Classes and associated templates provide a mechanism for centralizing validation code so that validation, wherever it is needed, is always provided in exactly the same way by code which can be maintained in a single, central location.

In addition, the Rule Manager Classes provide facilities for identifying broken rules in a convenient manner and enforcing rules through selective disabling or hiding of controls.

RuleManager Concepts

Rule Manager is implemented by a set of three classes:

- The **Rule** CLASS stores the definition of, and provides a method for testing, a single rule.
- The **RulesCollection** CLASS manages a collection of related rules, and provides methods for defining those rules, testing them singly or jointly, counting and/or displaying broken rules, and hiding or disabling controls when one or more rules is broken.
- The **RulesManager** CLASS manages multiple instances of RulesCollection.

These objects work together to implement Rule Manager features.

A Collection Class of Rules

A RulesCollection object is a collection class that is composed of an indefinite number of Rule objects. Each Rule object contains a single expression which when evaluated indicates whether the rule is broken or not. Rules can be explicitly checked by name, numeric id or all at once.

Visual Indicators

Each Rule object within the RulesCollection object has the option of displaying a small button with an image next to a specified control when the rule has been checked and found to be broken.

Evaluation of rules

When a rule is checked, the EVALUATE() function is called internally by the RuleUsBroken() method. Therefore all variables used by a BrokenRulesManager object need to be explicitly bound. If the result of the EVALUATE() returns FALSE, it means that the rule has been broken.

Responding to Broken Rules

RulesCollection provides the ability to keep a tally or how many rules are broken at one time. It does not explicitly re-check all the rules, but rather counts all the rules that have already been flagged as broken. This will provide you with a single, clean reference for determining whether a procedure is in a valid state or not.

Rule Manager Relationship to Other Application Builder Classes

The Rule Manager Classes work in conjunction with the WindowManager Class to provide visual error indicators. Template-placed code allows Rule Manager to work within the ACCEPT loop of WindowManager to handle events related to error indicators.

RuleManager ABC Template Implementation

Three templates support the use of the Rule Manager classes. They are:

- The **Global Business Rules Manager**, which establishes logical connections between business rules and particular table columns, other fields, and controls.
- The **Local Business Rules Manager**, which implements global rules wherever relevant items are populated and allows for the addition of local rules having effect in only one procedure. The Local Business Rules Manager is automatically added to every procedure in any application which contains the Global Business Rules Manager.
- A code template, the **Error Handler for Business Rules**, which provides enhanced functionality where needed.

RuleManager Source Files

The Rule Manager Classes source code is installed by default to the Clarion \LIBSRC folder. The Rule Manager source code and its respective components are contained in:

ABRULE.INC	Rule Manager Class declarations
ABRULE.CLW	Rule Manager Class method definitions

RuleManager Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use and terminate a RulesCollection and related Rule objects in a standard ABC Window procedure. This example defines several rules and checks them at critical points. Each rule is bound to a specific control (this is optional) and when the rule is checked and found to be broken, a graphic error indicator is displayed next to the associated control. The OK button is disabled when there are broken rules.

```
 MEMBER('app.clw')              ! This is a MEMBER module

INCLUDE('ABRULES.INC'),ONCE

INCLUDE('ABTOOLBA.INC'),ONCE
INCLUDE('ABWINDOW.INC'),ONCE

MAP
 INCLUDE('APP001.INC'),ONCE     !Local module procedure declarations
```

```
  END


Main PROCEDURE                    !Generated from procedure template - Window

CusName              STRING(20)
CusAddress           STRING(20)
CusPhone             STRING(10)
CustomerRules &RuleManager        !Rule manager for Rules for the customer
Window WINDOW('Example of using RulesManager'),AT(,,169,124), FONT(,,,,CHARSET:ANSI),|
       GRAY,DOUBLE
        SHEET,AT(3,4,159,116),USE(?Sheet1)
         TAB('Customer Info'),USE(?Tab1)
          SHEET,AT(8,26,149,62),USE(?Sheet2)
           TAB('Name'),USE(?Tab3)
            ENTRY(@s20),AT(51,55,60,10),USE(CusName),IMM
            PROMPT('Cus Name:'),AT(13,55),USE(?CusName:Prompt)
           END
           TAB('Address'),USE(?Tab4)
            PROMPT('Cus Address:'),AT(12,53),USE(?CusAddress:Prompt)
            ENTRY(@s20),AT(69,53,60,10),USE(CusAddress),IMM
           END
           TAB('Phone'),USE(?Tab5)
            PROMPT('Cus Phone:'),AT(12,52),USE(?CusPhone:Prompt)
            ENTRY(@s10),AT(69,50,60,10),USE(CusPhone),IMM
           END
          END
     BUTTON('OK'),AT(118,96,32,14),USE(?Button:OK),STD(STD:Close)
     BUTTON('View Customer Broken Rules'),AT(8,95,101,14),USE(?Button:ListAll)
        END
       END
      END

ThisWindow           CLASS(WindowManager)
Init                   PROCEDURE(),BYTE,PROC,DERIVED
Kill                   PROCEDURE(),BYTE,PROC,DERIVED
TakeAccepted           PROCEDURE(),BYTE,PROC,DERIVED
TakeFieldEvent         PROCEDURE(),BYTE,PROC,DERIVED
TakeNewSelection       PROCEDURE(),BYTE,PROC,DERIVED
                     END

Toolbar              ToolbarClass

  CODE
  GlobalResponse = ThisWindow.Run()


ThisWindow.Init PROCEDURE

ReturnValue          BYTE,AUTO

  CODE
  GlobalErrors.SetProcedureName('Main')
```

```
  SELF.Request = GlobalRequest
  ReturnValue = PARENT.Init()

  !Bind the variables used by RulesManager
  BIND('CusName',CusName)                              !RulesManager Hotfield
  BIND('CusAddress',CusAddress)                        !RulesManager Hotfield
  BIND('CusPhone',CusPhone)                            !RulesManager Hotfield

  !Define RulesManager
  CustomerRules &= New(RuleManager)
  CustomerRules.SetErrorImage('~SMCROSS.ICO')
  CustomerRules.SetDescription('Rules for the customer')

!Defining rules in RulesManager
CustomerRules.AddRule|
('CusNameReq','Customer name is required','len(clip(CusName))>0',?CusName,3)
  CustomerRules.AddRule|
('Addreq','Customer address is required','len(Clip(CusAddress))',?CusAddress,3)
CustomerRules.AddRule('PhoneReq','Phone is required','Len(Clip(CusPhone))>0',?CusPhone,3)

  IF ReturnValue THEN RETURN ReturnValue.
  SELF.FirstField = ?CusName
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  SELF.AddItem(Toolbar)
  CLEAR(GlobalRequest)
  CLEAR(GlobalResponse)
  OPEN(Window)
  SELF.Opened=True
  !Check all Rules in RulesManager and show error indicators
  CustomerRules.CheckAllRules(1)

  SELF.SetAlerts()
  RETURN ReturnValue


ThisWindow.Kill PROCEDURE

ReturnValue          BYTE,AUTO

  CODE
  ReturnValue = PARENT.Kill()
  IF ReturnValue THEN RETURN ReturnValue.
  GlobalErrors.SetProcedureName

  !UnBind the variables used by RulesManager
  UNBIND('CusName')                                    !RulesManager Hotfield
  UNBIND('CusAddress')                                 !RulesManager Hotfield
  UNBIND('CusPhone')                                   !RulesManager Hotfield
  Dispose(CustomerRules)

  RETURN ReturnValue
```

```
ThisWindow.TakeAccepted PROCEDURE

ReturnValue          BYTE,AUTO

Looped BYTE
  CODE
  !Pass the Accepted control to RulesManager for processing in case
  !the control clicked was an error indicator. If it was an error indicator,
  !a MessageBox containing the description of the broken rule will be displayed
  CustomerRules.TakeAccepted(Accepted())
  LOOP
    IF Looped
      RETURN Level:Notify
    ELSE
      Looped = 1
    END
  ReturnValue = PARENT.TakeAccepted()
    CASE ACCEPTED()

    OF ?Button:ListAll
     ThisWindow.Update

!This will Cause a window to popup that contains a list of all broken rules,
!and if the user double clicked one of the rules in the list, the relevant
!control will be selected.

 Select(CustomerRules.EnumerateBrokenRules|
 (CustomerRules.GetDescription(),CustomerRules.GetErrorImage()))

    END
    RETURN ReturnValue
  END
  ReturnValue = Level:Fatal
  RETURN ReturnValue

ThisWindow.TakeFieldEvent PROCEDURE

ReturnValue          BYTE,AUTO

Looped BYTE
  CODE
  LOOP
    IF Looped
      RETURN Level:Notify
    ELSE
      Looped = 1
    END

    !Disable the save button if there are any broken rules
    ?Button:OK{Prop:Disable} = CustomerRules.BrokenRuleCount()

    !Hide the ListAll button if there are no broken rules
```

```
    ?Button:ListAll{Prop:Hide} = Choose(CustomerRules.BrokenRuleCount() = 0)

    ReturnValue = PARENT.TakeFieldEvent()
    RETURN ReturnValue
  END
  ReturnValue = Level:Fatal
  RETURN ReturnValue


ThisWindow.TakeNewSelection PROCEDURE

ReturnValue          BYTE,AUTO

Looped BYTE
  CODE
  LOOP
    IF Looped
      RETURN Level:Notify
    ELSE
      Looped = 1
    END
    ReturnValue = PARENT.TakeNewSelection()
  CASE FIELD()

  OF ?CusName
  UPDATE
  CustomerRules.CheckRule('CusNameReq',1)!Check for broken rule in RulesManager

  OF ?CusAddress
  UPDATE
  CustomerRules.CheckRule('AddReq',1) !Checking for broken rule in RulesManager

  OF ?CusPhone
  UPDATE
 CustomerRules.CheckRule('PhoneReq',1)!Checking for broken rule in RulesManager

    END
    RETURN ReturnValue
  END
  ReturnValue = Level:Fatal
  RETURN ReturnValue
```

Implementation Steps using hand code

Although there is a powerful template that is included with Clarion to help you implement the RuleManager, there are times when you may need to hand code its properties and methods into your source. The following are the recommend steps to implementing the RuleManager in your hand coded projects.

1. Identify specific rules and assign each rule a name. For example, if *Cus:Name* is required, call it *CusNameReq*.

2. For each rule, write a line of code that returns the value of TRUE when the rule is unbroken. For example, if *Cus:Name* is required, the corresponding code will be:

```
Len(Clip(Cus:Name)) > 0
```

   If *Cus:Address* is required if *Cus:Name* <> "Unknown", the corresponding code will be

```
Choose(Upper(Clip(Cus:Name))<<>''UNKNOWN'' and len(Clip(Cus:Address))=0,0,1)
```

3. Bind all of the variables used in each expression.

```
BIND('Cus:Name',Cus:Name)

BIND('Cus:Address',Cus:Address)
```

4. Define a RuleManager Object.

```
CustomerRules &RuleManager
```

5. Instantiate the RuleManager Object

```
CustomerRules &= New(RuleManager)
CustomerRules.SetErrorImage('~SMCROSS.ICO')
CustomerRules.SetDescription('Rules for the customer')
```

6. Define the rules for the RulesManager

```
CustomerRules.AddRule('CusNameReq','Customer name is required' ,|
     'len(clip(CusName))>0',?CusName,3)

!A small button with the icon SMCROSS.ICO' will be displayed 3
pixels to the left of !?CusName when the expression evaluates to
false

CustomerRules.AddRule|
('Addreq','Customer address is required if customer name is not
"Unknown"',|
'Choose(Upper(Clip(CusName))<<>''UNKNOWN'' and |
```

```
len(Clip(CusAddress))=0,0,1)',?CusAddress,3)
!A small button with the icon SMCROSS.ICO' will be displayed 3 pixels to
the left of !?CusAddress when the expression evaluates to false
```

7. Check the rules.

```
      CustomerRules.CheckAllRules(1)            !Checks all the
rules
      CustomerRules.CheckRule('CusNameReq',1) !Checks specific rule
```

8. Trap a mouse click on the error indicator button.

```
      CustomerRules.TakeAccepted(Accepted())

      !If a description is provided with the corresponding error, a
      !message with the corresponding error will appear
```

9. Count the Broken Rules.

```
      ?OK{Prop:Disable} = CustomerRules.BrokenRuleCount()
      !The ?OK button is disabled when there are broken rules
```

10. View All Broken Rules.

```
Select(CustomerRules.EnumerateBrokenRules|

(CustomerRules.GetDescription(),CustomerRules.GetErrorImage()))

!Call a popup listbox of broken rules, and use the default RulesManager
icon as an icon. !If the user double clicks one of the broken rules, the
corresponding control will be !selected.
```

Rule Class Properties

The Rule Class contains no public properties.

Rule Class Methods

Access Methods

Although all of the properties of the Rule class are PRIVATE, public access to these properties is provided by a set of methods:

GetName( ) returns a STRING containing the Name property.

GetExpression( ) returns a STRING containing the Expression property.

GetControlNum( ) returns a LONG containing the ControlNum Property

GetDescription( ) returns a STRING containing the Description property

GetErrorIndicator( ) returns a LONG containing the ErrorIndicator property

GetErrorImage( ) returns a STRING containing the ErrorImage property

GetIsBroken( ) returns a LONG containing the IsBroken property

GetOffsetRight( ) returns a LONG containing the OffsetRight property

SetName(string **)** sets the Name property

SetExpression(string) sets the Expression property

SetControlNum(value) sets the ControlNum property

SetDescription(string) sets the Description property

SetErrorIndicator(value **)** sets the ErrorIndicator property

SetErrorImage(string **)** sets the ErrorImage property

SetIsBroken(value **)** sets the IsBroken property

SetOffsetRight(value) sets the OffestRight property

Setxxx**/Get**xxx	Sets or retrieves a property
string	A string constant, variable, EQUATE, or expression that contains a value appropriate to the property being set.
value	A LONG constant, variable, EQUATE, or expression that contains a value appropriate to the property being set.

Example:

```
RulesCollection.AddRule PROCEDURE(STRING RuleName,STRING RuleDescription,|
                                  STRING RuleExpression,<LONG ControlNum>,|
                                  LONG OSR=3)
Counter     LONG
Found       BYTE
    CODE
    SELF.BrokenRuleQueue.BrokenRuleInstance &= NEW(Rule)
    SELF.BrokenRuleQueue.BrokenRuleInstance.SetName(RuleName)
    SELF.BrokenRuleQueue.BrokenRuleInstance.SetExpression(RuleExpression)
    SELF.BrokenRuleQueue.BrokenRuleInstance.SetDescription(RuleDescription)
    SELF.BrokenRuleQueue.BrokenRuleInstance.SetErrorImage(SELF.ErrorImage)
    IF ~OMITTED(5)
      SELF.BrokenRuleQueue.BrokenRuleInstance.SetControlNum(ControlNum)
      SELF.BrokenRuleQueue.BrokenRuleInstance.SetErrorIndicator(ControlNum+1000)
      SELF.BrokenRuleQueue.BrokenRuleInstance.SetOffsetRight(OSR)
    END
    ADD(SELF.BrokenRuleQueue)
```

SetGlobalRule (post address to GlobalRule)

SetGlobalRule

SetGlobalRule Posts address of current Rule object to SELF.GlobalRule.

The **SetGlobalRule** method tests the GlobalRule reference property for NULL. If the reference is not NULL, the address of the current instance of Rule (ADDRESS(SELF)) is posted to the referenced variable.

Example:

```
Rule.RuleIsBroken PROCEDURE(Byte DisplayIndicator)
RetVal              LONG
EvaluateResults byte
    CODE
    SELF.SetGlobalRule
    EvaluateResults = EVALUATE(SELF.Expression)
    IF INLIST(ERRORCODE(),800,810,1011)
       RetVal = ERRORCODE()
       STOP('Evaluate Syntax error’)
    ELSE
       RetVal = CHOOSE(EvaluateResults = 0,1,0)
       SELF.SetIsBroken(RetVal)
       IF DisplayIndicator
          SELF.SetIndicator(RetVal)
       END
    END
    SELF.ResetGlobalRule
    RETURN(RetVal)
```

See Also: ResetGlobalRule, RuleIsBroken

ResetGlobalRule (clear address in GlobalRule)

ResetGlobalRule

ResetGlobalRule Sets SELF.GlobalRule to zero.

The **ResetGlobalRule** method tests the GlobalRule reference property for NULL. If the reference is not NULL, a zero is posted to the referenced variable.

Example:

```
Rule.RuleIsBroken PROCEDURE(Byte DisplayIndicator)
RetVal              LONG
EvaluateResults byte
    CODE
    SELF.SetGlobalRule
    EvaluateResults = EVALUATE(SELF.Expression)
    IF INLIST(ERRORCODE(),800,810,1011)
       RetVal = ERRORCODE()
       STOP('Evaluate Syntax error’)
    ELSE
       RetVal = CHOOSE(EvaluateResults = 0,1,0)
       SELF.SetIsBroken(RetVal)
       IF DisplayIndicator
          SELF.SetIndicator(RetVal)
       END
    END
    SELF.ResetGlobalRule
    RETURN(RetVal)
```

See Also: RuleIsBroken

RuleIsBroken (test rule and return result)

RuleIsBroken(*display* **)**

RuleIsBroken	Tests the rule and returns the result
display	An integer constant, variable, EQUATE, or expression that indicates whether to display an error indicator if the rule is broken.

The **RuleIsBroken** method uses EVALUATE to test SELF.Expression. If the result is zero, the rule is considered broken. Otherwise, the rule is considered sound. The method returns True if the rule is broken, False if not. If the value of *display* is non-zero, an error indicator is set using the SetIndicator method.

Implementation: The RuleIsBroken method relies on the EVALUATE function to test a string containing an expression. Accordingly, all names used in the expression must be bound. If a procedure name is used, it must return a STRING, REAL or LONG value. If the procedures accept parameters, those paramaters must be STRINGs passed by value and may not be omittable.

The RuleIsBroken method tests explicitly for errors related to the EVALUATE process and ignores errors which might be posted by called procedures. These procedures must therefore handle any errors which may be posted during their execution.

The RuleIsBroken method calls SELF.SetGlobalRule before evaluating the expression and SELF.ResetGlobalRule immediately after evaluating the expression. During the EVALUATE process, then, a called procedure can use the address posted to call back to the current Rule instance.

Return Data Type: BYTE

Example:

```
RulesCollection.CheckAllRules Procedure(<BYTE DisplayIndicator>)
RetVal          LONG
LBR             &Rule
Counter         LONG
Recs            LONG
lIsBroken       BYTE
    CODE
    Recs    = SELF.RuleCount()
    Retval  = 0
    LOOP Counter = 1 TO Recs
       LBR    &= SELF.Item(Counter)
       lIsBroken= LBR.RuleIsBroken(DisplayIndicator)
       RetVal +=lIsBroken
    END
    IF SELF.ChangeControlsStatus
       SELF.SetControlsStatus()
    END
    RETURN(RetVal)
```

See Also: SetGlobalRule, ResetGlobalRule, SetIndicator

SetIndicator (set error indicator)

SetIndicator(*broken* **)**

The **SetIndicator** method creates or destroys an error indicator as appropriate.

broken An integer constant, variable, EQUATE, or expression that indicates whether the current rule is broken.

Implementation: The SetIndicator method destroys any previously created error indicator for this rule and conditionally creates a new one.

Example:

```
RetVal = CHOOSE(EvaluateResults = 0,1,0)
SELF.SetIsBroken(RetVal)
IF DisplayIndicator
   SELF.SetIndicator(RetVal)
END
```

RulesCollection Class Properties

The RulesCollection Class contains no public properties.

RulesCollection Class Methods

Access Methods

Although all of the properties of the RulesCollection class are PRIVATE, public access to these properties is provided by a set of methods:

GetDescription() returns a STRING containing the Description property

GetErrorImage() returns a STRING containing the ErrorImage property

GetChangeControls() returns a BYTE containing the ChangeControlsStatus property

SetDescription(string) sets the Description property

SetErrorImage(string **)** sets the ErrorImage property

SetChangeControls(status **)** sets the ChangeControlsStatus property

Setxxx**/Get**xxx	Sets or retrieves a property
string	A string constant, variable, EQUATE, or expression that contains a value appropriate to the property being set.
status	A Boolean constant, variable, EQUATE, or expression that contains either True or False.

Example:

```
Customer.SetErrorImage('~BRuleNo.ico')
Customer.SetDescription('Customer File Rules')
Customer.AddRule('ShortNameRequired','Short name is required', |
                 'cus:ShortName <<> '''' OR CheckShortName()'  |
                 ,?cus:ShortName,3)
```

Construct (initialize RulesCollection object)

Construct

Construct Initializes the RulesCollection object. The Construct method is executed automatically when the object is instantiated.

Destruct (shut down RulesCollection object)

Destruct

Destruct Performs necessary cleanup prior to the disposal of the RulesCollection object. The Destruct method is executed automatically when the object is disposed of.

RuleCount (count rules in the collection)

RuleCount()

RuleCount Returns the number of rules being monitored by this RulesCollection object.

Return Data Type: LONG

Example:

```
NumberOfRules = SELF.RuleCount()
```

BrokenRuleCount (count rules in the collection which are broken)

BrokenRuleCount()

BrokenRuleCount Returns the number of rules being monitored by this RulesCollection object that are broken.

Return Data Type: LONG

Example:

```
CustomerRules RulesCollection
CODE
... code omitted ...
BrokenRules = CustomerRules.BrokenRuleCount()
```

AddRule (add a rule to this collection)

AddRule(*name*,*description*,*expression*,*control*,*offset***)**

AddRule	Adds and initializes a rule to the collection being managed by this RuleManager object
name	A string constant, variable, EQUATE, or expression that contains a name for this rule. If this name is not unique, results may be unpredictable.
description	A string constant, variable, EQUATE, or expression that contains a description of this rule. The primary use of this description is as a message identifying a broken rule. The description should be worded with this use in mind.
expression	A string constant, variable, EQUATE, or expression that contains the logical expression which defines this rule. If the expression evaluates to False, the rule is considered broken.
control	A numeric constant, variable, EQUATE, or expression that specifies the Field Equate of the control linked to this rule. If the rule is broken, an error indicator will be placed to the right of this control.
offset	A numeric constant, variable, EQUATE, or expression that specifies the distance, in dialog units, between the right side of the linked control and the error indicator.

The **AddRule** method creates a Rule object and adds it to the broken rule queue.

Example:

```
Customer RulesCollection
  CODE
  Customer.SetErrorImage('~BRuleNo.ico')
  Customer.SetDescription('Customer File Rules')
  Customer.AddRule('ShortNameReqiored','Short name is required', |
                   'cus:ShortName <<> '''' OR CheckShortName()', |
                    ?cus:ShortName,3)
  Customer.AddRule('Company Boolean','Must select individual (0) or company (1)', |
                    'INRANGE(cus:Company,0,1)',?cus:Company,3)
  Customer.AddRule('CompanyNameRequired','Company name is required', |
                   'cus:CompanyName <<> '''' OR NOT cus:Company',?cus:CompanyName,3)
  Customer.AddRule('LastNameRequired','Last name is required', |
                   'cus:LastName <<> '''' OR cus:Company',?cus:LastName,3)
  Customer.AddRule('CityRequired','City is required','cus:City <<> '''''',?cus:City,3)
  Customer.AddRule('StateRequired','State is required','cus:State <<> '''''',?cus:State,
  Customer.AddRule('ZipOK','Postal code must have valid format.',
                   'CheckCustomerZip()',?cus:ZipCode,3)
  Customer.AddRule('CreditLimit','Credit limit must not exceed $1000.00',
                   'cus:CreditLimit =<< 1000',?cus:CreditLimit,3)
```

AddControl (add managed control)

AddControl(*feq*,*action* **)**

AddControl Adds a control to the controls queue so that a specified action is taken when any rule in the managed collection is broken.

feq A numeric constant, variable, EQUATE, or expression that indicates the Field Equate number of a control whose hidden or disabled status will be determined by the existence of one or more broken rules.

action A numeric constant, variable, EQUATE, or expression that indicates the action to be taken with respect to this control when a rule is broken, defined as follows:

RuleAction:None	EQUATE(0)
RuleAction:Hide	EQUATE(1)
RuleAction:UnHide	EQUATE(2)
RuleAction:Disable	EQUATE(3)
RuleAction:Enable	EQUATE(4)

Example:

```
Customer.SetErrorImage('~BRuleNo.ico')
Customer.SetDescription('Customer File Rules')
Customer.AddRule('StateRequired','State is required','cus:State <<> '''',?cus:State,
Customer.AddRule('ZipOK','Postal code must have valid format.',
                 'CheckCustomerZip()',?cus:ZipCode,3)
Customer.AddRule('CreditLimit','Credit limit must not exceed $1000.00',
                 'cus:CreditLimit =<< 1000',?cus:CreditLimit,3)
Customer.AddControl(?Ok,RuleAction:Disable) ! Disable OK button if any rule broken
```

AddControlToRule (add managed control)

AddControlToRule(*rule*,*feq*,*action* **)**

AddControlToRule Adds a control to the controls queue so that a specified action is taken when a particular rule in the managed collection is broken.

rule A string constant, variable, EQUATE, or expression that contains the name of this rule. If rule names are not unique within the collection managed by this RuleManager object, results may be unpredictable.

feq A numeric constant, variable, EQUATE, or expression that indicates the Field Equate number of a control whose hidden or disabled status will be determined by the status of this rule.

action A numeric constant, variable, EQUATE, or expression that indicates the action to be taken with respect to this control when a rule is broken, defined as follows:

RuleAction:None	EQUATE(0)
RuleAction:Hide	EQUATE(1)
RuleAction:UnHide	EQUATE(2)
RuleAction:Disable	EQUATE(3)
RuleAction:Enable	EQUATE(4)

Example:

```
Customer.SetErrorImage('~BRuleNo.ico')
Customer.SetDescription('Customer File Rules')
Customer.AddRule('StateRequired','State is required','cus:State <<> '''',?cus:State,
Customer.AddRule('ZipOK','Postal code must have valid format.',
                 'CheckCustomerZip()',?cus:ZipCode,3)
Customer.AddControlToRule(‘StateRequired, ?cus:ZipCode,RuleAction:Hide)
                          ! Hide Zip Code field until state is filled in.
```

CheckRule (check a particular rule)

CheckRule(*rule*,*display***)**

CheckRule	Checks a particular rule and optionally sets the error indicator for its associated control.
rule	A string constant, variable, EQUATE, or expression that contains the name of this rule. If rule names are not unique within the collection managed by this RuleManager object, results may be unpredictable.
display	A Boolean constant, variable, EQUATE, or expression that, if True, will cause the error indicator to be set for the control associated with this rule.
Return Data Type:	BYTE

Example:

```
Customer.CheckRule(ZipOK,True) ! Validate zip code and set indicator if invalid
```

CheckAllRules (check all rules in this collection)

CheckAllRules(*display***)**

CheckAllRules	Checks all rules in the collection managed by this FileManager object and optionally sets the error indicators controls associated with those rules.
display	A Boolean constant, variable, EQUATE, or expression that, if True, will cause the error indicator to be set for the control associated with this rule.
Return Data Type:	LONG

Example:

```
Customer.CheckAllRules(False) ! Validate all fields but do not set indicators.
```

Item (locate a particular rule)

Item(| *rulename* | **)**
| *position* |

Item	Locates a specified rule and retrieves its entry from the broken rule queue. t.
rulename	A string constant, variable, EQUATE, or expression that contains the name of the rule to be located. If rule names are not unique within the collection managed by this RuleManager object, results may be unpredictable.
position	A string constant, variable, EQUATE, or expression that contains a numeric value corresponding to the position in the broken rule queue of the rule to be located.

The **Item** method locates the specified rule and returns the address of its Rule object. If the specified rule name does not exist in the broken rule queue or if the specified position is outside the range of entries in the broken rule queue, the Item method returns zero.

Return Data Type: LONG

Example:

```
RulesCollection.BrokenRuleCount PROCEDURE
LBR             &Rule
NumberOfRules   LONG
Counter         LONG
RetVal          LONG

    CODE
    NumberOfRules = SELF.RuleCount()
    LOOP Counter = 1 TO NumberOfRules
        LBR &= SELF.Item(Counter)
        IF LBR.GetIsBroken()
           Retval += 1
        END
    END
    RETURN(Retval)
```

TakeAccepted (handle acceptance of error indicators)

TakeAccepted(*control* **)**

TakeAccepted Determines whether or not the specified control is an error indicator for one of the Rule objects managed by this RulesCollection object. If so, the TakeAccepted method displays the description of the rule and provides the user with an option to view the status of all broken rules.

control A numeric constant, variable, EQUATE, or expression that contains a field equate value. The control indicated by this value is assumed to have been Accepted.

Return Data Type: BYTE

Implementation: When the control that has been accepted is an error indicator, the description of the associated rule is displayed in a message box. This message box always provides a Close button. If the total number of broken rules found exceeds one, a second button offers to display all of them. If the Supervisor property is not NULL, this RulesCollection object uses that property to access the EnumerateBrokenRules method of its supervising RulesManagerObject rather than its own. As a result, the user gets a full list of broken rules even when the controls on a screen involve rules from more than one collection.

Example:

```
ThisWindow.TakeAccepted PROCEDURE
ReturnValue          BYTE,AUTO
Looped BYTE
  CODE
  Customer.TakeAccepted(Accepted())! RulesCollection traps to determine if
                                   ! error-indicator was clicked
  LOOP
    IF Looped
      RETURN Level:Notify
    ELSE
      Looped = 1
    END
    CASE ACCEPTED()
    END
  EMD
```

See Also: CheckAllRules, EnumerateBrokenRules

SetEnumerateIcons (set icons for broken rules display)

SetEnumerateIcons(*windowicon*, *validicon*, *brokenicon***)**

SetEnumerateIcons	Sets the icons for the display produced by the EnumerateBrokenRules method.
windowicon	A string constant, variable, EQUATE, or expression that contains the file name of the icon which will appear on the title bar of the broken rules listing.
validicon	A string constant, variable, EQUATE, or expression that contains the file name of the icon which will appear on lines containing valid rules.
brokenicon	A string constant, variable, EQUATE, or expression that contains the file name of the icon which will appear on lines containing broken rules.
Return Data Type:	LONG

Example:

```
Customer. SetEnumerateIcons('~BRules.ico','~BRuleOk.ico', |
                                          '~BRuleNo.ico')
```

See Also: EnumerateBrokenRules

EnumerateBrokenRules (display a list of rules with status of each)

EnumerateBrokenRules(*header*,*brokenonly* **)**

EnumerateBrokenRules	Displays a list of the rules managed by this RulesCollection object.
header	A string constant, variable, EQUATE, or expression that contains a header to be displayed in the title bar of the enumerated rules display.
broken	A Boolean constant, variable, EQUATE, or expression that, if True, causes the EnumerateBrokenRules method to display only rules which are broken.

The **EnumerateBrokenRules** method provides a convenient way to display the set of rules (or broken rules) managed by this RulesCollection object. If the user selects a rule from this display, the field equate of the control associated with that rule is returned, allowing the appropriate field to be SELECTed,

Example:

```
IF MESSAGE(Desc,'Error Information',ICON:ASTERISK,'Close |' & MoreString) = 2
  SelectControl = SELF.EnumerateBrokenRules(SELF.GetDescription())
  IF SelectControl
    SELECT(SelectControl)
  END
END
```

See Also: TakeAccepted

SetControlsStatus (set status of managed controls)

SetControlsStatus([*control* [, *action*]] **)**

SetControlsStatus Sets the hidden or disabled status of a control or controls managed by this RulesCollection object.

action A numeric constant, variable, EQUATE, or expression that indicates the action to be taken with respect to this control when a rule is broken, defined as follows:

RuleAction:None	EQUATE(0)
RuleAction:Hide	EQUATE(1)
RuleAction:UnHide	EQUATE(2)
RuleAction:Disable	EQUATE(3)
RuleAction:Enable	EQUATE(4)

control A numeric constant, variable, EQUATE, or expression that contains a field equate value.

The **SetControlsStatus** method sets the status of controls managed by this RulesCollection object depending on the parameters supplied. If *control* is supplied, only status changes involving that control are processed. If *action* is supplied, only status changes involving that action are processed. If neither is supplied, then all changes for all controls are processed.

Example:

```
RulesCollection.SetControlsStatus PROCEDURE
lIndex  LONG
lIndex2 LONG
lChange BYTE
   CODE
   LOOP lIndex=1 TO RECORDS(SELF.Controls)
     GET(SELF.Controls,lIndex)
     IF ERRORCODE() THEN BREAK.
     SELF.SetControlsStatus(SELF.Controls.Control,pAction)
   END
```

NeedChangeControlStatus (check if control status needs to change)

NeedChangeControlStatus(*control*, *action*, *found* **)**

NeedChangeControlStatus Examines the conditions under which the hidden or disabled status of control needs to change and returns information about whether the change is needed now.

control A numeric constant, variable, EQUATE, or expression that contains a field equate value.

action A numeric constant, variable, EQUATE, or expression that indicates the action to be taken with respect to this control when a rule is broken, defined as follows:

RuleAction:None	EQUATE(0)
RuleAction:Hide	EQUATE(1)
RuleAction:UnHide	EQUATE(2)
RuleAction:Disable	EQUATE(3)
RuleAction:Enable	EQUATE(4)

found A numeric variable which will be updated with an action code.

The **NeedChangeControlStatus** method returns True if the status of *control* needs to change, False if not. On return, the *found* variable is set to the action that needs to be taken.

Example:

```
lActionExist = RuleAction:None
lChange = SELF.NeedChangeControlStatus(pControlFeq,pAction,lActionExist)
     IF lActionExist<>pAction THEN RETURN.
```

RulesManager Properties

The RulesManager Class contains no public properties.

RulesManager Methods

Access Methods

Although most of the properties of the RulesCollection class are PRIVATE, public access to these properties is provided by a set of methods:

GetChangeControls() returns a BYTE containing the ChangeControlsStatus property

SetChangeControls(*status* **)** sets the ChangeControlsStatus property

---

Setxxx**/Get**xxx Sets or retrieves a property

status A Boolean constant, variable, EQUATE, or expression that contains either True or False.

Example:

```
RulesManager.AddRulesCollection PROCEDURE(RulesCollection pRM)
    CODE
    SELF.Rules.RM &= pRM
    ADD(SELF.Rules)
    SELF.Rules.RM.ChangeControlsStatus = False
```

Construct (initialize RulesManager object)

Construct

Construct Initializes the RulesManager object. The Construct method is executed automatically when the object is instantiated.

Destruct (shut down RulesManager object)

Destruct

Destruct Performs necessary cleanup prior to the disposal of the RulesManager object. The Destruct method is executed automatically when the object is disposed of.

RulesManagerCount (count rules in the collection)

RulesManagerCount()

RuleManagerCount Returns the number of RulesCollection objects being monitored by this RulesCollection object.

Return Data Type: LONG

Example:

```
NumberOfRulesCollections = SELF.RulesManagerCount()
```

BrokenRulesCount (count rules in the collection which are broken)

BrokenRulesCount()

BrokenRulesCount Returns the number of rules being monitored, by all of the RulesCollection objects managed by this RulesManager object, which are broken.

Return Data Type: LONG

Example:

```
BrokenRules = SELF.BrokenRuleCount()
```

AddRulesCollection (add a rule to this collection)

AddRulesCollection(*RulesCollection* **)**

AddRulesCollection Adds a RulesCollection instance to the collection being managed by this RulesManager object

RulesCollection The label of a RulesCollection object.

The **AddRulesCollection** method adds the specified RulesCollection object to the RuleManager and adds it to the Rules queue.

Example:

```
BusinessRulesManager.AddRulesCollection(Customer)
BusinessRulesManager.SetEnumerateIcons('~BRules.ico','~BRuleOk.ico', |
                                       '~BRuleNo.ico')
BusinessRulesManager.AddControl(?Ok,RuleAction:Disable)
BusinessRulesManager.SetGlobalRuleReferences(GlobalRule)
```

CheckAllRules (check all rules in all collections)

CheckAllRules(*display* **)**

CheckAllRules Checks all rules in the collections (RulesCollection objects) managed by this FilesManager object, optionally sets the error indicators controls associated with those rules, and returns a count of broken rules.

display A Boolean constant, variable, EQUATE, or expression that, if True, will cause the error indicator to be set for the control associated with this rule.

Return Data Type: LONG

Example:

```
BusinessRulesManager.CheckAllRules(True) ! Validate all fields and set indicators.
```

TakeAccepted (handle acceptance of error indicators)

TakeAccepted(*control* **)**

TakeAccepted	Determines whether or not the specified control is an error indicator for one of the Rule objects monitored by RulesCollection objects which are in turn managed by this RulesManager object. If so, the TakeAccepted method displays the description of the rule and provides the user with an option to view the status of all broken rules.
control	A numeric constant, variable, EQUATE, or expression that contains a field equate value. The control indicated by this value is assumed to have been Accepted.

Return Data Type: BYTE

Example:

```
ThisWindow.TakeAccepted PROCEDURE
ReturnValue          BYTE,AUTO
Looped BYTE
  CODE
  BusinessRulesManager.TakeAccepted(Accepted())! RulesManager trap to determine
                                               ! if error-indicator was clicked
  LOOP
    IF Looped
      RETURN Level:Notify
    ELSE
      Looped = 1
    END
    CASE ACCEPTED()
    END
  EMD
```

SetEnumerateIcons (set icons for broken rules display)

SetEnumerateIcons(*windowicon*, *validicon*, *brokenicon* **)**

SetEnumerateIcons	Sets the icons for the display produced by the EnumerateBrokenRules method.
windowicon	A string constant, variable, EQUATE, or expression that contains the file name of the icon which will appear on the title bar of the broken rules listing.
validicon	A string constant, variable, EQUATE, or expression that contains the file name of the icon which will appear on lines containing valid rules.
brokenicon	A string constant, variable, EQUATE, or expression that contains the file name of the icon which will appear on lines containing broken rules.
Return Data Type:	LONG

Example:

```
BusinessRulesManager.SetEnumerateIcons('~BRules.ico','~BRuleOk.ico', |
                                       '~BRuleNo.ico')
```

See Also: EnumerateBrokenRules

EnumerateBrokenRules (display a list of rules with status of each)

EnumerateBrokenRules(*header*,*brokenonly* **)**

EnumerateBrokenRules
Displays a list of the rules monitored by RulesCollection objects which in turn are managed by this RulesManager object.

header A string constant, variable, EQUATE, or expression that contains a header to be displayed in the title bar of the enumerated rules display.

broken A Boolean constant, variable, EQUATE, or expression that, if True, causes the EnumerateBrokenRules method to display only rules which are broken.

The **EnumerateBrokenRules** method provides a convenient way to display the set of rules (or broken rules) monitored by RulesCollection objects managed by this RulesManager object. If the user selects a rule from this display, the field equate of the control associated with that rule is returned, allowing the appropriate field to be SELECTed,

Example:

```
IF MESSAGE(Desc,'Error Information',ICON:ASTERISK,'Close |' & MoreString) = 2
  SelectControl = SELF.EnumerateBrokenRules(SELF.GetDescription(), |
                                            SELF.GetErrorImage())
  IF SelectControl
    SELECT(SelectControl)
  END
END
```

See Also: TakeAccepted

SetControlsStatus (set status of managed controls)

SetControlsStatus( )

SetControlsStatus

Sets the hidden or disabled status of a control or controls managed by this RulesManager object and by RulesCollection objects assigned to this RulesManager object.

The **SetControlsStatus** method sets the status of controls managed by this RulesManager object and subsidiary RulesCollection objects.

SelectFileClass

SelectFileClass Concepts

The SelectFileClass object manages the Windows File Dialog--both 16-bit (short filenames) and 32-bit versions (long filenames)--to select a single file or multiple files.

SelectFileClass Relationship to Other Application Builder Classes

The ASCIIViewerClass uses the the SelectFileClass to let the end user choose the file to view. Otherwise, the SelectFileClass is completely independent of other Application Builder Classes.

SelectFileClass ABC Template Implementation

The ABC DOSFileLookup control template generates code to declare a local SelectFileClass class *and* object for each instance of the SelectFile Control Template.

The class is named SelectFile# where # is the instance number of the DOSFileLookup control template. The template provides the derived class so you can use the **Classes** tab to easily modify the select file behavior on an instance-by-instance basis.

SelectFileClass Source Files

The SelectFileClass source code is installed by default to the Clarion \LIBSRC folder. The SelectFileClass source code and its respective components are contained in:

ABUTIL.INC	SelectFileClass declarations
ABUTIL.CLW	SelectFileClass method definitions
ABUTIL.TRN	SelectFileClass default text, mask, flags

SelectFileClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a SelectFileClass object. This example displays a dialog that alternatively allows single file or multi-file selection.

```
  PROGRAM
  INCLUDE('ABUTIL.INC')            !declare SelectFileClass
  MAP
  END
SelectFile   SelectFileClass       !declare SelectFile object
FileQ      SelectFileQueue         !declare FileName QUEUE
FileQCount   USHORT,AUTO           !declare Q counter
FileNames    CSTRING(255)          !variable to hold file names
FileMask    CSTRING('Text *.txt|*.txt|All *.*|*.*') !File dialog file masks
MultiFiles   BYTE                  !single/multiple file switch
GetFile  WINDOW('Select File'),AT(,,173,40),SYSTEM,GRAY,RESIZE
          ENTRY(@s254),AT(6,6,144,12),USE(FileNames)
          BUTTON('...'),AT(156,6,12,12),USE(?SelectFiles)
          OPTION,AT(6,20,),USE(MultiFiles)
           RADIO('One File'),AT(5,25),USE(?1File),VALUE('0')
           RADIO('Multiple Files'),AT(45,25),USE(?MultiFile),VALUE('1')
          END
          BUTTON('Close'),AT(119,24),USE(?Close)
         END
 CODE
 OPEN(GetFile)
 ACCEPT
    IF EVENT() = EVENT:OpenWindow       !on open window
   SelectFile.Init                                !initialize SelectFile object
   SelectFile.AddMask('Clarion source|*.clw;*.inc') !set default file mask
   SelectFile.AddMask(FileMask)                   !set additional file masks
  END
```

```
  CASE FIELD()
  OF ?SelectFiles                                    !on get file button
   IF EVENT() = EVENT:Accepted                       !if user clicked it
    IF MultiFiles                                    !if multiple files requested
     SelectFile.WindowTitle='Select multiple files' !set file dialog titlebar
     SelectFile.Ask(FileQ,0)                         !display file dialog
     LOOP FileQCount=1 TO RECORDS(FileQ)             !for each selected file
      GET(FileQ,FileQCount)                          !get the file information
      MESSAGE(FileQ.Name)                            !process the file
     END
    ELSE                                             !if single file requested
     SelectFile.WindowTitle = 'Select one file'      !set file dialog titlebar
     FileNames = SelectFile.Ask(1)                   !display file dialog
     DISPLAY(?FileNames)                             !redraw Filenames field
    END
   END
  OF ?Close                                          !on close button
      IF EVENT() = EVENT:Accepted                    !if user clicked it
        POST(Event:CloseWindow)                      !shut down
      END
  END
END
```

SelectFileClass Properties

The SelectFileClass contains the following properties.

DefaultDirectory (initial path)

DefaultDirectory **CSTRING(File:MaxFilePath)**

The **DefaultDirectory** property contains the directory the Windows file dialog initially opens to. If DefaultDirectory is null, the file dialog opens to the current directory.

DefaultFile (initial filename/filemask)

DefaultFile **CSTRING(File:MaxFilePath)**

The **DefaultFile** property contains the filename that initially appears in the Windows file dialog filename field. The filename may contain wildcard characters such as * to filter the file dialog's file list.

Flags (file dialog behavior)

Flags BYTE

The **Flags** property is a bitmap that indicates the type of file action the Windows file dialog performs (select, multi-select, save directory, lock directory, suppress errors). The Flags property operates identically to the FILEDIALOG *flag* parameter. See *FILEDIALOG* in the *Language Reference* for more information.

Implementation: The Init method sets the Flags property to its default value declared in ABUTIL.TRN--select a file from any directory.

See Also: Init

WindowTitle (file dialog title text)

WindowTitle CSTRING(80)

The **WindowTitle** property contains a string that sets the title bar text in the Windows file dialog.

Implementation: The Init method sets the WindowTitle property to its default value declared in ABUTIL.TRN. The SelectFileClass uses the WindowTitle property as the *title* parameter to the FILEDIALOG function. See *FILEDIALOG* in the *Language Reference* for more information.

See Also: Init

SelectFileClass Methods

AddMask (add file dialog file masks)

AddMask(| *description, masks* |**)**

| *mask string* |

AddMask	Adds file masks to the file dialog's **List Files of Type** drop-down list.
description	A string constant, variable, EQUATE, or expression that contains a file mask description such as 'all files-*.*' or 'source files-*.inc;*.clw'. The mask value may be included in the description for information only.
masks	A string constant, variable, EQUATE, or expression that defines the file mask or masks corresponding to the *description*, such as '*.*' or '*.inc;*.clw'. Multiple masks are separated by a semi-colon (;).
mask string	A string constant, variable, EQUATE, or expression that defines both the file masks and their descriptions.

The **AddMask** method adds file masks and their descriptions to the file dialog's **List Files of Type** drop-down list. The first mask is the default selection in the file dialog.

The SetMask method replaces file masks and their descriptions.

The *mask string* parameter must contain one or more descriptions followed by their corresponding file masks in the form description|masks|description|masks. All elements in the string must be delimited by the vertical bar (|). For example, **`'all files *.*|*.*|Clarion source *.clw;*.inc|*.clw;*.inc'`** defines two selections for the File Dialog's **List Files of Type** drop-down list.See the *extensions* parameter to the FILEDIALOG function in the *Language Reference* for more information.

Example:

```
FileMask CSTRING('Text *.txt|*.txt|All *.*|*.*')     !File dialog file masks
 CODE
 !program code
  IF EVENT() = EVENT:OpenWindow                       !on open window
   SelectFile.Init                                    !initialize SelectFile object
   SelectFile.SetMask('Clarion source','*.clw;*.inc')!set default file mask
   SelectFile.AddMask(FileMask)                       !set additional file masks
  END
```

See Also: SetMask

Ask (display Windows file dialog)

Ask([*file queue*] [, *restore path*] **)**

Ask	Displays the Windows file dialog.
file queue	The label of a QUEUE structure that receives information for the selected files. The structure must be the same as the SelectFileQueue structure declared in ABUTIL.INC. If omitted, the end user may select only one file, for which the Ask method returns the full pathname.
restore path	An integer constant, variable, EQUATE, or expression that indicates whether to restore the current path to its pre-file dialog state. A *restore path* value of one (1) restores the current path; a value of zero (0) does not restore the current path. If omitted, *restore path* defaults to zero (0).

The **Ask** method displays the Windows file dialog and returns information, primarily the full pathname, for the selected file or files.

Implementation: The *file queue* parameter must name a QUEUE that begins the same as the SelectFileQueue structure declared in ABUTIL.INC:

```
SelectFileQueue QUEUE,TYPE
Name             STRING(File:MaxFilePath)
ShortName        STRING(File:MaxFilePath)
                 END
```

Return Data Type: STRING

Example:

```
FileQ      SelectFileQueue              !declare FileName QUEUE
FileQCount   BYTE
 CODE
 !program code
 SelectFile.Ask(FileQ,0)                !multi file dialog, don't restore directory
 LOOP FileQCount=1 TO RECORDS(FileQ)    !for each selected file
  GET(FileQ,FileQCount)                 !get the file information
  MESSAGE(FileQ.Name)                   !process the file
 END

 FileNames = SelectFile.Ask(1)          !single file dialog, restore directory
```

Init (initialize the SelectFileClass object)

Init

The **Init** method initializes the SelectFileClass object.

Implementation: The Init method WindowTitle and Flags properties to their default values declared in ABUTIL.TRN.

Example:

```
IF EVENT() = EVENT:OpenWindow                      !on open window
 SelectFile.Init                                   !initialize SelectFile object
 SelectFile.AddMask('Clarion source|*.clw;*.inc') !set default file mask
 SelectFile.AddMask(FileMask)                      !set additional file masks
END
```

See Also: Flags, WindowTitle

SetMask (set file dialog file masks)

SetMask(| *description, masks* |**)**

| *mask string* |

SetMask	Sets the file masks available in the file dialog's **List Files of Type** drop-down list.
description	A string constant, variable, EQUATE, or expression that contains a file mask description such as 'all files-*.*' or 'source files-*.inc;*.clw'. The mask value may be included in the description for information only.
masks	A string constant, variable, EQUATE, or expression that defines the file mask or masks corresponding to the *description*, such as '*.*' or '*.inc;*.clw'. Multiple masks are separated by a semi-colon (;).
mask string	A string constant, variable, EQUATE, or expression that defines both the file masks and their descriptions.

The **SetMask** method sets the file masks and their descriptions available in the file dialog's **List Files of Type** drop-down list. The first mask is the default selection in the file dialog.

The AddMask method appends file masks and their descriptions.

The *mask string* parameter must contain one or more descriptions followed by their corresponding file masks in the form description|masks|description|masks. All elements in the string must be delimited by the vertical bar (|). For example, **`'all files *.*|*.*|Clarion source *.clw;*.inc|*.clw;*.inc'`** defines two selections for the File Dialog's **List Files of Type** drop-down list.See the *extensions* parameter to the FILEDIALOG function in the *Language Reference* for more information.

Example:

```
FileMask CSTRING('Text *.txt|*.txt|All *.*|*.*')     !File dialog file masks
 CODE
 !program code
  IF EVENT() = EVENT:OpenWindow                       !on open window
   SelectFile.Init                                    !initialize SelectFile object
   SelectFile.SetMask('Clarion source','*.clw;*.inc')!set default file mask
   SelectFile.AddMask(FileMask)                       !set additional file masks
  END
```

See Also: AddMask

StandardBehavior Class

StandardBehavior Overview

The StandardBehavior class provides a central point for specification of standard basic browse behavior.

StandardBehavior Class Concepts

The StandardBehavior class provides a set of standard methods that can be used for all classes that will emulate a browse box.

Relationship to Other Application Builder Classes

The StandardBehavior class implements the IListControl interface and the BrowseQueue interface.

StandardBehavior Source Files

The StandardBehavior source code is installed by default to the Clarion \LIBSRC folder. The specific StandardBehavior source code and their respective components are contained in:

ABBROWSE.INC	StandardBehavior declarations
ABBROWSE.CLW	StandardBehavior method definitions

StandardBehavior Properties

The StandardBehavior class contains no public properties.

StandardBehavior Methods

StandardBehavior Methods

The StandardBehavior class inherits all of the methods from the BrowseQueue and IListControl interfaces which it implements. See BrowseQueue and IListControl interfaces for more information.

Init(initialize the StandardBehavior object)

Init(***listqueue*, *viewposition*, *listcontrol***)

Init	**Initializes the StandardBehavior object.**
listqueue	The label of the list control's data source QUEUE.
viewposition	The label of a string field within the *listqueue* containing the POSITION of the *VIEW*.
listcontrol	A numeric constant, variable, EQUATE, or expression containing the control number of the browse's LIST control.

The **Init** method initializes the StandardBehavior object.

Implementation: The Init method is called by the BrowseClass.Init method. The BrowseClass.Init method creates an instance of the StandardBehavior object before the Init method is called.

See Also: BrowseClass.Init

StandardErrorLogClass

StandardErrorLogClass Overview

The StandardErrorLogClass manages the opening and closing of an error log file. This class implements the ErrorLogInterface.

StandardErrorLogClass Source Files

The StandardErrorLogClass source code is installed by default to the Clarion \LIBSRC. The specific StandardErrorLogClass source code and their respective components are contained in:

ABERROR.INC	StandardErrorLogClass declarations
ABERROR.CLW	StandardErrorLogClass method definitions

ABC Template Implementation

The StandardErrorLogClass is instantiated in the ErrorClass.Init method.

StandardErrorLogClass Properties

The StandardErrorLogClass contains no public properties.

StandardErrorLogClass Methods

Close (close standarderrorlog file)

Close(*force*), PROC, PROTECTED

Close	Close the ErrorlogFile.
force	An numeric constant, variable, EQUATE, or expression that indicates whether the log file must be closed or whether it should be conditionally closed. A value of one (1 or True) unconditionally closes the errorlog file; a value of zero (0 or False) only closes the errorlog file as circumstances require.

The **Close** method closes the ErrorLog file. Level:Benign is returned from this method. A Level:Fatal is returned if an error occurs.

Construct (initialize StandardErrorLogClass object)

Construct

The **Construct** method initializes the StandardErrorLogClass. It is automatically called when the object is created.

Destruct (remove the StandardErrorLogClass object)

Destruct

The **Destruct** method destroys the StandardErrorLogClass object. This method is automatically called when the object is destroyed.

Open (open standarderrorlog file)

Open(*force***), PROC, PROTECTED**

Open	Create and open the ErrorLog file.
force	An numeric constant, variable, EQUATE, or expression that indicates whether the log file must be opened or whether it should be conditionally opened. A value of one (1 or True) unconditionally opens the errorlog file; a value of zero (0 or False) only opens the errorlog file as circumstances require.

The **Open** method creates and opens the ErrorLog file. Level:Benign is returned from this method. A Level:Fatal is returned if an error occurs.

StepClass

StepClass Overview

The StepClass estimates the relative position of a given record within a keyed dataset. The StepClass is an abstract class--it is not useful by itself. However, other useful classes are derived from it and other structures (such as the BrowseClass and ProcessClass) use it to reference any of its derived classes.

StepClass Concepts

The classes derived from the StepClass let you define an upper and a lower boundary as well as a series of steps between the boundaries. Then the classes help you traverse or navigate the defined steps with a scrollbar thumb, a progress bar, or any control that shows a relative linear position within a finite range.

The classes derived from the StepClass implement some of the common variations in boundaries (alphanumeric or numeric) and steps (alphabetic distribution, surname distribution, normal distribution) that occur in the context of a browse or batch process.

The StepClass requires that the data be traversed with a key. If you are traversing data without a key, you can track your progress simply by counting records, and no StepClass is needed.

StepClass Relationship to Other Application Builder Classes

The BrowseClass and ProcessClass optionally use the classes derived from the StepClass. Therefore, if your BrowseClass or ProcessClass objects use a StepClass, then your program must instantiate a StepClass for each use.

The StepCustomClass, StepStringClass, StepLongClass, and StepRealClass are all derived from the StepClass. Each of these derived classes provides slightly different behaviors and characteristics.

StepCustomClass
: Use the StepCustomClass when the data you are processing has an alphanumeric key with a skewed distribution.

StepStringClass
: Use the StepStringClass when the data you are processing has an alphanumeric key with a normal distribution.

StepLongClass
: Use the StepLongClass when the data you are processing has an integer key with a normal distribution.

StepRealClass

Use the StepRealClass when the data you are processing has a non-integer numeric key with a normal distribution.

StepClass ABC Template Implementation

Because the StepClass is abstract, the ABC Template generated code does not directly reference the StepClass--rather, it references classes derived from the StepClass.

StepClass Source Files

The StepClass source code is installed by default to the Clarion \LIBSRC folder. The StepClass source code and its respective components are contained in:

ABBROWSE.INC	StepClass declarations
ABBROWSE.CLW	StepClass method definitions

StepClass Properties

The StepClass has a single property--Controls. This property is inherited by classes derived from StepClass. The Controls property is described below.

Controls (the StepClass sort sequence)

Controls BYTE

The **Controls** property contains a value that identifies for the StepClass object:

- the characters included in the sort sequence
- the direction of the sort (ascending or descending)

The Init method sets the value of the Controls property.

A StepClass object may be associated with a BrowseClass object sort order. The BrowseClass.AddSortOrder method sets the sort orders for a BrowseClass object.

Implementation: The Controls property is a single byte bitmap that contains several important pieces of information for the StepClass object. Set the value of the Controls property with the Init method.

See Also: Init, BrowseClass.AddSortOrder

StepClass Methods

GetPercentile (return a value's percentile:StepClass)

GetPercentile(*value* **), VIRTUAL**

GetPercentile	Returns the specified *value*'s percentile relative to the StepClass object's boundaries.
value	A constant, variable, EQUATE, or expression that specifies the value for which to calculate the percentile.

The **GetPercentile** method returns the specified *value*'s percentile relative to the StepClass object's upper and lower boundaries.

The GetPercentile method is a placeholder method for classes derived from StepClass--StepLongClass, StepRealClass, StepStringClass, StepCustomClass, etc.

Return Data Type: BYTE

See Also: StepLongClass.GetPercentile, StepRealClass.GetPercentile, StepStringClass.GetPercentile, StepCustomClass.GetPercentile

GetValue (return a percentile's value:StepClass)

GetValue(*percentile* **), VIRTUAL**

GetValue	Returns the specified *percentile*'s value relative to the StepClass object's boundaries.
percentile	An integer constant, variable, EQUATE, or expression that specifies the percentile for which to retrieve the value.

The **GetValue** method returns the specified *percentile*'s value relative to the StepClass object's upper and lower boundaries.

The GetValue method is a placeholder method for classes derived from StepClass--StepLongClass, StepRealClass, StepStringClass, StepCustomClass, etc.

Return Data Type: STRING

See Also: StepLongClass.GetValue, StepRealClass.GetValue, StepStringClass.GetValue, StepCustomClass.GetValue

Init (initialize the StepClass object)

Init(*controls* **)**

Init	Initializes the StepClass object.
controls	An integer constant, variable, EQUATE, or expression that contains several important pieces of information for the StepClass object.

The **Init** method initializes the StepClass object.

The *controls* parameter identifies for the StepClass object:

- the characters included in the sort sequence
- whether the key is case sensitive
- the direction of the sort (ascending or descending)

Implementation: The Init method sets the value of the Controls property. Set the value of the Controls property by adding together the applicable EQUATEs declared in ABBROWSE.INC as follows:

```
 ITEMIZE,PRE(ScrollSort)
AllowAlpha    EQUATE(1)    !include characters ABCDEFGHIJKLMNOPQRSTUVWXYZ
AllowAlt      EQUATE(2)    !include characters `!"£$%%^&*()''-=_+][#;~@:/.,?\|
AllowNumeric  EQUATE(4)    !include characters 0123456789
CaseSensitive EQUATE(8)    !include characters abcdefghijklmnopqrstuvwxyz
Descending    EQUATE(16)   !the sort is descending
 END
```

Example:

```
MyStepClass.Init(ScrollSort:AllowAlpha+ScrollSort:AllowNumeric)
```

See Also: Controls

Kill (shut down the StepClass object)

Kill, VIRTUAL

The **Kill** method is a virtual method to shut down the StepClass object.

The Kill method is a placeholder method for classes derived from StepClass--StepStringClass, StepCustomClass, etc.

See Also: StepStringClass.Kill, StepCustomClass.Kill

SetLimit (set smooth data distribution:StepClass)

SetLimit(*lower, upper* **), VIRTUAL**

SetLimit	Sets the StepClass object's upper and lower boundaries.
lower	A constant, variable, EQUATE, or expression that specifies the StepClass object's lower boundary. The value may be numeric or alphanumeric.
upper	A constant, variable, EQUATE, or expression that specifies the StepClass object's upper boundary. The value may be numeric or alphanumeric.

The **SetLimit** method sets the StepClass object's upper and lower boundaries.

The SetLimit method is a placeholder method for classes derived from StepClass--StepLongClass, StepRealClass, StepStringClass etc.

See Also: StepLongClass.SetLimit, StepRealClass.SetLimit, StepStringClass.SetLimit

SetLimitNeeded (return static/dynamic boundary flag:StepClass)

SetLimitNeeded, VIRTUAL

The **SetLimitNeeded** method returns a value indicating whether the StepClass object's boundaries are static (set at compile time) or dynamic (set at runtime). A return value of one (1) indicates dynamic boundaties that may need to be reset when the monitored result set changes (records are added, deleted, or filtered). A return value of zero (0) indicates the boundaries are fixed at compile time (name or alpha distribution) and are not adjusted when the monitored result set changes.

The SetLimitNeeded method is a placeholder method for classes derived from StepClass, such as StepStringClass.

Return Data Type: BYTE

See Also: StepStringClass.SetLimitNeeded

StepCustomClass

StepCustomClass Overview

The StepCustomClass is a StepClass that handles a numeric or alphanumeric key with a skewed distribution (data is not evenly distributed between the lowest and highest key values). You can provide information about the data distribution so that the StepCustomClass object returns accurate feedback about the data being processed.

StepCustomClass Concepts

You can specify a custom data distribution for a StepCustomClass object that fits a specific data set (the other StepClass objects apply one of several predefined data distributions). Use the AddItem method to set the steps or distribution points for the StepCustomClass object.

For example, your CustomerKey may contain values ranging from 1 to 10,000, but 90 percent of the values fall between 9,000 and 10,000. If your StepClass object assumes the values are *evenly* distributed between 1 and 10,000 (StepLongClass with Runtime distribution), then your progress bars and vertical scroll bar thumbs will give a misleading visual representation of the data. However, if your StepClass object knows the actual data distribution (StepCustomClass object with 90 percent of the steps between 9,000 and 10,000), then your progress bars and vertical scroll bar thumbs will give an accurate visual representation of the data.

Tip: Use the StepLongClass for integer keys with normal distribution. Use the StepStringClass for alphanumeric keys with smooth or skewed distribution. Use the StepRealClass for fractional keys with normal distribution.

Use the StepCustomClass when the data (key) is skewed (data is not evenly distributed between the lowest and highest key values), and the skew does not match any of the standard StepStringClass distribution options (see StepStringClass for more information).

StepCustomClass Relationship to Other Application Builder Classes

The BrowseClass and the ProcessClass optionally use the StepCustomClass. Therefore, if your BrowseClass or ProcessClass uses the StepCustomClass, your program must instantiate the StepCustomClass for each use. See the Conceptual Example.

StepCustomClass ABC Template Implementation

The ABC Templates (BrowseBox, Process, and Report) automatically include all the classes and generate all the code necessary to use the StepCustomClass with your BrowseBoxes, Reports, and Processes.

Process and Report Procedure Templates

By default, the Process and Report templates declare a StepStringClass, StepLongClass, or StepRealClass called ProgressMgr. However, you can use the **Report Properties** Classes tab (the **Progress Class** button) to declare a StepCustomClass (or derive from the StepCustomClass) instead. Similarly, you can use the **Process Properties** General tab (the **Progress Manager** button) to declare a StepCustomClass (or derive from the StepCustomClass). The templates provide the derived class so you can modify the ProgressMgr behavior on an instance-by-instance basis.

If you specify a StepCustomClass object for a Process or Report procedure, you must embed calls to the AddItem method (ProgressMgr.AddItem) to set the custom "steps" or distribution points.

Browse Procedure and BrowseBox Control Templates

By default, the BrowseBox template declares a StepStringClass, StepLongClass, or StepRealClass called BRWn::Sort#:StepClass, where *n* is the BrowseBox template instance number, and # is the sort order sequence (identifies the key). You can use the BrowseBox's **Scroll Bar Behavior** dialog to specify a StepCustomClass and to set the custom "steps" or distribution points. You can use the **Step Class** button to derive from the StepCustomClass so you can modify the StepCustomClass behavior on an instance-by-instance basis.

StepCustomClass Source Files

The StepCustomClass source code is installed by default to the Clarion \LIBSRC folder. The StepCustomClass source code and its respective components are contained in:

ABBROWSE.INC	StepCustomClass declarations
ABBROWSE.CLW	StepCustomClass method definitions

StepCustomClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a BrowseClass object and related objects. The example initializes and page-loads a LIST, then handles a number of associated events, including searching, scrolling, and updating. When they are initialized properly, the BrowseClass and WindowManager objects do most of the work (default event handling) internally.

```
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABREPORT.INC')

 MAP
CustomerProcess  PROCEDURE
 END

CustomerProcess  PROCEDURE

FilesOpened    BYTE
Thermometer    BYTE
Process:View   VIEW(Customer)
          END
ProgressWindow WINDOW('Progress...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
                PROGRESS,USE(Thermometer),AT(15,15,111,12),RANGE(0,100)
                STRING(''),AT(0,3,141,10),USE(?UserString),CENTER
                STRING(''),AT(0,30,141,10),USE(?PctText),CENTER
                BUTTON('Cancel'),AT(45,42,50,15),USE(?Cancel)
               END

ThisWindow CLASS(ReportManager)
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
           END
ThisProcess   ProcessClass           !declare ThisProcess object
ProgressMgr   StepCustomClass        !declare ProgressMgr object
 CODE
 GlobalResponse = ThisWindow.Run()

ThisWindow.Init  PROCEDURE()
ReturnValue  BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?Thermometer
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 CLEAR(GlobalRequest)
```

```
 CLEAR(GlobalResponse)
 Relate:Customer.Open
 FilesOpened = True
 OPEN(ProgressWindow)
 SELF.Opened=True


ProgressMgr.Init(ScrollSort:AllowNumeric)  !initialize ProgressMgr object
                                           ! ignores inapplicable parameters
 LOOP i# = 1 TO 9000 BY 1000               !build skewed distribution steps
  Step"=i#                                 !10% of customerids fall between 1 & 9000
  ProgressMgr.AddItem(Step")
 END
 LOOP i# = 9010 TO 10000 BY 11             !90% of customerids between 9000 & 10000
  Step"=i#
  ProgressMgr.AddItem(Step")
 END

 ThisProcess.Init(Process:View,Relate:Customer,?PctText,Thermometer,ProgressMgr,CUS:ID)
 ThisProcess.AddSortOrder(CUS:CustomerIDKey)
 SELF.Init(ThisProcess)
 SELF.AddItem(?Progress:Cancel,RequestCancelled)
 SELF.SetAlerts()
 RETURN ReturnValue


ThisWindow.Kill  PROCEDURE()
ReturnValue  BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
 IF FilesOpened
  Relate:Customer.Close
 END
 RETURN ReturnValue
```

StepCustomClass Properties

The StepCustomClass inherits all the properties of the StepClass from which it is derived. See *StepClass Properties* and *StepClass Concepts* for more information.

In addition to its inherited properties, the StepCustomClass also contains the following properties:

Entries (expected data distribution)

Entries &CStringList, PROTECTED

The **Entries** property is a reference to a structure containing the markers or boundaries that define the expected data distribution for the StepCustomClass object. This property defines the expected data distribution points (or steps), as well as the upper and lower boundaries the StepCustomClass object implements. This, plus the actual data distribution, ultimately determines how "far" the indicator (thumb or progress bar) actually moves as records are processed.

The AddItem method sets the value of the Entries property.

Implementation: The Entries property is a reference to a QUEUE declared in BROWSE.INC as follows:

```
CStringList  QUEUE,TYPE
Item         &CSTRING
             END
```

See Also: AddItem

StepCustomClass Methods

StepCustomClass Methods

The StepCustomClass inherits all the methods of the StepClass from which it is derived. See *StepClass Concepts* and *StepClass Methods* for more information.

AddItem (add a step marker)

AddItem(*stepmarker* **)**

AddItem	Adds a step marker to the expected data distribution for the StepCustomClass object.
stepmarker	A string constant, variable, EQUATE, or expression that specifies the next step boundary for each step of the StepCustomClass object's expected data distribution.

The **AddItem** method adds a step marker to the expected data distribution for the StepCustomClass object.

Implementation: The AddItem method sets the value of the Entries property.

Example:

```
GradeStepClass.AddItem('0')    !Failing:     0-65
GradeStepClass.AddItem('65')   !Below Average: 65-75
GradeStepClass.AddItem('75')   !Average:     75-85
GradeStepClass.AddItem('85')   !Better Than Average:85-95
GradeStepClass.AddItem('95')   !Outstanding:   95-
GradeStepClass.AddItem('1000') !Catchall upper boundary
```

See Also: Entries

GetPercentile (return a value's percentile:StepCustomClass)

GetPercentile(*value* **), VIRTUAL**

GetPercentile	Returns the specified *value*'s percentile relative to the StepCustomClass object's boundaries.
value	A string constant, variable, EQUATE, or expression that specifies the value for which to calculate the percentile.

The **GetPercentile** method returns the specified *value*'s percentile relative to the StepCustomClass object's "steps."

Implementation: The AddItem method sets the StepCustomClass object's steps.

Return Data Type: BYTE

Example:

```
IF FIELD() = ?Locator                                    !focus on locator field
 IF EVENT() = EVENT:Accepted                             !if accepted
  MyBrowse.TakeAcceptedLocator                           !BrowseClass handles it
  ?MyList{PROP:VScrollPos}=MyStep.GetPercentile(Locator) !position thumb to match
 END
END
```

See Also: AddItem

GetValue (return a percentile's value:StepCustomClass)

GetValue(*percentile* **), VIRTUAL**

GetValue	Returns the specified *percentile*'s value relative to the StepCustomClass object's boundaries.
percentile	An integer constant, variable, EQUATE, or expression that specifies the percentile for which to retrieve the value.

The **GetValue** method returns the specified *percentile*'s value relative to the StepCustomClass object's "steps."

Implementation: The AddItem method sets the StepCustomClass object's steps.

Return Data Type: STRING

Example:

```
IF FIELD() = ?MyList                                !focus on browse list
 IF EVENT() = EVENT:ScrollDrag                      !if thumb moved
  Locator=MyStep.GetValue(?MyList{PROP:VScrollPos}) !update locator to match
 END
END
```

See Also: AddItem

Init (initialize the StepCustomClass object)

Init(*controls* **)**

Init	Initializes the StepCustomClass object.
controls	An integer constant, variable, EQUATE, or expression that contains several important pieces of information for the StepCustomClass object.

The **Init** method initializes the StepCustomClass object.

The *controls* identifies for the StepCustomClass object:

- the case sensitivity
- the direction of the sort (ascending or descending)

Implementation: The Init method sets the value of the Controls property. Set the value of the Controls property by adding together the applicable EQUATEs declared in BROWSE.INC as follows:

```
 ITEMIZE,PRE(ScrollSort)
CaseSensitive  EQUATE(8)      !include abcdefghijklmnopqrstuvwxyz
Descending     EQUATE(16)     !the sort is descending
 END
```

Example:

```
 MyStepCustomClass.Init(ScrollSort:CaseSensitive)
 !program code
 MyStepCustomClass.Kill
```

See Also: StepClass.Controls

Kill (shut down the StepCustomClass object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Implementation: The Kill method frees memory allocated for the Custom property.

Example:

```
MyStepCustomClass.Init(ScrollSort:AllowAlpha+ScrollSort:AllowNumeric)
!program code
MyStepCustomClass.Kill
```

StepLongClass

StepLongClass Overview

The StepLongClass is a StepClass that handles integer keys with a normal distribution (data is evenly distributed between the lowest and highest key values).

StepLongClass Concepts

The StepLongClass object applies a normal data distribution between its upper and lower boundaries. Use the SetLimit method to set the expected data distribution for the StepLongClass object.

Use the StepLongClass with integer keys that have a normal distribution (data is evenly distributed between the lowest and highest key values).

Tip: Use the StepCustomClass for integer keys with other skews. Use the StepRealClass for non-integer numeric keys. Use the StepStringClass for alphanumeric keys.

StepLongClass Relationship to Other Application Builder Classes

The BrowseClass and the ProcessClass optionally use the StepLongClass. Therefore, if your BrowseClass or ProcessClass uses the StepLongClass, your program must instantiate the StepLongClass for each use. See the Conceptual Example.

StepLongClass ABC Template Implementation

The ABC Templates (BrowseBox, Process, and Report) automatically include all the classes and generate all the code necessary to use the StepLongClass with your BrowseBoxes, Reports, and Processes.

Process and Report Procedure Templates

By default, the Process and Report templates declare a StepLongClass for integer keys called ProgressMgr. You can use the **Report Properties** Classes tab (the **Progress Class** button) or the **Process Properties** General tab (the **Progress Manager** button) to derive from the StepLongClass instead. The templates provide the derived class so you can modify the ProgressMgr behavior on an instance-by-instance basis.

Browse Procedure and BrowseBox Control Templates

By default, the BrowseBox template declares a StepLongClass for integer keys called BRWn::Sort#:StepClass, where *n* is the BrowseBox template instance number, and # is the sort order sequence (identifies the key). You can use the BrowseBox's **Scroll Bar Behavior** dialog--**Step Class** button to derive from the StepLongClass so you can modify the StepLongClass behavior on an instance-by-instance basis.

StepLongClass Source Files

The StepLongClass source code is installed by default to the Clarion \LIBSRC folder. The StepLongClass source code and its respective components are contained in:

ABBROWSE.INC	StepLongClass declarations
ABBROWSE.CLW	StepLongClass method definitions

StepLongClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a StepLongClass object and related objects. The example batch processes a Customer file on an integer key--CustomerID.

```
  INCLUDE('ABBROWSE.INC')
  INCLUDE('ABREPORT.INC')

 MAP
CustomerProcess PROCEDURE
 END

CustomerProcess PROCEDURE

FilesOpened    BYTE
Thermometer    BYTE
Process:View   VIEW(Customer)
          END
ProgressWindow WINDOW('Progress...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
          PROGRESS,USE(Thermometer),AT(15,15,111,12),RANGE(0,100)
          STRING(''),AT(0,3,141,10),USE(?UserString),CENTER
          STRING(''),AT(0,30,141,10),USE(?PctText),CENTER
          BUTTON('Cancel'),AT(45,42,50,15),USE(?Cancel)
         END

ThisWindow   CLASS(ReportManager)
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
         END


ThisProcess   ProcessClass           !declare ThisProcess object
ProgressMgr   StepLongClass          !declare ProgressMgr object
```

```
 CODE
 GlobalResponse = ThisWindow.Run()

ThisWindow.Init  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 SELF.FirstField = ?Thermometer
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 CLEAR(GlobalRequest)
 CLEAR(GlobalResponse)
 Relate:Customer.Open
 FilesOpened = True
 OPEN(ProgressWindow)
 SELF.Opened=True
 ProgressMgr.Init(ScrollSort:AllowNumeric)   !initialize ProgressMgr object
                                             ! ignores inapplicable parameters
 ThisProcess.Init(Process:View,Relate:Customer,?PctText,Thermometer,ProgressMgr,CUS:ID)
 ThisProcess.AddSortOrder(CUS:CustomerIDKey)
 SELF.Init(ThisProcess)
 SELF.AddItem(?Progress:Cancel,RequestCancelled)
 SELF.SetAlerts()
 RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
 IF FilesOpened
  Relate:Customer.Close
 END
 RETURN ReturnValue
```

StepLongClass Properties

The StepLongClass inherits all the properties of the StepClass from which it is derived. See *StepClass Properties* for more information.

In addition to its inherited properties, the StepLongClass also contains the following properties:

Low (lower boundary:StepLongClass)

Low LONG

The **Low** property contains the value of the StepLongClass object's lower boundary.

The SetLimit method sets the value of the Low property.

See Also: SetLimit

High (upper boundary:StepLongClass)

High LONG

The **High** property contains the value of the StepLongClass object's upper boundary.

The SetLimit method sets the value of the High property.

See Also: SetLimit

StepLongClass Methods

The StepLongClass inherits all the methods of the StepClass from which it is derived. See *StepClass Methods* for more information.

In addition to (or instead of) the inherited methods, the StepLongClass contains the following methods:

GetPercentile (return a value's percentile:StepLongClass)

GetPercentile(*value* **), VIRTUAL**

GetPercentile	Returns the specified *value*'s percentile relative to the StepLongClass object's boundaries.
value	A constant, variable, EQUATE, or expression that specifies the value for which to calculate the percentile.

The **GetPercentile** method returns the specified *value*'s percentile relative to the StepLongClass object's upper and lower boundaries. For example, if the bounds are 0 and 1000 then GetPercentile(750) returns 75.

Implementation: The SetLimit method sets the StepLongClass object's upper and lower boundaries.

Return Data Type: BYTE

Example:

```
IF FIELD() = ?Locator                    !focus on locator field
 IF EVENT() = EVENT:Accepted             !if accepted
  MyBrowse.TakeAcceptedLocator           !BrowseClass handles it
  ?MyList{PROP:VScrollPos}=MyStep.GetPercentile(Locator) !position thumb to match
 END
END
```

See Also: SetLimit

GetValue (return a percentile's value:StepLongClass)

GetValue(*percentile* **), VIRTUAL**

GetValue	Returns the specified *percentile*'s value relative to the StepLongClass object's boundaries.
percentile	An integer constant, variable, EQUATE, or expression that specifies the percentile for which to retrieve the value.

The **GetValue** method returns the specified *percentile*'s value relative to the StepLongClass object's upper and lower boundaries. For example, if the bounds are 0 and 1000 then GetValue(25) returns '250'.

Implementation: The SetLimit method sets the StepLongClass object's upper and lower boundaries.

Return Data Type: STRING

Example:

```
IF FIELD() = ?MyList                                !focus on browse list
 IF EVENT() = EVENT:ScrollDrag                      !if thumb moved
  Locator=MyStep.GetValue(?MyList{PROP:VScrollPos})!update locator to match
 END
END
```

See Also: SetLimit

SetLimit (set smooth data distribution:StepLongClass)

SetLimit(*lower, upper* **), VIRTUAL**

SetLimit	Sets the StepLongClass object's evenly distributed steps between *upper* and *lower*.
lower	An integer constant, variable, EQUATE, or expression that specifies the StepLongClass object's lower boundary.
upper	An integer constant, variable, EQUATE, or expression that specifies the StepLongClass object's upper boundary.

The **SetLimit** method sets the StepLongClass object's evenly distributed steps between *upper* and *lower*. The StepLongClass object (GetPercentile and GetValue methods) uses these steps to estimate key values and percentiles for the processed data.

Implementation: The BrowseClass.ResetThumbLimits (a PRIVATE method) and the ProcessClass.SetProgressLimits methods call the SetLimit method to calculate the expected data distribution for the data. The SetLimit method sets 100 evenly distributed "steps" or markers between *lower* and *upper*.

Example:

```
MyStep.SetLimit(1,9700)      !establish scrollbar steps and boundaries
```

See Also: GetPercentile, GetValue, ProcessClass.SetProgressLimits

StepLocatorClass

StepLocatorClass Overview

The StepLocatorClass is a LocatorClass that accepts a *single character* search value, and does a *continuous (wrap around) search* starting from the current item so you can, for example, find the next item that begins with the search value (say, 'T'), then continue to the next item that begins with the same search value, etc. If there are no matching values, the step locator proceeds the the next highest item.

Use a Step Locator when the search field is a STRING, CSTRING, or PSTRING, a single character search is sufficient (a step locator is not appropriate when there are many key values that begin with the same character), and you want the search to take place immediately upon the end user's keystroke. Step Locators are not appropriate for numeric keys.

StepLocatorClass Concepts

A Step Locator is a single-character locator with no locator control required.

The StepLocatorClass lets you specify a locator control and a sort field on which to search (the free key element) for a BrowseClass object. The BrowseClass object uses the StepLocatorClass to locate and scroll to the nearest matching item.

When the BrowseClass LIST has focus and the user types a character, the BrowseClass object advances the list to the next matching item (or the subsequent item if there is no match).

StepLocatorClass Relationship to Other Application Builder Classes

The BrowseClass uses the StepLocatorClass to locate and scroll to the nearest matching item. Therefore, if your program's BrowseClass objects use a Step Locator, your program must instantiate the StepLocatorClass for each use. Once you register the StepLocatorClass object with the BrowseClass object (see BrowseClass.AddLocator), the BrowseClass object uses the StepLocatorClass object as needed, with no other code required. See the Conceptual Example.

StepLocatorClass ABC Template Implementation

The ABC BrowseBox template generates code to instantiate the StepLocatorClass for your BrowseBoxes. The StepLocatorClass objects are called BRW*n*::Sort#:Locator, where *n* is the template instance number and # is the sort sequence (id) number. As this implies, you can have a different locator for each BrowseClass object sort order.

You can use the BrowseBox's **Locator Behavior** dialog (the **Locator Class** button) to derive from the EntryLocatorClass. The templates provide the derived class so you can modify the locator's behavior on an instance-by-instance basis.

StepLocatorClass Source Files

The StepLocatorClass source code is installed by default to the Clarion \LIBSRC folder. The StepLocatorClass source code and its respective components are contained in:

ABBROWSE.INC	StepLocatorClass declarations
ABBROWSE.CLW	StepLocatorClass method definitions

StepLocatorClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a BrowseClass object and related objects, including a StepLocatorClass object. The example initializes and page-loads a LIST, then handles a number of associated events, including scrolling, updating, and locating records.

Note that the WindowManager and BrowseClass objects internally handle the normal events surrounding the locator.

```
 PROGRAM
 INCLUDE('ABWINDOW.INC')              !declare WindowManager class
 INCLUDE('ABBROWSE.INC')              !declare BrowseClass and Locator
  MAP
  END
State        FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey  KEY(ST:STATECODE),NOCASE,OPT
Record        RECORD,PRE()
STATECODE      STRING(2)
STATENAME      STRING(20)
              END
             END
StView      VIEW(State)              !declare VIEW to process
            END
StateQ        QUEUE                  !declare Q for LIST
ST:STATECODE   LIKE(ST:STATECODE)
ST:STATENAME   LIKE(ST:STATENAME)
ViewPosition   STRING(512)
              END
Access:State CLASS(FileManager)      !declare Access:State object
Init         PROCEDURE
             END
Relate:State CLASS(RelationManager)  !declare Relate:State object
Init         PROCEDURE
             END
VCRRequest   LONG(0),THREAD
StWindow WINDOW('Browse States'),AT(,,123,152),IMM,SYSTEM,GRAY
          LIST,AT(8,5,108,124),USE(?StList),IMM,HVSCROLL,FROM(StateQ),|
          FORMAT('27L(2)|M~CODE~@s2@80L(2)|M~STATENAME~@s20@')
         END
```

```
ThisWindow CLASS(WindowManager)       !declare ThisWindow object
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END
BrowseSt  CLASS(BrowseClass)          !declare BrowseSt object
Q         &StateQ
          END
StLocator StepLocatorClass            !declare StLocator object
StStep   StepStringClass              !declare StStep object

 CODE
 ThisWindow.Run()                     !run the window procedure

ThisWindow.Init  PROCEDURE()           !initialize things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()           !call base class init
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Init                     !initialize Relate:State object
 SELF.FirstField = ?StList             !set FirstField for ThisWindow
 SELF.VCRRequest &= VCRRequest         !VCRRequest not used
 Relate:State.Open                     !open State and related files
 !Init BrowseSt object by naming its LIST,VIEW,Q,RelationManager & WindowManager
 BrowseSt.Init(?StList,StateQ.ViewPosition,StView,StateQ,Relate:State,SELF)
 OPEN(StWindow)
 SELF.Opened=True
 BrowseSt.Q &= StateQ                  !reference the browse QUEUE
 StStep.Init(+ScrollSort:AllowAlpha,ScrollBy:Runtime)!initialize the StStep
object
 BrowseSt.AddSortOrder(StStep,ST:StateCodeKey)!set the browse sort order
 BrowseSt.AddLocator(StLocator)        !plug in the browse locator
 StLocator.Init(,ST:STATECODE,1,BrowseSt)   !initialize the locator object
 BrowseSt.AddField(ST:STATECODE,BrowseSt.Q.ST:STATECODE) !set a column to browse
 BrowseSt.AddField(ST:STATENAME,BrowseSt.Q.ST:STATENAME) !set a column to browse
 SELF.SetAlerts()                      !alert any keys for ThisWindow
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()           !shut down things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()           !call base class shut down
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Close                    !close State and related files
 Relate:State.Kill                     !shut down Relate:State object
 GlobalErrors.Kill                     !shut down GlobalErrors object
 RETURN ReturnValue
```

StepLocatorClass Properties

The StepLocatorClass inherits all the properties of the LocatorClass from which it is derived. See *LocatorClass Properties* for more information.

StepLocatorClass Methods

StepLocatorClass Methods

The StepLocatorClass inherits all the methods of the LocatorClass from which it is derived. See *LocatorClass Methods* for more information.

In addition to (or instead of) the inherited methods, the StepLocatorClass contains the following methods:

Set (restart the locator:StepLocatorClass)

Set, DERIVED

The **Set** method prepares the locator for a new search.

Implementation: The Set method does nothing because each new step locator search reprimes the locator's FreeElement--since the step locator is a single character search.

Example:

```
BrowseClass.SetSort PROCEDURE(BYTE B,BYTE Force)
 CODE
 IF SELF.SetSort(B)
  IF ~SELF.Sort.Locator &= NULL
   SELF.Sort.Locator.Set
  END
 END
```

TakeKey (process an alerted keystroke:StepLocatorClass)

TakeKey, DERIVED

The **TakeKey** method processes an alerted keystroke for the LIST control and returns a value indicating whether the browse list display must change.

Tip: By default, all alphanumeric keys are alerted for LIST controls.

Implementation: The TakeKey method primes the FreeElement property with the appropriate search value, then returns one (1) if a new search is required or returns zero (0) if no new search is required. A search is required only if the keystroke is a valid search character.

Return Data Type: BYTE

Example:

```
IF SELF.Sort.Locator.TakeKey()        ! process the search key
  SELF.Reset(1)                       ! if valid, reset the view
  SELF.ResetQueue( Reset:Done )       ! and the browse queue
END
```

See Also: FreeElement

StepRealClass

StepRealClass Overview

The StepRealClass is a StepClass that handles fractional (non-integer) keys with a normal distribution (data is evenly distributed between the lowest and highest key values).

StepRealClass Concepts

The StepRealClass object applies a normal data distribution between its upper and lower boundaries. Use the SetLimit method to set the expected data distribution for the StepRealClass object. Use the StepRealClass with non-integer numeric keys that have a normal distribution (data is evenly distributed between the lowest and highest key values).

Tip: Use the StepLongClass for integer numeric keys. Use the StepStringClass for alphanumeric keys. Use the StepCustomClass for keys with skewed distributions.

StepRealClass Relationship to Other Application Builder Classes

The BrowseClass and the ProcessClass optionally use the StepRealClass. Therefore, if your BrowseClass or ProcessClass uses the StepRealClass, your program must instantiate the StepRealClass for each use. See the Conceptual Example.

StepRealClass ABC Template Implementation

The ABC Templates (BrowseBox, Process, and Report) automatically include all the classes and generate all the code necessary to use the StepRealClass with your BrowseBoxes, Reports, and Processes.

Process and Report Procedure Templates

By default, the Process and Report templates declare a StepRealClass for fractional keys called ProgressMgr. You can use the **Report Properties** Classes tab (the **Progress Class** button) or the **Process Properties** General tab (the **Progress Manager** button) to derive from the StepRealClass instead. The templates provide the derived class so you can modify the ProgressMgr behavior on an instance-by-instance basis.

Browse Procedure and BrowseBox Control Templates

By default, the BrowseBox template declares a StepRealClass for non-integer numeric keys called BRWn::Sort#:StepClass, where *n* is the BrowseBox template instance number, and # is the sort order sequence (identifies the key). You can use the BrowseBox's **Scroll Bar Behavior** dialog--**Step Class** button to derive from the StepRealClass so you can modify the StepRealClass behavior on an instance-by-instance basis.

StepRealClass Source Files

The StepRealClass source code is installed by default to the Clarion \LIBSRC folder. The StepRealClass source code and its respective components are contained in:

ABBROWSE.INC	StepRealClass declarations
ABBROWSE.CLW	StepRealClass method definitions

StepRealClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a StepRealClass object and related objects. The example batch-processes a Customer file on a fractional (non-integer) key--CustomerID.

```
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABREPORT.INC')

 MAP
 CustomerProcess  PROCEDURE
 END

CustomerProcess  PROCEDURE

FilesOpened     BYTE
Thermometer     BYTE
Process:View    VIEW(Customer)
                END
ProgressWindow WINDOW('Progress...'),AT(,,142,59),CENTER,TIMER(1),GRAY,DOUBLE
          PROGRESS,USE(Thermometer),AT(15,15,111,12),RANGE(0,100)
          STRING(''),AT(0,3,141,10),USE(?UserString),CENTER
          STRING(''),AT(0,30,141,10),USE(?PctText),CENTER
          BUTTON('Cancel'),AT(45,42,50,15),USE(?Cancel)
         END

ThisWindow   CLASS(ReportManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
             END

ThisProcess   ProcessClass            !declare ThisProcess object
ProgressMgr   StepRealClass           !declare ProgressMgr object

  CODE
  GlobalResponse = ThisWindow.Run()

ThisWindow.Init  PROCEDURE()
ReturnValue     BYTE,AUTO
  CODE
```

```
SELF.Request = GlobalRequest
ReturnValue = PARENT.Init()
IF ReturnValue THEN RETURN ReturnValue.
SELF.FirstField = ?Thermometer
SELF.VCRRequest &= VCRRequest
SELF.Errors &= GlobalErrors
CLEAR(GlobalRequest)
CLEAR(GlobalResponse)
Relate:Customer.Open
FilesOpened = True
OPEN(ProgressWindow)
SELF.Opened=True
ProgressMgr.Init(ScrollSort:AllowNumeric)   !initialize ProgressMgr object
                                             ! ignores inapplicable parameters
ThisProcess.Init(Process:View,Relate:Customer,?PctText,Thermometer,ProgressMgr,CUS:ID)
ThisProcess.AddSortOrder(CUS:CustomerIDKey)
SELF.Init(ThisProcess)
SELF.AddItem(?Progress:Cancel,RequestCancelled)
SELF.SetAlerts()
RETURN ReturnValue

ThisWindow.Kill PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
  IF FilesOpened
   Relate:Customer.Close
  END
 RETURN ReturnValue
```

StepRealClass Properties

StepRealClass Properties

The StepRealClass inherits all the properties of the StepClass from which it is derived. See *StepClass Properties* for more information.

In addition to its inherited properties, the StepRealClass also contains the following properties:

Low (lower boundary:StepRealClass)

Low REAL

The **Low** property contains the value of the StepRealClass object's lower boundary.

The SetLimit method sets the value of the Low property.

See Also: SetLimit

High (upper boundary:StepRealClass)

High REAL

The **High** property contains the value of the StepRealClass object's upper boundary.

The SetLimit method sets the value of the High property.

See Also: SetLimit

StepRealClass Methods

StepRealClass Methods

The StepRealClass inherits all the methods of the StepClass from which it is derived. See *StepClass Methods* for more information.

In addition to (or instead of) the inherited methods, the StepRealClass contains the following methods:

GetPercentile (return a value's percentile:StepRealClass)

GetPercentile(*value* **), VIRTUAL**

GetPercentile	Returns the specified *value*'s percentile relative to the StepRealClass object's boundaries.
value	A constant, variable, EQUATE, or expression that specifies the value for which to calculate the percentile.

The **GetPercentile** method returns the specified *value*'s percentile relative to the StepRealClass object's upper and lower boundaries. For example, if the bounds are 0 and 1000 then GetPercentile(750) returns 75.

Implementation: The SetLimit method sets the StepRealClass object's upper and lower boundaries.

Return Data Type: BYTE

Example:

```
IF FIELD() = ?Locator                    !focus on locator field
 IF EVENT() = EVENT:Accepted             !if accepted
  MyBrowse.TakeAcceptedLocator           !BrowseClass handles it
  ?MyList{PROP:VScrollPos}=MyStep.GetPercentile(Locator) !position thumb to match
 END
END
```

See Also: SetLimit

GetValue (return a percentile's value:StepRealClass)

GetValue(*percentile* **), VIRTUAL**

GetValue	Returns the specified *percentile*'s value relative to the StepRealClass object's boundaries.
percentile	An integer constant, variable, EQUATE, or expression that specifies the percentile for which to retrieve the value.

The **GetValue** method returns the specified *percentile*'s value relative to the StepRealClass object's upper and lower boundaries. For example, if the bounds are 0 and 1000 then GetValue(25) returns '250'.

Implementation: The SetLimit method sets the StepRealClass object's upper and lower boundaries.

Return Data Type: STRING

Example:

```
IF FIELD() = ?MyList                    !focus on browse list
 IF EVENT() = EVENT:ScrollDrag          !if thumb moved
  Locator=MyStep.GetValue(?MyList{PROP:VScrollPos})!update locator to match
 END
END
```

See Also: SetLimit

SetLimit (set smooth data distribution:StepRealClass)

SetLimit(*lower, upper* **), VIRTUAL**

SetLimit	Sets the StepRealClass object's evenly distributed steps between *upper* and *lower*.
lower	An integer constant, variable, EQUATE, or expression that specifies the StepRealClass object's lower boundary.
upper	An integer constant, variable, EQUATE, or expression that specifies the StepRealClass object's upper boundary.

The **SetLimit** method sets the StepRealClass object's evenly distributed steps between *upper* and *lower*. The StepRealClass object (GetPercentile and GetValue methods) uses these steps to estimate key values and percentiles for the processed data.

Implementation: The BrowseClass.ResetThumbLimits (a PRIVATE method) and the ProcessClass.SetProgressLimits methods call the SetLimit method to calculate the expected data distribution for the data. The SetLimit method sets 100 evenly distributed "steps" or markers between *lower* and *upper*.

Example:

```
MyStep.SetLimit(1,9700)   !establish scrollbar steps and boundaries
```

See Also: GetPercentile, GetValue, ProcessClass.SetProgressLimits

StepStringClass

StepStringClass Overview

The StepStringClass is a StepClass that handles alphanumeric keys with a normal distribution (data is evenly distributed between the lowest and highest key values) or with English Alphabet or US Surname distribution. You can provide information about the data distribution so that the StepStringClass object returns accurate feedback about the data being processed.

StepStringClass Concepts

You can set the expected data distribution for a StepStringClass object--the StepStringClass object applies one of several predefined data distributions. Use the Init and SetLimit methods to set the expected data distribution for the StepStringClass object.

For example, your NameKey may contain US Surname values ranging from 'Aabel' to 'Zuger.' If your StepClass assumes the values are evenly distributed between these values, then your progress bars and vertical scroll bar thumbs will give an inaccurate visual representation of the data. However, if your StepClass assumes a typical US Surname distribution, then your progress bars and vertical scroll bar thumbs will give an accurate visual representation of the data.

Use the StepStringClass with alphanumeric keys that have a normal distribution (data is evenly distributed between the lowest and highest key values) or with English Alphabet or US Surname distribution.

Tip: Use the StepLongClass for integer keys with normal distribution. Use the StepRealClass for fractional keys with normal distribution. Use the StepCustomClass for numeric or alphanumeric keys with skewed distribution.

StepStringClass Relationship to Other Application Builder Classes

The BrowseClass and the ProcessClass optionally use the StepStringClass. Therefore, if your BrowseClass or ProcessClass uses the StepStringClass, your program must instantiate the StepStringClass for each use. See the Conceptual Example.

StepStringClass ABC Template Implementation

The ABC Templates (BrowseBox, Process, and Report) automatically include all the classes and generate all the code necessary to use the StepStringClass with your BrowseBoxes, Reports, and Processes.

Process and Report Procedure Templates

By default, the Process and Report templates declare a StepStringClass for alphanumeric keys called ProgressMgr. You can use the **Report Properties** Classes tab (the **Progress Class** button) or the **Process Properties** General tab (the **Progress Manager** buttonto derive from the StepStringClass instead. The templates provide the derived class so you can modify the ProgressMgr behavior on an instance-by-instance basis.

Browse Procedure and BrowseBox Control Templates

By default, the BrowseBox template declares a StepStringClass for alphanumeric keys called BRWn::Sort#:StepClass, where *n* is the BrowseBox template instance number, and # is the sort order sequence (identifies the key). You can use the BrowseBox's **Scroll Bar Behavior** dialog to specify the expected data distribution (normal distribution, English alphabet, or US surname). You can use the **Step Class** button to derive from the StepStringClass so you can modify the StepStringClass behavior on an instance-by-instance basis.

StepStringClass Source Files

The StepStringClass source code is installed by default to the Clarion \LIBSRC folder. The StepStringClass source code and its respective components are contained in:

ABBROWSE.INC	StepStringClass declarations
ABBROWSE.CLW	StepStringClass method definitions

StepStringClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a StepStringClass object and related objects. The example initializes and page-loads a LIST, then handles a number of associated events, including scrolling.

The StepStringClass object's steps are calculated based on the poles of the actual browsed data--a list of State abbreviations.

```
  PROGRAM
 INCLUDE('ABWINDOW.INC')           !declare WindowManager class
 INCLUDE('ABBROWSE.INC')           !declare BrowseClass & StepClasses
 MAP
 END

State       FILE,DRIVER('TOPSPEED'),PRE(ST),THREAD
StateCodeKey KEY(ST:STATECODE),NOCASE,OPT
Record       RECORD,PRE()
STATECODE     STRING(2)
STATENAME     STRING(20)
             END
            END

StView    VIEW(State)             !declare VIEW to process
          END

StateQ      QUEUE                 !declare Q for LIST
ST:STATECODE LIKE(ST:STATECODE)
ST:STATENAME LIKE(ST:STATENAME)
ViewPosition STRING(512)
            END

GlobalErrors ErrorClass
Access:State CLASS(FileManager)
Init         PROCEDURE
             END
Relate:State CLASS(RelationManager)
Init         PROCEDURE
             END
VCRRequest  LONG(0),THREAD

StWindow WINDOW('Browse States'),AT(,,123,152),IMM,SYSTEM,GRAY
      LIST,AT(8,5,108,124),USE(?StList),IMM,HVSCROLL,FROM(StateQ),|
      FORMAT('27L(2)|M~CODE~@s2@80L(2)|M~STATENAME~@s20@')
      BUTTON('&Insert'),AT(8,133),USE(?Insert)
      BUTTON('&Change'),AT(43,133),USE(?Change),DEFAULT
      BUTTON('&Delete'),AT(83,133),USE(?Delete)
```

```
     END

ThisWindow CLASS(WindowManager)
Init       PROCEDURE(),BYTE,PROC,VIRTUAL
Kill       PROCEDURE(),BYTE,PROC,VIRTUAL
           END

BrowseSt  CLASS(BrowseClass)             !declare BrowseSt object
Q         &StateQ
          END

StStep   StepStringClass              !declare StStep object

 CODE
 ThisWindow.Run()                     !run the window procedure

ThisWindow.Init  PROCEDURE()          !initialize things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 IF ReturnValue THEN RETURN ReturnValue.
 GlobalErrors.Init
 Relate:State.Init
 SELF.FirstField = ?StList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 Relate:State.Open
 BrowseSt.Init(?StList,StateQ.ViewPosition,StView,StateQ,Relate:State,SELF)
 OPEN(StWindow)
 SELF.Opened=True
 BrowseSt.Q &= StateQ
 StStep.Init(+ScrollSort:AllowAlpha,ScrollBy:Runtime)!initialize the StStep object
 BrowseSt.AddSortOrder(StStep,ST:StateCodeKey)    ! & plug in to the BrowseSt
                           ! BrowseSt calls SetLimit to
                           ! calculate data distribution
                           ! from the poles of the data
 BrowseSt.AddField(ST:STATECODE,BrowseSt.Q.ST:STATECODE)
 BrowseSt.AddField(ST:STATENAME,BrowseSt.Q.ST:STATENAME)
 SELF.SetAlerts()
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()           !shut down things
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 IF ReturnValue THEN RETURN ReturnValue.
 Relate:State.Close
 Relate:State.Kill
```

```
 GlobalErrors.Kill
 RETURN ReturnValue

Access:State.Init PROCEDURE
 CODE
 PARENT.Init(State,GlobalErrors)
 SELF.FileNameValue = 'State'
 SELF.Buffer &= ST:Record
 SELF.AddKey(ST:StateCodeKey,'ST:StateCodeKey',0)

Relate:State.Init PROCEDURE
 CODE
 Access:State.Init
 PARENT.Init(Access:State,1)
```

StepStringClass Properties

The StepStringClass inherits all the properties of the StepClass from which it is derived. See *StepClass Properties* for more information. In addition to its inherited properties, the StepStringClass also contains the following properties:

LookupMode (expected data distribution)

LookupMode BYTE

The **LookupMode** property sets the *expected* data distribution the StepStringClass object implements. This, plus the *actual* data distribution, ultimately determines how "far" the indicator (scrollbar thumb or progress bar) actually moves as records are processed. The Init method sets the value of the LookupMode property.

Implementation: Valid data distribution options are U.S. surnames, English alphabet, and runtime data distribution calculated from the poles of the actual data. Corresponding LookupMode EQUATEs are declared in ABBROWSE.INC as follows:

```
 ITEMIZE,PRE(ScrollBy)
Name    EQUATE  !U.S. surnames distribution
Alpha   EQUATE  !English alphabet distribution
Runtime EQUATE  !calculate distribution from runtime poles
 END
```

The U.S. surnames and English alphabet data distributions are defined in ABBROWSE.CLW as follows:

```
Scroll:Alpha STRING('  AFANATB BFBNBTC CFCNCT'|
          &'D DFDNDTE EFENETF FFFNFT'|
          &'G GFGNGTH HFHNHTI IFINIT'|
          &'J JFJNJTK KFKNKTL LFLNLT'|
          &'M MFMNMTN NFNNNTO OFONOT'|
          &'P PFPNPTQ QNR RFRNRTS SF'|
          &'SNSTT TFTNTTU UFUNUTV VF'|
          &'VNVTW WFWNWTX XFXNXTY YF'|
          &'YNYTZ ZN')
Scroll:Name  STRING('   ALBAMEARNBAKBATBENBIABOBBRA'|
          &'BROBUACACCARCENCHRCOECONCORCRU'|
          &'DASDELDIADONDURELDEVEFELFISFLO'|
          &'FREFUTGARGIBGOLGOSGREGUTHAMHEM'|
          &'HOBHOTINGJASJONKAGKEAKIRKORKYO'|
          &'LATLEOLIGLOUMACMAQMARMAUMCKMER'|
          &'MILMONMORNATNOLOKEPAGPAUPETPIN'|
          &'PORPULRAUREYROBROSRUBSALSCASCH'|
          &'SCRSHASIGSKISNASOUSTESTISUNTAY'|
          &'TIRTUCVANWACWASWEIWIEWIMWOLYOR')
```

See Also: Init

Root (the static portion of the step)

Root &CSTRING, PROTECTED

The **Root** property is a reference to a structure containing the static or non-determinitive characters of a step. For example, if the step bounds are 'abbey' and 'abracadabra' then Root contains 'ab'. The related property TestLen is equal to the length of Root, that is, 2.

Implementation: The GetPercentile and GetValue methods use the Root and TestLen properties to efficiently traverse the defined steps.

See Also: GetPercentile, GetValue, TestLen

SortChars (valid sort characters)

SortChars &CSTRING

The **SortChars** property is a reference to a structure containing the valid sort characters for the StepStringClass object. The StepStringClass object uses the SortChars property to compute steps. For example if SortChars contains only 'ABYZ' then that is the information the StepStringClass uses to compute your steps.

The Init method sets the value of the SortChars property.

Implementation: The SortChars property only affects StepStringClass objects with a LookupMode specifying runtime data distribution. The SetLimit method computes the runtime data distribution.

See Also: Init, LookupMode, SetLimit

TestLen (length of the static step portion)

TestLen BYTE, PROTECTED

The **TestLen** property contains the length of the Root property. For example, if the step bounds are 'abbey' and 'abracadabra' then Root contains 'ab'. The related property TestLen is equal to the length of Root, that is, 2.

The Init method sets the value of the TestLen property.

Implementation: The GetPercentile and GetValue methods use the Root and TestLen properties to efficiently traverse the defined steps.

The value of the TestLen property depends on the value of the LookupMode property. LookupMode of U.S. surnames uses TestLen of 3, English alphabet uses TestLen of 2, and runtime data distribution uses TestLen of 4.

See Also: Init, LookupMode, Root

StepStringClass Methods

The StepStringClass inherits all the methods of the StepClass from which it is derived. See *StepClass Methods* for more information.

In addition to (or instead of) the inherited methods, the StepStringClass contains the following methods:

GetPercentile (return a value's percentile)

GetPercentile(*value* **), VIRTUAL**

GetPercentile	Returns the specified *value*'s percentile relative to the StepStringClass object's boundaries.
value	A string constant, variable, EQUATE, or expression that specifies the value for which to calculate the percentile.

The **GetPercentile** method returns the specified *value*'s percentile relative to the StepStringClass object's upper and lower boundaries. For example, if the bounds are 'A' and 'Z' then GetPercentile('M') returns 50.

Implementation: The SetLimit method sets the StepStringClass object's upper and lower boundaries.

Return Data Type: BYTE

Example:

```
IF FIELD() = ?Locator                  !focus on locator field
 IF EVENT() = EVENT:Accepted           !if accepted
  MyBrowse.TakeAcceptedLocator         !BrowseClass handles it
  ?MyList{PROP:VScrollPos}=MyStep.GetPercentile(Locator) !position thumb to match
 END
END
```

See Also: SetLimit

GetValue (return a percentile's value)

GetValue(*percentile* **), VIRTUAL**

GetValue	Returns the specified *percentile*'s value relative to the StepStringClass object's boundaries.
percentile	An integer constant, variable, EQUATE, or expression that specifies the percentile for which to retrieve the value.

The **GetValue** method returns the specified *percentile*'s value relative to the StepStringClass object's upper and lower boundaries. For example, if the bounds are 'A' and 'Z' then GetValue(50) returns 'M'.

Implementation: The SetLimit method sets the StepStringClass object's upper and lower boundaries.

Return Data Type: STRING

Example:

```
IF FIELD() = ?MyList                      !focus on browse list
 IF EVENT() = EVENT:ScrollDrag            !if thumb moved
  Locator=MyStep.GetValue(?MyList{PROP:VScrollPos})!update locator to match
 END
END
```

See Also: SetLimit

Init (initialize the StepStringClass object)

Init(*controls, mode* **)**

Init	Initializes the StepStringClass object.
controls	An integer constant, variable, EQUATE, or expression that contains several important pieces of information for the StepClass object.
mode	An integer constant, variable, EQUATE, or expression that determines the data distribution points (or steps) the StepStringClass object implements.

The **Init** method initializes the StepStringClass object.

The *controls* parameter identifies for the StepClass object:

- the characters included in the calculated runtime distribution
- whether the key is case sensitive
- the direction of the sort (ascending or descending)

A *mode* parameter value of ScrollBy:Name gives U.S. surname distribution, ScrollBy:Alpha gives English alphabet distribution, and ScrollBy:Runtime gives a smooth data distribution from the poles of the actual data, as calculated by the SetLimit method.

Implementation: The Init method sets the value of the Controls and LookupMode properties. Set the value of the Controls property by adding together the applicable EQUATEs declared in ABBROWSE.INC as follows:

```
 ITEMIZE,PRE(ScrollSort)
AllowAlpha  EQUATE(1)  !include ABCDEFGHIJKLMNOPQRSTUVWXYZ
AllowAlt    EQUATE(2)  !include `!"£$%%^&*()''-=_+][#;~@:/.,?\|
AllowNumeric EQUATE(4) !include 0123456789
CaseSensitive EQUATE(8)!include abcdefghijklmnopqrstuvwxyz
Descending  EQUATE(16) !the sort is descending
```

EQUATEs for the *mode* parameter ared declared in ABBROWSE.INC as follows:

```
    ITEMIZE,PRE(ScrollBy)
Name   EQUATE     !US Surname distribution
Alpha  EQUATE     !English alphabet distribution
Runtime EQUATE    !calculate normal distribution from data poles
    END
```

Example:

```
 MyStepStringClass.Init(ScrollSort:AllowAlpha+ScrollSort:AllowNumeric)
 !program code
 MyStepStringClass.Kill
```

See Also: StepClass.Controls, LookupMode, SetLimit

Kill (shut down the StepStringClass object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Implementation: The Kill method frees memory allocated for the Ref, Root, and SortChars properties.

Example:

```
MyStepStringClass.Init(ScrollSort:AllowAlpha+ScrollSort:AllowNumeric)
!program code
MyStepStringClass.Kill
```

SetLimit (set smooth data distribution:StepStringClass)

SetLimit(*lower, upper* **), VIRTUAL**

SetLimit	Sets the StepStringClass object's evenly distributed steps between *upper* and *lower*.
lower	A string constant, variable, EQUATE, or expression that specifies the StepStringClass object's lower boundary. The value may be numeric or alphanumeric.
upper	A string constant, variable, EQUATE, or expression that specifies the StepStringClass object's upper boundary. The value may be numeric or alphanumeric.

The **SetLimit** method sets the StepStringClass object's evenly distributed steps between *upper* and *lower*. The StepStringClass object (GetPercentile and GetValue methods) uses these steps to estimate key values and percentiles for the processed data.

Implementation: The BrowseClass.ResetThumbLimits (a PRIVATE method) and the ProcessClass.SetProgressLimits methods call the SetLimit method to calculate the expected data distribution for the data. The SetLimit method sets 100 evenly distributed "steps" or markers between *lower* and *upper*. SetLimit considers the Controls property (as set by the Init method) when calculating the expected data distribution.

Example:

```
MyStep.SetLimit('A','Z')      !establish uppercase alphabetic scrollbar limits
```

See Also: GetPercentile, GetValue, Init, ProcessClass.SetProgressLimits, StepClass.Controls

SetLimitNeeded (return static/dynamic boundary flag:StepStringClass)

SetLimitNeeded, VIRTUAL

The **SetLimitNeeded** method returns a value indicating whether the StepClass object's steps and boundaries are static (set at compile time) or dynamic (set at runtime). A return value of one (1) indicates dynamic boundaries that may need to be reset when the monitored result set changes (records are added, deleted, or filtered). A return value of zero (0) indicates the boundaries are fixed at compile time (name or alpha distribution) and are not adjusted when the monitored result set changes.

Implementation: The SetLimitNeeded method returns one (1 or True) if the LookupMode property equals ScrollBy:RunTime; otherwise it returns zero (0 or False).

Return Data Type: BYTE

Example:

```
BrowseClass.ResetThumbLimits PROCEDURE
HighValue ANY
  CODE
  IF SELF.Sort.Thumb &= NULL OR ~SELF.Sort.Thumb.SetLimitNeeded()
    RETURN
  END
  SELF.Reset
  IF SELF.Previous()
    RETURN
  END
  HighValue = SELF.Sort.FreeElement
  SELF.Reset
  IF SELF.Next()
    RETURN
  END
  SELF.Sort.Thumb.SetLimit(SELF.Sort.FreeElement,HighValue)
```

See Also: StepClass.SetLimitNeeded

TagHTMLHelp Class

TagHTMLHelpOverview

HTML Help is emerging as the new standard help file format. HTML Help is distributed in a single (.chm) file. This file is compressed and made from several .html files. All images, table of contents, index, and search files are compiled into this single .chm file. This makes for easier distribution of your help system.

HTML Help is available on any 32-bit windows platform, Windows 95/98, Windows 2000, and NT 4. On Windows 95 and NT 4, the HTML Help Display Engine, Internet Explorer 4.0 or later, or Microsoft Office 2000 must be installed on the user's system.

TagHTMLHelp Class Concepts

Clarion's HTML Help implementation is a DLL that communicates with the Microsoft HTML System. The DLL is accessed by the TagHTMLHelp Class. Clarion's HTML Help intercepts the call to the Windows Help system when the F1 key is pressed. These calls are re-directed to the HTML Help System. There are several templates available which make the HTML Help system easily accessible from your Clarion program. Accessing Topics, Table of Contents, Indexing, Searching, Keywords, and Hyperlinks are a snap.

Relationship to Other Application Builder Classes

The TagHTMLHelp class works independently of all other ABC classes.

TagHTMLHelp ABC Template Implementation

Once the cwHH global template extension is added to the application, the templates instantiate a TagHTMLHelp object into the generated code for the main procedure of the application. This is also where the TagHTMLHelp object is initialized.

TagHTMLHelp Source Files

The TagHTMLHelp class declarations are installed by default to the Clarion \LIBSRC folder. The TagHTMLHelp component is distributed as a LIB/DLL, therefore the source code for the methods is not available. However, the methods are defined in this chapter and may be implemented in applications provided the required LIB/DLL is available at runtime.

cwHH.INC	Help Class Definition
cwHHL.INC	Help Class Definition Local Compile
cwHH60.dll	Help DLL
cwHH60.lib	Help LIB
cwHHL.lib	Help Local LIB

TagHTMLHelp Methods

The TagHTMLHelp class contains the following methods.

AlinkLookup (associative link lookup)

AlinkLookup(*keywords***, |** *messagetext***,** *messagetitle* **|)**

AlinkLookup	Look up one or more Associative link (Alink) names within a compiled help (.chm) file.
keywords	A string constant, variable, EQUATE, or expression containing the Associative link (*keyword*) to search for. Multiple keywords can be used by concatenating them with semicolons (;).
messagetext	A string constant, variable, EQUATE, or expression containing the message to display in a message box if the Alink is not found.
messagetitle	A string constant, variable, EQUATE, or expression containing the title of the message box dialog.

The **AlinkLookup** method looks up one or more Associative link (Alink) names within a compiled help (.chm) file. Associative links are used to link related help topics to each other. When a link that contains an Alink is clicked, a popup window appears with the list of related topics.

Example:

```
oHH.ALinkLookUp(sSearch,sMsg,sTitle )!Find sSearch Alink
```

CloseHelp (close HTML help file)

CloseHelp

The **CloseHelp** method closes any Help windows opened by the application.

Example:

```
oHH.CloseHelp()!Close all Help windows
```

GetHelpFile (get help file name)

GetHelpFile

The **GetHelpFile** method retrieves the current HTML Help (.chm) file name. The file name is returned.

Return Data Type: STRING

Example:

```
sHelpFileName =oHH.GetHelpFile()!Get Help file name
```

GetTopic (get current topic name)

GetTopic

The **GetTopic** method retrieves the current HTML Help topic name. The topic name is returned.

Return Data Type: STRING

Example:

```
sHelpFileName =oHH.GetTopic()!Get topic name
```

Init (initialize HTML Help object)

Init(*helpfile*, **[***keycode***])**

AlinkLookup	Look up one or more Associative link (Alink) names within a compiled help (.chm) file.
helpfile	A string constant, variable, EQUATE, or expression containing the help file name. This should be enclosed in single quotes.
keycode	A numeric keycode or keycode EQUATE. If omitted, the default value is 123, F12Key. Keycode equates can be found in KEYCODES.CLW.

The **Init** method initializes the TagHTMLHelp object and opens the specified help file. This method also aliases the F1 key to the F12 (keycode 123) key by default in order for the rest of the methods to be able to check for this keystroke. If F12 is used by some other function in the application this may be changed to whatever keystroke is unused in the application.

Example:

```
oHH.Init( 'cwhh.chm' )
```

Return Data Type: BYTE

KeyWordLookup (lookup keyword)

KeyWordLookup(*keywords***, |** *messagetext***,** *messagetitle* **|)**

KeyWordLookup	Look up one or more keywords.
keywords	A string constant, variable, EQUATE, or expression containing the Associative link (*keyword*)to search for. Multiple keywords can be used by concatenating them with semicolons (;).
messagetext	A string constant, variable, EQUATE, or expression containing the message to display in a message box if the Alink is not found.
messagetitle	A string constant, variable, EQUATE, or expression containing the title of the message box dialog.

The **KeyWordLookup** method looks up Keywords within a compiled help (.chm) file. Keywords are a collection of words and phrases that make up the help file's index. They are used to find specific help topics.

Example:

```
oHH.KeyWordLookUp( 'Demo' )
```

Kill (shutdown the TagHTMLHelp object)

Kill

The **Kill** method shuts down the TagHTMLHelp object by freeing any memory used during the life of the object.

Example:

```
oHH.Kill()
```

Return Data Type: BYTE

SetHelpFile (set the current HTML Help file name)

SetHelpFile(*helpfile***)**

SetHelpFile	Set the HTML Help file name.
helpfile	A string constant, variable, EQUATE, or expression containing the help file name. This should be enclosed in single quotes.

The **SetHelpFile** method sets the name of the current compiled HTML help file (.chm) that the application will use

Example:

```
oHH.SetHelpFile('Demo.chm ' ) !Set help file name for application
```

SetTopic (set the current HTML Help file topic)

SetTopic(| *iControl* **|,** *topic***)**

SetTopic	Set the HTML Help file topic.
control	An integer constant, variable, EQUATE, or expression containing the control number (FEQ).
topic	A string constant, variable, EQUATE, or expression containing a help file topic. This should be enclosed in single quotes.

The **SetTopic** method sets the current topic name. This should be set before displaying the topic. To tie a help topic to load when a specific control has focus, specify an optional *control* value. To specify a help topic use the 'SectionName/PageName.htm' naming convention. If the topic page is in the default section you simply use 'PageName.htm'. Remember that when using the Section/Page convention, the slash is a forward slash.

Example:

```
oHH.SetTopic( 'Class_Interface/Class_Interface.htm' )
oHH.SetTopic( ?OKButton, 'myform/ok.htm') ).
```

ShowIndex (open the HTML Help index tab)

ShowIndex(*keyword***)**

ShowIndex	Open HTML Help index tab.
keyword	A string constant, variable, EQUATE, or expression containing the keyword to search for. The keyword should be enclosed in single quotes.

The **ShowIndex** method opens the Index tab in the Navigation pane of the HTML Help Viewer and searches for the keyword, if specified.

Example:

```
oHH.ShowIndex()!Opens Index tab
oHH.ShowIndex('Demo ' ))!Opens Index tab and searches for keyword
```

ShowSearch (open the HTML Help search tab)

ShowSearch

The **ShowSearch** method opens the Search tab in the Navigation pane of the HTML Help Viewer.

Example:

```
oHH.ShowSearch()
```

ShowTOC (open the HTML Help contents tab)

ShowTOC

The **ShowTOC** method opens the Contents tab in the Navigation pane of the HTML Help Viewer.

Example:

```
oHH.ShowTOC()
```

ShowTopic (display a help topic)

ShowTopic(*topic***)**

ShowTopic	Display the HTML Help file topic.
topic	A string constant, variable, EQUATE, or expression containing a help file topic. This should be enclosed in single quotes.

The **ShowTopic** method displays the help topic specified by the SetTopic method. If a *topic* is specified it will override the current topic name, however after the call to display the topic, the default topic name is still the default. This method does not change the default topic name.

Example:

```
oHH.ShowTopic()
```

TextWindowClass

TextWindowClass Overview

The TextWindowClass is a Class that manages a Window that is used for the editing of EIP memo and large string fields.

TextWindowClass Concepts

The TextWindowCkass manages a window (TxtWindow) that is defined in ABEIP.CLW. This window contains a TEXT control along with OK and Cancel buttons.

Relationship to Other Application Builder Classes

The TextWindowClass is derived from the WindowManager class. It manages the opening and closing of a special text window. This text window is where the memo or large string can be edited. The class also provides a method to handle the OK and Cancel buttons.

The TextWindowClass is instantiated within the EditTextClass.TakeEvent method. When the user presses the ellipsis button to edit the text, the special window is initiated.

ABC Template Implementation

If the EditTextClass is used to allow special Edit-in-Place editing of memos or large string fields, the TextWindow class is automatically generated. This class manages the window that opens when the user presses the ellipsis button on the special EIP Combo control.

TextWindowClass Source Files

The TextWindowClass source code is installed by default to the Clarion \LIBSRC folder. The specific TextWindowClass source code and their respective components are contained in:

ABEIP.INC	TextWindowClass declarations
ABEIP.CLW	TextWindowClass method definitions

TextWindowClass Properties

The TextWindowClass inherits all the properties of the WindowManager from which it is derived.

In addition to the inherited properties, the TextWindowClass contains the following properties:

SelE (ending edit position)

SelE UNSIGNED, AUTO

The **SelE** property identifies the ending edit position (character) in a TEXT control.

Implementation: The SelE property value is initialized in the TextWindowClass.Init method.

See Also: TextWindowClass.Init

SelS (starting edit position)

SelS UNSIGNED, AUTO

The **SelS** property identifies the starting edit position (character) in a TEXT control.

Implementation: The SelS property value is initialized in the TextWindowClass.Init method.

See Also: TextWindowClass.Init

Txt (field equate number)

Txt ANY, AUTO

The **Txt** property is the field equate number (FEQ) of the TEXT control holding the data available for edit.

Implementation: The Txt property is initialized in the TextWindowClass.Init method.

See Also: TextWindowClass.Init

TextWindowClass Methods

The TextWindowClass inherits all the methods of the WindowManager class from which it is derived.

In addition to (or instead of) the inherited methods, the TextWindowClass contains the following methods:

Init (initalize TextWindow object)

Init(| *entryFEQ, title* **|)**
Init, DERIVED, PROC

Init	Initializes and opens the special Text window.
entryFEQ	An integer constant, variable, EQUATE, or expression that represents the field number (FEQ) of the text control.
title	A string constant, variable, EQUATE, or expression that sets the title bar text in the dialog containing the text control.

The **Init** method initializes and opens the special Text window. A Level:Benign is returned from this method.

Implementation: The EditTextClass.TakeEvent method calls the TextWindowClass.Init method and initiates the ACCEPT loop for the text window.

Return Data Type: BYTE for Init, DERIVED, PROC prototype

See Also: EditTextClass.TakeEvent

Kill (shutdown TextWindow object)

Kill, DERIVED, PROC

The **Kill** method closes the Text window and updates the control with the new value. It also disposes any memory allocated during the object's lifetime by calling the PARENT.KILL method. KILL returns a value to indicate the status of the shutdown.

Return Data Type: BYTE

TakeAccepted (process window controls)

TakeAccepted, PROC, DERIVED

The **TakeAccepted** method processes EVENT:Accepted for the OK and Cancel button controls. TakeAccepted returns Level:Benign to indicate processing of this event should continue normally; Level:Notify is returned to indicate processing is complete for this event and the ACCEPT loop should CYCLE; Level:Fatal is returned to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeAccepted method calls the WindowManager.SetResponse to register the methods' result (complete or cancelled) and triggers the normal procedure shutdown.

Return Data Type: BYTE

See Also: WindowManager.SetReponse

ToolbarClass

ToolbarClass Overview

ToolbarClass and ToolbarTarget objects work together to reliably "convert" an event associated with a toolbar button into an appropriate event associated with a specific control or window.

ToolbarClass objects communicate with zero or more ToolbarTarget objects. Each ToolbarTarget object is associated with a specific entity, such as a browse list, relation tree,or update form. The ToolbarClass object forwards events and method calls to the *active* ToolbarTarget object. Only one target is active at a time.

This lets you use a single toolbar to drive a variety of targets, such as update forms, browse lists, relation tree lists, etc. A single toolbar can even drive multiple targets (two or more BrowseBoxes) in a single procedure.

ToolbarClass Concepts

Within an MDI application, the ToolbarClass and ToolbarTarget work together to reliably interpret and pass an event (EVENT:Accepted) associated with a toolbar button into an event associated with a specific control or window. For example, the end user CLICKS on a toolbar button (say the "Insert" button) on the MDI application frame. The frame procedure forwards the event to the active thread (**`POST(EVENT:Accepted,ACCEPTED(),SYSTEM{Prop:Active})`**). The active thread (procedure) manages a window that displays two LIST controls, and one of the LISTs has focus. This procedure has a ToolbarClass object plus a ToolbarTarget object for each LIST control. The ToolbarClass object takes the event (ToolbarClass.TakeEvent)[1] and forwards the event to the *active* ToolbarTarget object (the target that represents the LIST with focus). The ToolbarTarget object takes the event (ToolbarListBoxClass.TakeEvent) and handles it by posting an appropriate event to a specific control or to the window, for example:

```
POST(EVENT:ACCEPTED,SELF.InsertButton) !insert a record
POST(EVENT:PageDown,SELF.Control)      !scroll a LIST
POST(EVENT:Completed)                  !complete an update form
POST(EVENT:CloseWindow)                !select a record
etc.
```

[1]If the procedure has a WindowManager object, the WindowManager object takes the event (WindowManager.TakeEvent) and forwards it to the ToolbarClass object (WindowManager.TakeAccepted).

ToolbarClass Relationship to Other Application Builder Classes

ToolbarTarget

The ToolbarClass object keeps a list of ToolbarTarget objects so it can forward events and method calls to a particular target. Each ToolbarTarget object is associated with a specific entity,

such as a browse list, relation tree,or update form. At present, the ABC Library has three classes derived from the ToolbarTarget:

ToolbarListboxClass	BrowseClass toolbar target
ToolbarReltreeClass	Reltree control toolbar target
ToolbarUpdateClass	Form procedure toolbar target

These ToolbarTarget objects implement the event handling specific to the associated entity. There may be zero or more ToolbarTarget objects within a procedure; however, *only one is active* at a time. The SetTarget method sets the active ToolbarTarget object.

BrowseClass and WindowManager

The WindowManager optionally uses the ToolbarClass, as does the BrowseClass. Therefore, if your program uses a WindowManager or BrowseClass object, it may also need the ToolbarClass. Much of this is automatic when you INCLUDE the WindowManager or BrowseClass headers (ABWINDOW.INC and ABBROWSE.INC) in your program's data section. See the Conceptual Example.

ToolbarClass ABC Template Implementation

The ABC procedure templates instantiate a ToolbarClass object called Toolbar within each procedure containing a template that asks for global toolbar control--that is, the BrowseBox template, the FormVCRControls template, and the RelationTree template.

The templates generate code to instantiate the ToolbarClass object and to register the ToolbarClass object with the WindowManager object. You may see code such as the following in your template-generated procedures.

```
Toolbar    ToolbarClass      !declare Toolbar object
 CODE
 !
ThisWindow.Init PROCEDURE
 SELF.AddItem(Toolbar)                     !register Toolbar with WindowManager
 BRW1.AddToolbarTarget(Toolbar)            !register BrowseClass as target
 Toolbar.AddTarget(REL1::Toolbar,?RelTree) !register RelTree as target
 SELF.AddItem(ToolbarForm)                 !register update form as target
```

The WindowManager and BrowseClass are both programmed to use ToolbarClass objects. Therefore most of the interaction between these objects is encapsulated within the Application Builder Class code, and is only minimally reflected in the ABC Template generated code.

Toolbar Class Source Files

The ToolbarClass source code is installed by default to the Clarion \LIBSRC folder. The ToolbarClass source code and its respective components are contained in:

ABTOOLBA.INC	ToolbarClass declarations
ABTOOLBA.CLW	ToolbarClass method definitions

ToolbarClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a ToolbarClass object and related ToolbarTarget objects.

This example uses the ToolbarClass to allow a global toolbar to drive two separate but related LISTs within a single MDI procedure. The primary LIST shows client information and the related LIST shows phone numbers for the selected client. The toolbar drives whichever list has focus.

The program POSTs toolbar events to the active MDI window using the SYSTEM{Prop:Active} property. Then the local ToolbarClass object calls on the active ToolbarTarget object to handle the event.

```
 PROGRAM

 INCLUDE('ABBROWSE.INC')         !declare BrowseClass
 INCLUDE('ABTOOLBA.INC')         !declare Toolbar classes
 INCLUDE('ABWINDOW.INC')         !declare WindowManager
 CODE
 !program code

Main PROCEDURE                   !contains global toolbar
AppFrame APPLICATION('Toolbars'),AT(,,275,175),SYSTEM,MAX,RESIZE,IMM
 MENUBAR
  ITEM('Browse Customers'),USE(?BrowseCustomer)
 END
 TOOLBAR,AT(0,0,400,22)        !must use ABTOOLBA.INC EQUATES:
 BUTTON,AT(4,2),USE(?Top,Toolbar:Top),DISABLE,ICON('VCRFIRST.ICO'),FLAT
 BUTTON,AT(16,2),USE(?PageUp,Toolbar:PageUp),DISABLE,ICON('VCRPRIOR.ICO'),FLAT
 BUTTON,AT(28,2),USE(?Up,Toolbar:Up),DISABLE,ICON('VCRUP.ICO'),FLAT
 BUTTON,AT(40,2),USE(?Down,Toolbar:Down),DISABLE,ICON('VCRDOWN.ICO'),FLAT
 BUTTON,AT(52,2),USE(?PageDown,Toolbar:PageDown),DISABLE,ICON('VCRNEXT.ICO'),FLAT
 BUTTON,AT(64,2),USE(?Bottom,Toolbar:Bottom),DISABLE,ICON('VCRLAST.ICO'),FLAT
 END
END

Frame        CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeAccepted PROCEDURE(),BYTE,PROC,VIRTUAL
             END
Toolbar   ToolbarClass             !declare Toolbar object
 CODE
 Frame.Run()

Frame.Init  PROCEDURE()
ReturnValue  BYTE,AUTO
 CODE
```

```
 ReturnValue = PARENT.Init()
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(Toolbar)            !register Toolbar with WindowManager
 OPEN(AppFrame)
 SELF.Opened=True
 SELF.SetAlerts()
 RETURN ReturnValue
Frame.TakeAccepted PROCEDURE()
ReturnValue     BYTE,AUTO
Looped       BYTE
 CODE
 LOOP
  IF Looped THEN RETURN Level:Notify ELSE Looped=1.
  CASE ACCEPTED()
  OF Toolbar:First TO Toolbar:Last                     !for EVENT:Accepted on toolbar
   POST(EVENT:Accepted,ACCEPTED(),SYSTEM{Prop:Active}) !transfer it to active thread
   CYCLE                                              ! and stop
  END
  ReturnValue = PARENT.TakeAccepted()
  IF ACCEPTED() = ?BrowseCustomer
   START(BrowseCustomer,050000)
  END
  RETURN ReturnValue
 END

BrowseCustomer PROCEDURE          !contains local Toolbar and targets
CusView   VIEW(Customer)
          END
CusQ        QUEUE
CUS:CUSTNO   LIKE(CUS:CUSTNO)
CUS:NAME     LIKE(CUS:NAME)
ViewPosition STRING(512)
            END
PhView    VIEW(Phones)
          END
PhQ         QUEUE
PH:NUMBER    LIKE(PH:NUMBER)
PH:ID        LIKE(PH:ID)
ViewPosition STRING(512)
            END
```

```
CusWindow WINDOW('Browse Customers'),AT(,,246,131),IMM,SYSTEM,GRAY,MDI
       LIST,AT(8,7,160,100),USE(?CusList),IMM,HVSCROLL,FROM(CusQ),|
        FORMAT('51R(2)|M~CUSTNO~C(0)@n-14@80L(2)|M~NAME~@s30@')
       BUTTON('&Insert'),AT(17,111,45,14),USE(?InsertCus),SKIP
       BUTTON('&Change'),AT(66,111,45,14),USE(?ChangeCus),SKIP,DEFAULT
       BUTTON('&Delete'),AT(115,111,45,14),USE(?DeleteCus),SKIP
       LIST,AT(176,7,65,100),USE(?PhList),IMM,FROM(PhQ),FORMAT('80L~Phones~L(1)')
       BUTTON('&Insert'),AT(187,41,42,12),USE(?InsertPh),HIDE
       BUTTON('&Change'),AT(187,54,42,12),USE(?ChangePh),HIDE
       BUTTON('&Delete'),AT(187,67,42,12),USE(?DeletePh),HIDE
      END
ThisWindow  CLASS(WindowManager)         !declare ThisWindow object
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeSelected PROCEDURE(),BYTE,PROC,VIRTUAL
            END
Toolbar   ToolbarClass              !declare Toolbar object to receive
                                    ! and process toolbar events from Main
CusBrowse  CLASS(BrowseClass)       !declare CusBrowse object
Q          &CusQ
           END
PhBrowse   CLASS(BrowseClass)       !declare PhBrowse object
Q          &PhQ
           END
 CODE
 ThisWindow.Run()

ThisWindow.Init PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?CusList          !CusList gets initial focus
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(Toolbar)               !register Toolbar with WindowManager
 Relate:Customer.Open
 CusBrowse.Init(?CusList,CusQ.ViewPosition,CusView,CusQ,Relate:Customer,SELF)
 PhBrowse.Init(?PhList,PhQ.ViewPosition,PhView,PhQ,Relate:Phones,SELF)
 OPEN(CusWindow)
 SELF.Opened=True
 CusBrowse.Q &= CusQ
 CusBrowse.AddSortOrder(,CUS:BYNUMBER)
 CusBrowse.AddField(CUS:CUSTNO,CusBrowse.Q.CUS:CUSTNO)
 CusBrowse.AddField(CUS:NAME,CusBrowse.Q.CUS:NAME)
 PhBrowse.Q &= PhQ
 PhBrowse.AddSortOrder(,PH:IDKEY)
 PhBrowse.AddRange(PH:ID,Relate:Phones,Relate:Customer)
 PhBrowse.AddField(PH:NUMBER,PhBrowse.Q.PH:NUMBER)
```

```
 PhBrowse.AddField(PH:ID,PhBrowse.Q.PH:ID)
 CusBrowse.InsertControl=?InsertCus
 CusBrowse.ChangeControl=?ChangeCus
 CusBrowse.DeleteControl=?DeleteCus
 CusBrowse.AddToolbarTarget(Toolbar)       !Make CusBrowse a toolbar target
 PhBrowse.InsertControl=?InsertPh
 PhBrowse.ChangeControl=?ChangePh
 PhBrowse.DeleteControl=?DeletePh
 PhBrowse.AddToolbarTarget(Toolbar)        !Make PhBrowse a toolbar target
 SELF.SetAlerts()
 RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 Relate:Customer.Close
 RETURN ReturnValue

ThisWindow.TakeSelected  PROCEDURE()
ReturnValue          BYTE,AUTO
Looped             BYTE
 CODE
 LOOP
 IF Looped THEN RETURN Level:Notify ELSE Looped=1.
  ReturnValue = PARENT.TakeSelected()
  CASE FIELD()
   OF ?CusList                         !if selected,
    Toolbar.SetTarget(?CusList)        ! make ?CusList the active target
   OF ?PhList                          !if selected
    IF RECORDS(PhBrowse.Q) > 1         !and contains more than one record,
     Toolbar.SetTarget(?PhList)        ! make ?PhList the active target
    END
  END
  RETURN ReturnValue
 END
```

ToolbarClass Methods

The ToolbarClass contains the methods listed below.

ToolbarClass Functional Organization--Expected Use

As an aid to understanding the ToolbarClass, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ToolbarClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into two categories:

Housekeeping (one-time) Use:

Init	initialize the ToolbarClass object
AddTarget	register toolbar driven entity
Kill[v]	shut down the ToolbarClass object

Mainstream Use:

SetTarget	set active target & appropriate toolbar state
TakeEvent[v]	process toolbar event for active target

Occasional Use:

DisplayButtons[v]	enable appropriate toolbar buttons

[v] These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--other base class methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

DisplayButtons	enable appropriate toolbar buttons
TakeEvent	process toolbar event for active target
Kill	shut down the ToolbarClass object

AddTarget (register toolbar driven entity)

AddTarget(*target, control* **)**

AddTarget	Adds a toolbar target to the ToolbarClass object's list of potential toolbar targets.
target	The label of a ToolbarTarget object.
control	An integer constant, variable, EQUATE, or expression containing the *target*'s ID number. For targets associated with a control, this is the control number (usually represented by the control's Field Equate Label).

The **AddTarget** method adds a toolbar target (ToolbarTarget object) to the ToolbarClass object's list of potential toolbar targets.

The last added target is the active target until supplanted by a subsequent call to AddTarget or SetTarget.

Example:

```
CODE
Toolbar.Init                                    !initialize Toolbar object
ToolBar.AddTarget( ToolBarForm, -1 )            !register an Update Form target
Toolbar.AddTarget( REL1::Toolbar, ?RelTree )!register a RelTree target
BRW1.AddToolbarTarget( Toolbar )                !register a BrowseBox target...
                                                !BrowseClass method calls AddTarget
```

See Also: SetTarget

DisplayButtons (enable appropriate toolbar buttons:ToolbarClass)

DisplayButtons, VIRTUAL

The **DisplayButtons** method enables and disables the appropriate toolbar buttons for the active toolbar target.

The SetTarget method sets the active toolbar target.

Implementation: The DisplayButtons method calls the ToolbarTarget.DisplayButtons method for the active toolbar target.

Example:

```
CODE
Toolbar.Init                            !initialize Toolbar object
 ToolBar.AddTarget( ToolBarForm, -1 )   !register an Update Form target
 Toolbar.DisplayButtons                 !and enable appropriate toolbar buttons
                                        !for that target
```

See Also: SetTarget

Init (initialize the ToolbarClass object)

Init

The **Init** method initializes the ToolbarClass object.

Implementation: The Init method allocates a new list of potential toolbar targets.

Example:

```
CODE
Toolbar.Init                    !initialize Toolbar object
!program code
ACCEPT
!program code
END
Toolbar.Kill                    !shut down Toolbar object
```

Kill (shut down the ToolbarClass object)

Kill, VIRTUAL

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Implementation: The Kill method disposes of the list of potential toolbar targets.

Example:

```
CODE
Toolbar.Init                    !initialize Toolbar object
!program code
ACCEPT
!program code
END
Toolbar.Kill                    !shut down Toolbar object
```

SetTarget (sets the active target)

SetTarget([*ID*] **)**

SetTarget Sets the ToolbarClass object's active toolbar target.

ID An integer constant, variable, EQUATE, or expression containing the *target*'s ID number. For targets associated with a control, this is the control number (usually represented by the control's Field Equate Label). If omitted or zero (0), SetTarget sets the most likely target.

The **SetTarget** method sets the ToolbarClass object's active toolbar target (ToolbarTarget object), and adjusts the TOOLBAR state appropriate to that target.

Implementation: The SetTarget method calls the ToolbarTarget.TakeToolbar or ToolbarTarget.TryTakeToolbar method to set the toolbar buttons' TIP attributes and enabled/disabled status appropriate to the active toolbar target.

Example:

```
ACCEPT
 CASE EVENT()
 OF EVENT:OpenWindow                !on open window
  DO RefreshWindow                  !load the browse QUEUEs
 OF EVENT:Accepted                  !for Accepted events (which may
  CASE FOCUS()                      ! come from the global toolbar)
  OF ?ClientList                    ! make the list with FOCUS
   Toolbar.SetTarget(?ClientList)   ! the active toolbar target
  OF ?PhoneList                     ! and enable appropriate toolbar
   Toolbar.SetTarget(?PhoneList)    ! buttons and TIP attributes
  END
  Toolbar.TakeEvent(VCRRequest, WM)!the Toolbar object calls the
 END                                ! active target's event handler
END                                 ! which in turn scrolls, inserts,
                                    ! deletes, helps, etc. The event
                                    ! handler often simply POSTs
                                    ! another event to the correct
                                    ! control, e.g.
                                    ! Event:Accepted to ?Insert  or
                                    ! Event:PageUp to ?ClientList
```

See Also: ToolbarTarget.TakeToolbar, ToolbarTarget.TryTakeToolbar

TakeEvent (process toolbar event:ToolbarClass)

TakeEvent([*vcr*], *window manager* **), VIRTUAL**

TakeEvent Processes toolbar events for the active toolbar target.

vcr An integer variable to receive the control number of the accepted VCR navigation button. This lets the TakeEvent method specify an appropriate subsequent action. If omitted, the ToolbarTarget object does no "post processing" navigation.

Windowmanager
The label of the ToolbarTarget object's WindowManager object. See *Window Manager* for more information.

The **TakeEvent** method processes toolbar events for the active toolbar target (ToolbarTarget object).

The *vcr* parameter lets the TakeEvent method specify an appropriate subsequent or secondary action. For example, the ToolbarUpdateClass.TakeEvent method (for a FORM), may interpret a vcr scroll down as "save and then scroll." The method takes the necessary action to save the item and accomplishes the secondary scroll action by setting the *vcr* parameter.

The SetTarget method sets the active toolbar target.

Implementation: The WindowManager.TakeEvent method calls the TakeEvent method. The TakeEvent method calls the ToolbarTarget.TakeEvent method for the active toolbar target.

Example:

```
MyWindowManager.TakeAccepted PROCEDURE
  CODE
  IF ~SELF.Toolbar &= NULL
    SELF.Toolbar.TakeEvent(SELF.VCRRequest,SELF)
  END
 !procedure code
```

See Also: SetTarget, WindowManager.TakeEvent

ToolbarListBoxClass

ToolbarListBoxClass Overview

The ToolbarListBoxClass is a ToolbarTarget that handles events for a BrowseClass LIST. See BrowseClass and Control Templates--BrowseBox for more information.

ToolbarListboxClass Concepts

ToolbarListBoxClass objects implement the event handling specific to a BrowseClass LIST. The LIST specific events are primarily scrolling events, but also include the event to select a single list item (EVENT:Accepted for a Select button). There may be zero or several ToolbarTarget objects within a procedure; however, *only one is active* at a time.

ToolbarListBoxClass Relationship to Other Application Builder Classes

The ToolbarListboxClass is derived from the ToolbarTarget class.

The ToolbarClass keeps a list of ToolbarTarget objects (including ToolbarListboxClass objects) so it can forward events and method calls to a particular target.

ToolbarListBoxClass ABC Template Implementation

The ToolbarListboxClass is completely encapsulated within the BrowseClass and is not referenced in the template-generated code.

ToolbarListboxClass Source Files

The ToolbarListboxClass source code is installed by default to the Clarion \LIBSRC folder. The ToolbarListboxClass source code and its respective components are contained in:

ABTOOLBA.INC	ToolbarListboxClass declarations
ABTOOLBA.CLW	ToolbarListboxClass method definitions

ToolbarListBoxClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a ToolbarClass object and related ToolbarListboxClass objects.

This example uses a global toolbar to drive two separate but related LISTs within a single MDI procedure. The primary LIST shows client information and the related LIST shows phone numbers for the selected client. The toolbar drives whichever list has focus. See also *ToolbarUpdateClass--Conceptual Example*.

The program POSTs toolbar events to the active MDI window using the SYSTEM{Prop:Active} property. Then the local ToolbarClass object calls on the active ToolbarTarget object to handle the event.

```
 PROGRAM
 INCLUDE('ABBROWSE.INC')                !declare BrowseClass
 INCLUDE('ABTOOLBA.INC')                !declare Toolbar classes
 INCLUDE('ABWINDOW.INC')                !declare WindowManager
 CODE
 !program code

Main PROCEDURE                        !contains global toolbar
AppFrame APPLICATION('Toolbars'),AT(,,275,175),SYSTEM,MAX,RESIZE,IMM
       MENUBAR
        ITEM('Browse Customers'),USE(?BrowseCustomer)
       END
       TOOLBAR,AT(0,0,400,22)           !must use ABTOOLBA.INC EQUATES:
 BUTTON,AT(4,2),USE(?Top,Toolbar:Top),DISABLE,ICON('VCRFIRST.ICO'),FLAT
 BUTTON,AT(16,2),USE(?PageUp,Toolbar:PageUp),DISABLE,ICON('VCRPRIOR.ICO'),FLAT
 BUTTON,AT(28,2),USE(?Up,Toolbar:Up),DISABLE,ICON('VCRUP.ICO'),FLAT
 BUTTON,AT(40,2),USE(?Down,Toolbar:Down),DISABLE,ICON('VCRDOWN.ICO'),FLAT
 BUTTON,AT(52,2),USE(?PageDown,Toolbar:PageDown),DISABLE,ICON('VCRNEXT.ICO'),FLAT
 BUTTON,AT(64,2),USE(?Bottom,Toolbar:Bottom),DISABLE,ICON('VCRLAST.ICO'),FLAT
      END
     END
Frame        CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeAccepted PROCEDURE(),BYTE,PROC,VIRTUAL
             END
Toolbar   ToolbarClass             !declare Toolbar object
 CODE
 Frame.Run()

Frame.Init  PROCEDURE()
ReturnValue  BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(Toolbar)              !register Toolbar with WindowManager
 OPEN(AppFrame)
 SELF.Opened=True
 SELF.SetAlerts()
 RETURN ReturnValue

Frame.TakeAccepted PROCEDURE()
ReturnValue  BYTE,AUTO
Looped       BYTE
```

```
 CODE
  CASE ACCEPTED()
  OF Toolbar:First TO Toolbar:Last      !for EVENT:Accepted on toolbar
   POST(EVENT:Accepted,ACCEPTED(),SYSTEM{Prop:Active}) !transfer it to active thread
   RETURN Level:Notify
  OF ?BrowseCustomer
   START(BrowseCustomer,050000)
  END
  RETURN PARENT.TakeAccepted()


BrowseCustomer PROCEDURE             !contains local Toolbar and targets
CusView   VIEW(Customer)
          END
CusQ        QUEUE
CUS:CUSTNO   LIKE(CUS:CUSTNO)
CUS:NAME     LIKE(CUS:NAME)
ViewPosition STRING(512)
            END
PhView   VIEW(Phones)
         END
PhQ         QUEUE
PH:NUMBER    LIKE(PH:NUMBER)
PH:ID        LIKE(PH:ID)
ViewPosition STRING(512)
            END
CusWindow WINDOW('Browse Customers'),AT(,,246,131),IMM,SYSTEM,GRAY,MDI
           LIST,AT(8,7,160,100),USE(?CusList),IMM,HVSCROLL,FROM(CusQ),|
           FORMAT('51R(2)|M~CUSTNO~C(0)@n-14@80L(2)|M~NAME~@s30@')
           BUTTON('&Insert'),AT(17,111,45,14),USE(?InsertCus),SKIP
           BUTTON('&Change'),AT(66,111,45,14),USE(?ChangeCus),SKIP,DEFAULT
           BUTTON('&Delete'),AT(115,111,45,14),USE(?DeleteCus),SKIP
           LIST,AT(176,7,65,100),USE(?PhList),IMM,FROM(PhQ),|
           FORMAT('80L~Phones~L(1)@s20@')
           BUTTON('&Insert'),AT(187,41,42,12),USE(?InsertPh),HIDE
           BUTTON('&Change'),AT(187,54,42,12),USE(?ChangePh),HIDE
           BUTTON('&Delete'),AT(187,67,42,12),USE(?DeletePh),HIDE
          END

ThisWindow  CLASS(WindowManager)         !declare ThisWindow object
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeSelected PROCEDURE(),BYTE,PROC,VIRTUAL
            END
Toolbar   ToolbarClass                   ! declare Toolbar object to receive
                                         ! and process toolbar events from Main
CusBrowse  CLASS(BrowseClass)            !declare CusBrowse object
Q          &CusQ
```

```
          END
PhBrowse  CLASS(BrowseClass)           !declare PhBrowse object
Q         &PhQ
          END
 CODE
 ThisWindow.Run()

ThisWindow.Init  PROCEDURE()
ReturnValue     BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?CusList            !CusList gets initial focus
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  SELF.AddItem(Toolbar)                !register Toolbar with WindowManager
  Relate:Customer.Open
  CusBrowse.Init(?CusList,CusQ.ViewPosition,CusView,CusQ,Relate:Customer,SELF)
  PhBrowse.Init(?PhList,PhQ.ViewPosition,PhView,PhQ,Relate:Phones,SELF)
  OPEN(CusWindow)
  SELF.Opened=True
  CusBrowse.Q &= CusQ
  CusBrowse.AddSortOrder(,CUS:BYNUMBER)
  CusBrowse.AddField(CUS:CUSTNO,CusBrowse.Q.CUS:CUSTNO)
  CusBrowse.AddField(CUS:NAME,CusBrowse.Q.CUS:NAME)
  PhBrowse.Q &= PhQ
  PhBrowse.AddSortOrder(,PH:IDKEY)
  PhBrowse.AddRange(PH:ID,Relate:Phones,Relate:Customer)
  PhBrowse.AddField(PH:NUMBER,PhBrowse.Q.PH:NUMBER)
  PhBrowse.AddField(PH:ID,PhBrowse.Q.PH:ID)
  CusBrowse.InsertControl=?InsertCus
  CusBrowse.ChangeControl=?ChangeCus
  CusBrowse.DeleteControl=?DeleteCus
  CusBrowse.AddToolbarTarget(Toolbar)       !Make CusBrowse a toolbar target
  PhBrowse.InsertControl=?InsertPh
  PhBrowse.ChangeControl=?ChangePh
  PhBrowse.DeleteControl=?DeletePh
  PhBrowse.AddToolbarTarget(Toolbar)        !Make PhBrowse a toolbar target
  SELF.SetAlerts()
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()
  Relate:Customer.Close
  RETURN ReturnValue

ThisWindow.TakeSelected  PROCEDURE()
```

```
ReturnValue        BYTE,AUTO
 CODE
 ReturnValue = PARENT.TakeSelected()
 CASE FIELD()
 OF ?CusList                                !if selected,
  Toolbar.SetTarget(?CusList)               ! make ?CusList the active target
 OF ?PhList                                 !if selected
  IF RECORDS(PhBrowse.Q) > 1                !and contains more than one record,
   Toolbar.SetTarget(?PhList)               ! make ?PhList the active target
  END
 END
 RETURN ReturnValue
```

ToolbarListboxClass Properties

The ToolbarListboxClass inherits all the properties of the ToolbarTarget from which it is derived. See *ToolbarTarget Properties* for more information.

In addition to its inherited properties, the ToolbarListboxClass contains the following properties.

Browse (BrowseClass object)

Browse &BrowseClass

The **Browse** property is a reference to the ToolbarListboxClass object's BrowseClass object. The ToolbarListboxClass object uses this property to access the BrowseClass object's properties and methods.

Implementation: The BrowseClass.AddToolbarTarget method sets the value of the Browse property.

The TryTakeToolbar method uses the Browse property to determine whether the associated LIST control is visible.

See Also: BrowseClass.AddToolbarTarget

ToolbarListboxClass Methods

The ToolbarListboxClass inherits all the methods of the ToolbarTarget from which it is derived. See *ToolbarTarget Methods* for more information.

In addition to (or instead of) the inherited methods, the ToolbarListboxClass contains the following methods:

DisplayButtons (enable appropriate toolbar buttons:ToolbarListboxClass)

DisplayButtons, VIRTUAL

The **DisplayButtons** method enables and disables the appropriate toolbar buttons for the ToolbarListboxClass object based on the values of the HelpButton, InsertButton, ChangeButton, DeleteButton, and SelectButton properties.

Implementation: The TakeToolbar method calls the DisplayButtons method. The DisplayButtons method calls the PARENT.DisplayButtons method (ToolbarTarget.DisplayButtons) to handle buttons common to all ToolbarTargets.

Example:

```
 CODE
 Toolbar.Init                          !initialize Toolbar object
  BRW1.AddToolbarTarget( Toolbar )     !register a BrowseBox target
  ToolBar.SetTarget( ?Browse:1)        !calls DisplayButtons via TakeToolbar

MyToolbarListboxClass.DisplayButtons PROCEDURE !a derived class virtual
 CODE
 DISABLE(Toolbar:History)              !disable toolbar ditto button
 ENABLE(Toolbar:Locate)                !enable locator button
 PARENT.DisplayButtons                 !call base class DisplayButtons
 !your custom code here
```

See Also: HelpButton, InsertButton, ChangeButton, DeleteButton, SelectButton, TakeToolbar, ToolbarTarget.DisplayButtons

TakeEvent (convert toolbar events:ToolbarListboxClass)

TakeEvent([*vcr*], *window manager* **), VIRTUAL**

TakeEvent Handles toolbar events for the ToolbarListboxClass object.

vcr An integer variable to receive the control number of the accepted vcr button. This lets the TakeEvent method specify an appropriate subsequent action. If omitted, the ToolbarListboxClass object does no "post processing" navigation.

windowmanager The label of the ToolbarListboxClass object's WindowManager object. See *Window Manager* for more information.

The **TakeEvent** method handles toolbar events for the ToolbarListboxClass object.

The *vcr* parameter lets the TakeEvent method specify an appropriate subsequent or secondary action. For example, the ToolbarListboxClass.TakeEvent method, may interpret a scroll down as "save and then scroll." The method takes the necessary action to save the item and accomplishes the secondary scroll action by setting the *vcr* parameter.

Implementation: The ToolbarClass.TakeEvent method calls the TakeEvent method for the active ToolbarTarget object. The ToolbarClass.SetTarget method sets the active ToolbarTarget object.

Example:

```
ToolbarClass.TakeEvent PROCEDURE(<*LONG VCR>,WindowManager WM)
  CODE
 ASSERT(~SELF.List &= NULL)
 IF RECORDS(SELF.List)
  SELF.List.Item.TakeEvent(VCR,WM)
 END
```

See Also: ToolbarClass.SetTarget, ToolbarClass.TakeEvent

TakeToolbar (assume contol of the toolbar)

TakeToolbar, VIRTUAL

The **TakeToolbar** method sets the toolbar state appropriate to the ToolbarListboxClass object.

Implementation: The TakeToolbar method sets appropriate TIP attributes for the toolbar buttons and enables and disables toolbar buttons appropriate for the ToolbarListboxClass object. The ToolbarClass.SetTarget method and the TryTakeToolbar method call the TakeToolbar method.

Example:

```
MyToolbarClass.SetTarget PROCEDURE(SIGNED Id)
I USHORT,AUTO
Hit USHORT
  CODE
    ASSERT(~ (SELF.List &= NULL))
    IF Id                       !set explicitly requested target
      SELF.List.Id = Id
      GET(SELF.List,SELF.List.Id)
      ASSERT (~ERRORCODE())
      SELF.List.Item.TakeToolbar
    ELSE                        !set any (last) valid target
      LOOP I = 1 TO RECORDS(SELF.List)
        GET(SELF.List,I)
        IF SELF.List.Item.TryTakeToolbar() THEN Hit = I.
      END
      IF Hit THEN GET(SELF.List,Hit).
    END
```

See Also: TryTakeToolbar, ToolbarClass.SetTarget

TryTakeToolbar (return toolbar control indicator:ToolbarListBoxClass)

TryTakeToolbar, VIRTUAL

The **TryTakeToolbar** method returns a value indicating whether the ToolbarTarget object successfully assumed control of the toolbar. A return value of one (1 or True) indicates success; a value of zero (0 or False) indicates failure to take control of the toolbar.

Implementation: The ToolbarClass.SetTarget method calls the TryTakeToolbar method. The TryTakeToolbar method calls the TakeToolbar method if the ToolbarListboxClass object's LIST is visible.

Return Data Type: BYTE

Example:

```
ToolbarClass.SetTarget PROCEDURE(SIGNED Id)
I USHORT,AUTO
Hit USHORT
  CODE
    ASSERT(~ (SELF.List &= NULL))
    IF Id                     !set explicitly requested target
      SELF.List.Id = Id
      GET(SELF.List,SELF.List.Id)
      ASSERT (~ERRORCODE())
      SELF.List.Item.TakeToolbar
    ELSE                      !set a valid target
      LOOP I = 1 TO RECORDS(SELF.List)
        GET(SELF.List,I)
        IF SELF.List.Item.TryTakeToolbar() THEN Hit = I.
      END
      IF Hit THEN GET(SELF.List,Hit).
    END
```

See Also: TakeToolbar, ToolbarClass.SetTarget

ToolbarReltreeClass

ToolbarReltreeClass Overview

The ToolbarReltreeClass is a ToolbarTarget that handles events for a RelationTree control LIST. See Control Templates--RelationTree for more information.

ToolbarReltreeClass Concepts

ToolbarReltreeClass objects implement the event handling specific to a RelationTree control LIST. The LIST specific events are primarily scrolling events, but may include other events. There may be zero or several ToolbarTarget objects within a procedure; however, *only one is active* at a time.

ToolbarReltreeClass Relationship to Other Application Builder Classes

The ToolbarReltreeClass is derived from the ToolbarTarget class.

The ToolbarClass keeps a list of ToolbarTarget objects (including ToolbarReltreeClass objects) so it can forward events and method calls to a particular target.

ToolbarReltreeClass ABC Template Implementation

The RelationTree control template derives a ToolbarReltreeClass object called REL#::Toolbar, where # is the RelationTree template's instance number. The template generates code to register the REL#::Toolbar object with the Toolbar object for the procedure that contains the RelationTree control template. Finally, the template generates the REL#::Toolbar.TakeEvent method to convert toolbar events into actions specific to the RelationTree LIST control.

Toolbar ToolbarReltreeClass Source Files

The ToolbarReltreeClass source code is installed by default to the Clarion \LIBSRC folder. The source code and its respective components are in:

ABTOOLBA.INC	ToolbarReltreeClass declarations
ABTOOLBA.CLW	ToolbarReltreeClass method definitions

ToolbarReltreeClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a ToolbarClass object and a related ToolbarReltreeClass (ToolbarTarget) object.

This example uses a global toolbar to drive a template generated RelTree control. The program POSTs toolbar events to the active MDI window using the SYSTEM{Prop:Active} property. Then the ToolbarClass object calls on the active ToolbarReltreeClass object to handle the (scrolling) events.

```
 PROGRAM

_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)
 INCLUDE('ABERROR.INC')
 INCLUDE('ABFILE.INC')
 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABTOOLBA.INC')
 INCLUDE('KEYCODES.CLW')

 MAP
Main      PROCEDURE
OrderTree   PROCEDURE
 END
GlobalErrors  ErrorClass
Access:Customer CLASS(FileManager)
Init            PROCEDURE
                END

Relate:Customer CLASS(RelationManager)
Init            PROCEDURE
Kill            PROCEDURE,VIRTUAL
                END

Access:Orders  CLASS(FileManager)
Init           PROCEDURE
               END

Relate:Orders  CLASS(RelationManager)
Init           PROCEDURE
Kill           PROCEDURE,VIRTUAL
               END
GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest    LONG(0),THREAD
```

```
Customer       FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,BINDABLE,THREAD
KeyCustNumber   KEY(CUS:CustNumber),NOCASE,OPT
KeyCompany      KEY(CUS:Company),DUP,NOCASE
Record          RECORD,PRE()
CustNumber       LONG
Company          STRING(20)
ZipCode          LONG
                 END
                END

Orders         FILE,DRIVER('TOPSPEED'),PRE(ORD),CREATE,BINDABLE,THREAD
KeyOrderNumber  KEY(ORD:OrderNumber),NOCASE,OPT,PRIMARY
KeyCustNumber   KEY(ORD:CustNumber),DUP,NOCASE,OPT
Record          RECORD,PRE()
CustNumber       LONG
OrderNumber      SHORT
InvoiceAmount    DECIMAL(7,2)
                 END
                END
 CODE
 GlobalErrors.Init
 Relate:Customer.Init
 Relate:Orders.Init
 Main                       !run Application Frame w/ toolbar
 Relate:Customer.Kill
 Relate:Orders.Kill
 GlobalErrors.Kill

Main PROCEDURE              !Application Frame w/ toolbar
Frame APPLICATION('Application'),AT(,,310,210),SYSTEM,MAX,RESIZE,IMM
    MENUBAR
     ITEM('Orders'),USE(?OrderTree)
    END
    TOOLBAR,AT(0,0,,20)    !must use toolbar EQUATEs
   BUTTON,AT(4,4),USE(?Toolbar:Top,Toolbar:Top),DISABLE,ICON('VCRFIRST.ICO')
   BUTTON,AT(16,4),USE(?Toolbar:PageUp,Toolbar:PageUp),DISABLE,ICON('VCRPRIOR.ICO')
   BUTTON,AT(28,4),USE(?Toolbar:Up,Toolbar:Up),DISABLE,ICON('VCRUP.ICO')
   BUTTON,AT(40,4),USE(?Toolbar:Down,Toolbar:Down),DISABLE,ICON('VCRDOWN.ICO')
   BUTTON,AT(52,4),USE(?Toolbar:PageDown,Toolbar:PageDown),DISABLE,ICON('VCRNEXT.ICO')
   BUTTON,AT(64,4),USE(?Toolbar:Bottom,Toolbar:Bottom),DISABLE,ICON('VCRLAST.ICO')
    END
   END

ThisWindow  CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeAccepted PROCEDURE(),BYTE,PROC,VIRTUAL
            END
```

```
CODE
 ThisWindow.Run()

ThisWindow.Init PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
 SELF.FirstField = 1
 OPEN(Frame)
 SELF.Opened=True
 RETURN ReturnValue

ThisWindow.TakeAccepted PROCEDURE()
 CODE
 CASE ACCEPTED()
 OF Toolbar:First TO Toolbar:Last         !post toolbar event to active thread
  POST(EVENT:Accepted,ACCEPTED(),SYSTEM{Prop:Active})
  RETURN Level:Notify
 OF ?OrderTree
  START(OrderTree,25000)                  !start OrderTree procedure/thread
 END
 RETURN PARENT.TakeAccepted()
OrderTree       PROCEDURE                !template generated Window procedure
                                         ! with RelTree control template
DisplayString     STRING(255)
Toolbar        ToolbarClass              !declare Toolbar object
REL1::Toolbar     CLASS(ToolbarReltreeClass)  !derive REL1::Toolbar object (target)
TakeEvent        PROCEDURE(<*LONG VCR>,WindowManager WM),VIRTUAL
            END
!template generated RelTree QUEUEs and vaiables

window WINDOW('Browse Orders'),AT(,,115,110),SYSTEM,GRAY,DOUBLE,MDI
     LIST,AT(5,4,106,100),USE(?RelTree),FORMAT('800LT@s200@'),FROM(Queue:RelTree)
    END

ThisWindow   CLASS(WindowManager)           !derive ThisWindow object
Init           PROCEDURE(),BYTE,PROC,VIRTUAL
Kill           PROCEDURE(),BYTE,PROC,VIRTUAL
TakeFieldEvent PROCEDURE(),BYTE,PROC,VIRTUAL
             END
```

```
  CODE
  GlobalResponse = ThisWindow.Run()
 !template generated RelTree ROUTINEs

ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
  ReturnValue = PARENT.Init()
  SELF.FirstField = ?RelTree
  SELF.VCRRequest &= VCRRequest
  SELF.Errors &= GlobalErrors
  SELF.AddItem(Toolbar)              !register Toolbar with ThisWindow
  Relate:Customer.Open
  DO REL1::ContractAll
  OPEN(window)
  SELF.Opened=True
  Toolbar.AddTarget(REL1::Toolbar,?RelTree)  !make REL1::Toolbar a toolbar target
  Toolbar.SetTarget(?RelTree)        !make REL1::Toolbar the active target
 ?RelTree{Prop:Selected} = 1
 SELF.SetAlerts()
 RETURN ReturnValue

REL1::Toolbar.TakeEvent PROCEDURE(<*LONG VCR>,WindowManager WM)
 CODE                               !convert toolbar events to
  CASE ACCEPTED()                   ! Reltree-specific actions
  OF Toolbar:Bottom TO Toolbar:Up
    SELF.Control{PROPLIST:MouseDownRow} = CHOICE(SELF.Control)
    EXECUTE(ACCEPTED()-Toolbar:Bottom+1)
      DO REL1::NextParent            !on Toolbar:Bottom
      DO REL1::PreviousParent        !on Toolbar:Top
      DO REL1::NextLevel             !on Toolbar:PageDown
      DO REL1::PreviousLevel         !on Toolbar:PageUp
      DO REL1::NextRecord            !on Toolbar:Down
      DO REL1::PreviousRecord        !on Toolbar:Up
    END
  END
```

ToolbarReltreeClass Properties

The ToolbarReltreeClass inherits all the properties of the ToolbarTarget from which it is derived. See *ToolbarTarget Properties* for more information.

ToolbarReltreeClass Methods

The ToolbarReltreeClass inherits all the methods of the ToolbarTarget from which it is derived. See *ToolbarTarget Methods* for more information.

In addition to (or instead of) the inherited methods, the ToolbarReltreeClass contains the following methods:

DisplayButtons (enable appropriate toolbar buttons:ToolbarReltreeClass)

DisplayButtons, VIRTUAL

The **DisplayButtons** method enables and disables the appropriate toolbar buttons for the ToolbarReltreeClass object based on the values of the HelpButton, InsertButton, ChangeButton, DeleteButton, and SelectButton properties.

Implementation: The TakeToolbar method calls the DisplayButtons method.

Example:

```
 CODE
 Toolbar.Init                                  !initialize Toolbar object
  ToolBar.AddTarget( ToolBarForm, -1 )         !register an Update Form target
  Toolbar.AddTarget( REL1::Toolbar, ?RelTree ) !register a RelTree target
  ToolBar.SetTarget( ?RelTree )                !calls DisplayButtons via TakeToolbar
 !program code

MyToolbarReltreeClass.DisplayButtons PROCEDURE !a derived class virtual
 CODE
 DISABLE(Toolbar:History)                      !disable toolbar ditto button
 ENABLE(Toolbar:Locate)                        !enable locator button
 PARENT.DisplayButtons                         !call base class DisplayButtons
 !your custom code here
```

See Also: HelpButton, InsertButton, ChangeButton, DeleteButton, SelectButton, TakeToolbar

TakeToolbar (assume control of the toolbar:ToolbarReltreeClass)

TakeToolbar, VIRTUAL

The **TakeToolbar** method sets the toolbar state appropriate to the ToolbarReltreeClass object.

Implementation: The TakeToolbar method sets appropriate TIP attributes for the toolbar buttons and enables and disables toolbar buttons appropriate for the ToolbarReltreeClass object. The ToolbarClass.SetTarget method calls the TakeToolbar method.

Example:

```
 CODE
 Toolbar.Init                                    !initialize Toolbar object
  ToolBar.AddTarget( ToolBarForm, -1 )           !register an Update Form target
  Toolbar.AddTarget( REL1::Toolbar, ?RelTree )   !register a RelTree target
  ToolBar.SetTarget( ?RelTree )                  !calls TakeToolbar
 !program code

MyToolbarReltreeClass.TakeToolbar PROCEDURE      !a derived class virtual
 CODE
 !your custom code here
 SELF.DisplayButtons                             !enable appropriate buttons
```

See Also: ToolbarClass.SetTarget

ToolbarTargetClass

ToolbarTarget Overview

ToolbarClass and ToolbarTarget objects work together to reliably "convert" an event associated with a toolbar button into an appropriate event associated with a specific control or window. This lets you use a single toolbar to drive a variety of targets, such as update forms, browse lists, relation tree lists, etc. A single toolbar can even drive multiple targets (two or more BrowseBoxes) in a single procedure.

Although the ToolbarTarget is useful by itself, other more useful classes are derived from it (ToolbarListboxClass, the ToolbarRelTreeClass, and the ToolbarUpdateClass), and other structures, such as the ToolbarClass, use it to reference any of these derived classes. The classes derived from ToolbarTarget let you set the state of the toolbar appropriate to the toolbar driven entity (set tooltips, enable/disable buttons, etc.), then process toolbar events for the entity by converting the generic toolbar events into appropriate entity-specific events.

ToolbarTarget Concepts

Within an MDI application, the ToolbarClass and ToolbarTarget work together to reliably interpret and pass an event (EVENT:Accepted) associated with a toolbar button into an event associated with a specific control or window. For example, the end user CLICKS on a toolbar button (say the "Insert" button) on the MDI application frame. The frame procedure forwards the event to the active thread (**`POST(EVENT:Accepted,ACCEPTED(),SYSTEM{Prop:Active})`**). The active thread (procedure) manages a window that displays two LIST controls, and one of the LISTs has focus. This procedure has a ToolbarClass object plus a ToolbarTarget object for each LIST control. The ToolbarClass object takes the event (ToolbarClass.TakeEvent)[1] and forwards the event to the *active* ToolbarTarget object (the target that represents the LIST with focus). The ToolbarTarget object takes the event (ToolbarListBoxClass.TakeEvent) and handles it by posting an appropriate event to a specific control or to the window, for example:

```
POST(EVENT:ACCEPTED,SELF.InsertButton) !insert a record
POST(EVENT:PageDown,SELF.Control)      !scroll a LIST
POST(EVENT:Completed)                  !complete an update form
POST(EVENT:CloseWindow)                !select a record
etc.
```

[1]If the procedure has a WindowManager object, the WindowManager object takes the event (WindowManager.TakeEvent) and forwards it to the ToolbarClass object (WindowManager.TakeAccepted).

ToolbarTarget Relationship to Other Application Builder Classes

At present, the ABC Library has three classes derived from the ToolbarTarget class:

ToolbarListboxClass	BrowseClass toolbar target
ToolbarReltreeClass	Reltree control toolbar target
ToolbarUpdateClass	Form procedure toolbar target

These ToolbarTarget objects convert generic toolbar events into appropriate entity-specific events. There may be zero or more ToolbarTarget objects within a procedure; however, *only one is active* at a time.

The ToolbarClass keeps a list of ToolbarTarget objects so it can forward events and method calls to a particular target.

ToolbarTarget ABC Template Implementation

Each template that requests global toolbar control instantiates a ToolbarTarget object. The FormVCRControls template's ToolbarTarget object is called ToolBarForm; the RelationTree template's ToolbarTarget object is called REL#::Toolbar, where # is the RelationTree template's instance number; and the BrowseBox's ToolbarTarget object is completely encapsulated within the BrowseClass object and is not referenced in the template generated code. You may see code such as the following in your template generated procedures.

```
Toolbar    ToolbarClass      !declare Toolbar object
 CODE
 !
ThisWindow.Init PROCEDURE
 SELF.AddItem(Toolbar)                     !register Toolbar with WindowManager
 BRW1.AddToolbarTarget(Toolbar)            !register BrowseClass as target
 Toolbar.AddTarget(REL1::Toolbar,?RelTree) !register RelTree as target
 SELF.AddItem(ToolbarForm)                 !register update form as target
```

ToolbarTarget Source Files

The ToolbarTarget source code is installed by default to the Clarion \LIBSRC folder. The ToolbarTarget source code and its respective components are contained in:

ABTOOLBA.INC	ToolbarTarget declarations
ABTOOLBA.CLW	ToolbarTarget method definitions

ToolbarTarget Properties

ChangeButton (change control number)

ChangeButton SIGNED

The **ChangeButton** property contains the control number (usually represented by the control's Field Equate Label) of the window control that invokes the change record action for this ToolbarTarget object.

A value of zero (0) disables the toolbar change button.

Implementation: The ToolbarTarget object uses this property to enable or disable the toolbar change button, and as the target control when POSTing certain events. See POST in the *Language Reference* for more information. The ToolbarTarget object POSTs an EVENT:Accepted to the ChangeButton control when the end user CLICKS the toolbar change button.

Control (window control)

Control SIGNED

The **Control** property contains the control number (usually represented by the control's Field Equate Label) of the window control associated with this ToolbarTarget object. For ToolbarTarget objects that do not have an associated control (update forms), the Control property may contain any identifying number.

The ToolbarTarget object uses this property as the target control when POSTing certain events. See POST in the *Language Reference*.

The ToolbarClass.AddTarget method sets the value of this property.

Implementation: By convention, update forms have a Control value of negative one (-1).

See Also: ToolbarClass.AddTarget

DeleteButton (delete control number)

DeleteButton SIGNED

The **DeleteButton** property contains the control number (usually represented by the control's Field Equate Label) of the window control that invokes the delete record action for this ToolbarTarget object.

A value of zero (0) disables the toolbar delete button.

Implementation: The ToolbarTarget object uses this property to enable or disable the toolbar delete button, and as the target control when POSTing certain events. See POST in the *Language Reference* for more information. The ToolbarTarget object POSTs an EVENT:Accepted to the DeleteButton control when the end user CLICKS the toolbar delete button.

HelpButton (help control number)

HelpButton SIGNED

The **HelpButton** property contains the control number (usually represented by the control's Field Equate Label) of the window control that invokes Windows help for this ToolbarTarget object.

A value of zero (0) disables the toolbar help button.

Implementation: The ToolbarTarget object uses this property to enable or disable the toolbar help button. The ToolbarTarget object "presses" the help (F1) key when the end user CLICKS the toolbar help button.

InsertButton (insert control number)

InsertButton SIGNED

The **InsertButton** property contains the control number (usually represented by the control's Field Equate Label) of the window control that invokes the insert record action for this ToolbarTarget object.

A value of zero (0) disables the toolbar insert button.

Implementation: The ToolbarTarget object uses this property to enable or disable the toolbar insert button, and as the target control when POSTing certain events. See POST in the *Language Reference* for more information. The ToolbarTarget object POSTs an EVENT:Accepted to the InsertButton control when the end user CLICKS the toolbar insert button.

LocateButton(query control number)

LocateButton SIGNED

The **LocateButton** property contains the control number (usually represented by the control's field equate label) of the window control that invokes the query action for this ToolbarTarget object.

A value of zero (0) disables the toolbar Locate button.

Implementation: The ToolbarTarget object uses this property to enable or disable the toolbar Locate button, and as the target control when POSTing certain events. See POST in the *Language Reference* for more information. The ToolbarTarget object POSTs an EVENT:Accepted to the LocateButton control when the user Presses the toolbar locate button.

The LocateButton control is used when the QBE extension template has been added to a procedure.

See Also: ToolbarTarget.DisplayButtons

SelectButton (select control number)

SelectButton SIGNED

The **SelectButton** property contains the control number (usually represented by the control's Field Equate Label) of the window control that invokes the select record action for this ToolbarTarget object.

A value of zero (0) disables the toolbar select button.

Implementation: The ToolbarTarget object uses this property to enable or disable the toolbar select button, and as the target control when POSTing certain events. See POST in the *Language Reference* for more information. The ToolbarTarget object POSTs an EVENT:Accepted to the SelectButton control when the end user CLICKS the toolbar select button.

ToolbarTarget Methods

ToolbarTarget Functional Organization--Expected Use

As an aid to understanding the ToolbarTarget class, it is useful to recognize that all its methods are virtual. Typically you will not call these methods directly from your program--the ToolbarClass methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Virtual Methods

DisplayButtons	enable appropriate toolbar buttons
TryTakeToolbar	return toolbar control indicator
TakeToolbar	assume control of the toolbar
TakeEvent	convert toolbar events

DisplayButtons (enable appropriate toolbar buttons:ToolbarTarget)

DisplayButtons, VIRTUAL

The **DisplayButtons** method enables and disables the appropriate toolbar buttons for the ToolbarTarget object based on the values of the HelpButton, InsertButton, ChangeButton, DeleteButton, and SelectButton properties.

Implementation: The ToolbarListboxClass.TakeToolbar, ToolbarRelTreeClass.TakeToolbar, and ToolbarUpdateClass.TakeToolbar methods call the DisplayButtons method. The DisplayButtons method appropriately enables and disables toolbar buttons common to all ToolbarTarget objects.

Example:

```
MyToolbarListboxClass.DisplayButtons PROCEDURE
 CODE
 PARENT.DisplayButtons              !Call base class DisplayButtons
 !your custom code here
```

See Also: HelpButton, InsertButton, ChangeButton, DeleteButton, SelectButton, TakeToolbar, ToolbarRelTreeClass.TakeToolbar, ToolbarUpdateClass.TakeToolbar

TakeEvent (convert toolbar events:ToolbarTarget)

TakeEvent([*vcr*]*, window manager* **), VIRTUAL**

TakeEvent Process toolbar events for this toolbar target.

vcr An integer variable to receive the control number of the accepted VCR navigation button. If omitted, the ToolbarTarget object does no "post processing" navigation.

Windowmanager
The label of the ToolbarTarget object's WindowManager object. See *Window Manager* for more information.

The **TakeEvent** method handles toolbar events for this toolbar target.

The *vcr* parameter lets the TakeEvent method specify an appropriate subsequent or secondary action. For example, the ToolbarUpdateClass.TakeEvent method (for a FORM), may interpret a vcr scroll down as "save and then scroll." The method takes the necessary action to save the item and accomplishes the secondary scroll action by setting the *vcr* parameter.

Implementation: The ToolbarClass.TakeEvent method calls the TakeEvent method for the active ToolbarTarget object. The ToolbarClass.SetTarget method sets the active ToolbarTarget object. The TakeEvent method POSTs an EVENT:Accepted to the appropriate local control (insert, change, delete, help) common to all ToolbarTarget objects.

Example:

```
REL1::Toolbar.TakeEvent PROCEDURE(<*LONG VCR>,WindowManager WM)
  CODE
  CASE ACCEPTED()
  OF Toolbar:Bottom TO Toolbar:Up
    SELF.Control{PROPLIST:MouseDownRow} = CHOICE(SELF.Control)
    EXECUTE(ACCEPTED()-Toolbar:Bottom+1)
      DO REL1::NextParent
      DO REL1::PreviousParent
      DO REL1::NextLevel
      DO REL1::PreviousLevel
      DO REL1::NextRecord
      DO REL1::PreviousRecord
    END
  OF Toolbar:Insert TO Toolbar:Delete
    SELF.Control{PROPLIST:MouseDownRow} = CHOICE(SELF.Control)
    EXECUTE(ACCEPTED()-Toolbar:Insert+1)
      DO REL1::AddEntry
      DO REL1::EditEntry
      DO REL1::RemoveEntry
    END
  ELSE
    PARENT.TakeEvent(VCR,ThisWindow)
  END
```

See Also: ToolbarClass.SetTarget, ToolbarClass.TakeEvent

TakeToolbar (assume control of the toolbar:ToolbarTarget)

TakeToolbar, VIRTUAL

The **TakeToolbar** method is a placeholder method to set the toolbar state appropriate to the ToolbarTarget object. This includes setting MSG and TIP attributes, enabling and disabling appropriate buttons, etc.

The TakeToolbar method is a placeholder method for derived classes.

See Also: ToolbarListboxClass.TakeToolbar, ToolbarRelTreeClass.TakeToolbar, ToolbarUpdateClass.TakeToolbar

TryTakeToolbar (return toolbar control indicator:ToolbarTarget)

TryTakeToolbar, VIRTUAL

The **TryTakeToolbar** method is a virtual placeholder method to return a value indicating whether the ToolbarTarget object successfully assumed control of the toolbar. A return value of one (1 or True) indicates success; a value of zero (0 or False) indicates failure to take control of the toolbar.

The TryTakeToolbar method is a placeholder method for derived classes.

Return Data Type: BYTE

See Also: ToolbarListboxClass.TryTakeToolbar, ToolbarUpdateClass.TryTakeToolbar

ToolbarUpdateClass

ToolbarUpdateClass Overview

The ToolbarUpdateClass is a ToolbarTarget that handles events for a template generated Form Procedure that is called from a template generated Browse Procedure. See *Procedure Templates--Browse* and Form for more information.

ToolbarUpdateClass Concepts

ToolbarUpdateClass objects implement the event handling specific to a template generated Form Procedure. The Form specific events are primarily the event to complete the Form and save the record (EVENT:Accepted for an OK button). There may be zero or several ToolbarTarget objects within a procedure; however, *only one is active* at a time.

ToolbarUpdateClass Relationship to Other Application Builder Classes

The ToolbarUpdateClass is derived from the ToolbarTarget class.

The ToolbarClass keeps a list of ToolbarTarget objects (including ToolbarUpdateClass objects) so it can forward events and method calls to a particular target.

ToolbarUpdateClass ABC Template Implementation

The FormVCRControls extension template generates code to declare a ToolbarUpdateClass object called ToolbarForm, and to register the ToolbarForm object with the procedure's WindowManager.

Once the ToolbarForm is registered with the WindowManager, the WindowManager handles the interaction between the ToolbarClass object and the ToolbarUpdateClass object with no other references in the template generated code.

You can use the FormVCRControl template's prompts to derive from the ToolbarUpdateClass. The templates provide the derived class so you can modify the ToolBarForm's behavior on an instance-by-instance basis.

ToolbarUpdateClass Source Files

The ToolbarUpdateClass source code is installed by default to the Clarion \LIBSRC folder. The ToolbarUpdateClass source code and its respective components are:

ABTOOLBA.INC	ToolbarUpdateClass declarations
ABTOOLBA.CLW	ToolbarUpdateClass method definitions

ToolbarUpdateClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a ToolbarClass object and related ToolbarTarget (ToolbarUpdateClass and ToolbarListboxClass) objects.

This example uses a global toolbar to drive a BrowseClass LIST, its child Form procedure, and the Form procedure's secondary BrowseClass LIST.

The program POSTs toolbar events to the active MDI window using the SYSTEM{Prop:Active} property. Then the local ToolbarClass object calls on the active ToolbarTarget object to handle the event.

```
 PROGRAM
_ABCDllMode_  EQUATE(0)
_ABCLinkMode_ EQUATE(1)

 INCLUDE('ABERROR.INC')
 INCLUDE('ABFILE.INC')
 INCLUDE('ABWINDOW.INC')
 INCLUDE('ABBROWSE.INC')
 INCLUDE('ABTOOLBA.INC')
 INCLUDE('KEYCODES.CLW')

 MAP
Main        PROCEDURE                !contains global toolbar
BrowseCustomers PROCEDURE                !template generated Browse
UpdateCustomer  PROCEDURE                !template generated Form
 END

GlobalErrors  ErrorClass
Access:Customer CLASS(FileManager)
Init          PROCEDURE
          END

Relate:Customer CLASS(RelationManager)
Init          PROCEDURE
Kill          PROCEDURE,VIRTUAL
          END

Access:Orders  CLASS(FileManager)
Init           PROCEDURE
               END
Relate:Orders  CLASS(RelationManager)
Init           PROCEDURE
Kill           PROCEDURE,VIRTUAL
               END
GlobalRequest  BYTE(0),THREAD
GlobalResponse BYTE(0),THREAD
VCRRequest    LONG(0),THREAD

Customer      FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,BINDABLE,THREAD
KeyCustNumber  KEY(CUS:CustNumber),NOCASE,OPT
```

```
KeyCompany     KEY(CUS:Company),DUP,NOCASE
Record         RECORD,PRE()
CustNumber      LONG
Company         STRING(20)
ZipCode         LONG
               END
              END
Orders        FILE,DRIVER('TOPSPEED'),PRE(ORD),CREATE,BINDABLE,THREAD
KeyOrderNumber KEY(ORD:OrderNumber),NOCASE,OPT,PRIMARY
KeyCustNumber  KEY(ORD:CustNumber),DUP,NOCASE,OPT
Record         RECORD,PRE()
CustNumber      LONG
OrderNumber     SHORT
InvoiceAmount   DECIMAL(7,2)
               END
              END
 CODE
 GlobalErrors.Init
 Relate:Customer.Init
 Relate:Orders.Init
 Main                     !run Application Frame w/ toolbar
 Relate:Customer.Kill
 Relate:Orders.Kill
 GlobalErrors.Kill

Main PROCEDURE                  !Application Frame w/ toolbar
Frame APPLICATION('Application'),AT(,,310,210),SYSTEM,MAX,RESIZE,IMM
    MENUBAR
     ITEM('Browse Customers'),USE(?BrowseCustomers)
    END
    TOOLBAR,AT(0,0,,20)          !must use toolbar EQUATEs
   BUTTON,AT(4,4),USE(?Toolbar:Top,Toolbar:Top),DISABLE,ICON('VCRFIRST.ICO')
   BUTTON,AT(16,4),USE(?Toolbar:PageUp,Toolbar:PageUp),DISABLE,ICON('VCRPRIOR.ICO')
   BUTTON,AT(28,4),USE(?Toolbar:Up,Toolbar:Up),DISABLE,ICON('VCRUP.ICO')
   BUTTON,AT(40,4),USE(?Toolbar:Down,Toolbar:Down),DISABLE,ICON('VCRDOWN.ICO')
   BUTTON,AT(52,4),USE(?Toolbar:PageDown,Toolbar:PageDown),DISABLE,ICON('VCRNEXT.ICO')
   BUTTON,AT(64,4),USE(?Toolbar:Bottom,Toolbar:Bottom),DISABLE,ICON('VCRLAST.ICO')
   BUTTON,AT(96,4),USE(?Toolbar:Insert,Toolbar:Insert),DISABLE,ICON('INSERT.ICO')
   BUTTON,AT(108,4),USE(?Toolbar:Change,Toolbar:Change),DISABLE,ICON('EDIT.ICO')
   BUTTON,AT(121,4),USE(?Toolbar:Delete,Toolbar:Delete),DISABLE,ICON('DELETE.ICO')
    END
   END

FrameWindow CLASS(WindowManager)
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeAccepted PROCEDURE(),BYTE,PROC,VIRTUAL
            END
 CODE
 FrameWindow.Run()
FrameWindow.Init PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
```

```
 SELF.FirstField = 1
 OPEN(Frame)
 SELF.Opened=True
 RETURN ReturnValue

FrameWindow.TakeAccepted PROCEDURE()
 CODE
 CASE ACCEPTED()
 OF Toolbar:First TO Toolbar:Last         !post toolbar event to active thread
  POST(EVENT:Accepted,ACCEPTED(),SYSTEM{Prop:Active})
  RETURN Level:Notify
 OF ?BrowseCustomers
  START(BrowseCustomers,25000)           !start BrowseCustomers procedure/thread
 END
 RETURN PARENT.TakeAccepted()

BrowseCustomers PROCEDURE                !template generated Browse
CustView    VIEW(Customer)
            END
CustQ          QUEUE
CUS:CustNumber  LIKE(CUS:CustNumber)
CUS:Company     LIKE(CUS:Company)
CUS:ZipCode     LIKE(CUS:ZipCode)
ViewPosition    STRING(1024)
               END



QuickWindow   WINDOW('Browse Customers'),AT(,,211,155),IMM,SYSTEM,GRAY,DOUBLE,MDI
         LIST,AT(8,6,198,142),USE(?CustList),IMM,HVSCROLL,FROM(CustQ),|
         FORMAT('28R(2)|M~ID~C(0)@n4@80L(2)|M~Company~36L(2)|M~Zip~@P#####P@')
         BUTTON('&Insert'),AT(49,62),USE(?Insert),HIDE
         BUTTON('&Change'),AT(98,62),USE(?Change),HIDE,DEFAULT
         BUTTON('&Delete'),AT(147,62),USE(?Delete),HIDE
        END

BrowseWindow  CLASS(WindowManager)       !derive BrowseWindow object
Init        PROCEDURE(),BYTE,PROC,VIRTUAL
Kill        PROCEDURE(),BYTE,PROC,VIRTUAL
Run         PROCEDURE(USHORT Number,BYTE Request),BYTE,PROC,VIRTUAL
         END

Toolbar    ToolbarClass             !declare Toolbar object
BRW1      CLASS(BrowseClass)        !derive BRW1 object from BrowseClass
Q         &CustQ
        END
 CODE
 GlobalResponse = BrowseWindow.Run()

BrowseWindow.Init PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Init()
```

```
 SELF.FirstField = ?CustList
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 SELF.AddItem(Toolbar)             !register Toolbar with BrowseWindow
 Relate:Customer.Open
 BRW1.Init(?CustList,CustQ.ViewPosition,CustView,CustQ,Relate:Customer,SELF)
 OPEN(QuickWindow)
 SELF.Opened=True
 BRW1.Q &= CustQ
 BRW1.AddSortOrder(,CUS:KeyCompany)     !set scroll order for Browse AND child Form
 BRW1.AddField(CUS:CustNumber,BRW1.Q.CUS:CustNumber)
 BRW1.AddField(CUS:Company,BRW1.Q.CUS:Company)
 BRW1.AddField(CUS:ZipCode,BRW1.Q.CUS:ZipCode)
 BRW1.AskProcedure = 1
 BRW1.InsertControl=?Insert
 BRW1.ChangeControl=?Change
 BRW1.DeleteControl=?Delete
 BRW1.AddToolbarTarget(Toolbar)       !BRW1 instantiates a ToolbarListboxClass
 SELF.SetAlerts()                     ! object, and makes it a target
 RETURN ReturnValue

BrowseWindow.Kill PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 Relate:Customer.Close
 RETURN ReturnValue

BrowseWindow.Run PROCEDURE(USHORT Number,BYTE Request)
 CODE
 GlobalRequest = Request
 UpdateCustomer                    !Browse Procedure calls Form Procedure
 RETURN GlobalResponse

UpdateCustomer PROCEDURE           !template generated Form Procedure

OrderView    VIEW(Orders)
             END



OrderQ           QUEUE
ORD:OrderNumber   LIKE(ORD:OrderNumber)
ORD:InvoiceAmount LIKE(ORD:InvoiceAmount)
ViewPosition      STRING(1024)
                 END

QuickWindow WINDOW('Update Customer'),AT(,,172,132),IMM,GRAY,DOUBLE,MDI
       SHEET,AT(4,4,164,106),USE(?CurrentTab)
        TAB('Customer'),USE(?CustomerTab)
         PROMPT('&Cust Number:'),AT(8,23),USE(?CustNumber:Prompt)
         STRING(@n4),AT(64,23),USE(CUS:CustNumber),RIGHT(1)
         PROMPT('&Company:'),AT(8,36),USE(?Company:Prompt)
```

```
          ENTRY(@s20),AT(64,36),USE(CUS:Company)
          PROMPT('&Zip Code:'),AT(8,52),USE(?Zip:Prompt)
          ENTRY(@P#####P),AT(64,52),USE(CUS:ZipCode),RIGHT(1)
         END
         TAB('Orders'),USE(?OrderTab)
          LIST,AT(8,22,156,81),USE(?OrdList),IMM,HVSCROLL,FROM(OrderQ),|
          FORMAT('52R(2)|M~Order ID~C(0)@n-7@60D(12)|M~Amount~C(0)@n-10.2@')
         END
        END
        BUTTON('OK'),AT(97,114),USE(?OK),DEFAULT
        BUTTON('Cancel'),AT(133,114),USE(?Cancel)
       END


FormWindow CLASS(WindowManager)       !derive FormWindow from WindowManager
Init         PROCEDURE(),BYTE,PROC,VIRTUAL
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL
TakeSelected PROCEDURE(),BYTE,PROC,VIRTUAL
           END

Toolbar    ToolbarClass          !declare Toolbar object
ToolbarForm  ToolbarUpdateClass       !declare ToolbarForm object
OrderBrowse  CLASS(BrowseClass)       !derive OrderBrowse from BrowseClass
Q            &OrderQ
           END
 CODE
 GlobalResponse = FormWindow.Run()

FormWindow.Init PROCEDURE()
ReturnValue    BYTE,AUTO
 CODE
 SELF.Request = GlobalRequest
 ReturnValue = PARENT.Init()
 SELF.FirstField = ?CustNumber:Prompt
 SELF.VCRRequest &= VCRRequest
 SELF.Errors &= GlobalErrors
 CLEAR(GlobalRequest)
 CLEAR(GlobalResponse)
 SELF.AddItem(?Cancel,RequestCancelled)
 Relate:Customer.Open
 SELF.Primary &= Relate:Customer
 SELF.OkControl = ?OK
 IF SELF.PrimeUpdate() THEN RETURN Level:Notify.
 OrderBrowse.Init(?OrdList,OrderQ.ViewPosition,OrderView,OrderQ,Relate:Orders,SELF)
 OPEN(QuickWindow)
 SELF.Opened=True
 OrderBrowse.Q &= OrderQ
 OrderBrowse.AddSortOrder(,ORD:KeyCustNumber)
 OrderBrowse.AddRange(ORD:CustNumber,Relate:Orders,Relate:Customer)
 OrderBrowse.AddField(ORD:OrderNumber,OrderBrowse.Q.ORD:OrderNumber)
 OrderBrowse.AddField(ORD:InvoiceAmount,OrderBrowse.Q.ORD:InvoiceAmount)
 SELF.AddItem(Toolbar)              !Register Toolbar with FormWindow
 SELF.AddItem(ToolbarForm)          !Register ToolbarForm with FormWindow
```

```
                                    ! (and with FormWindow's Toolbar)
 OrderBrowse.AddToolbarTarget(Toolbar)!Instantiate a ToolbarListboxClass object,
 SELF.SetAlerts()                    ! and register with FormWindow's Toolbar
 RETURN ReturnValue

FormWindow.Kill PROCEDURE()
ReturnValue   BYTE,AUTO
 CODE
 ReturnValue = PARENT.Kill()
 Relate:Customer.Close
 RETURN ReturnValue

FormWindow.TakeSelected PROCEDURE
 CODE
 IF FIELD(){PROP:Type}=Create:List
  Toolbar.SetTarget(FIELD())        !make selected list the active Target
 END                                !(FormWindow also auto selects the Target)
 RETURN PARENT.TakeSelected()

Access:Customer.Init PROCEDURE
 CODE
 PARENT.Init(Customer,GlobalErrors)
 SELF.FileNameValue = 'Customer'
 SELF.Buffer &= CUS:Record
 SELF.Create = 1
 SELF.AddKey(CUS:KeyCustNumber,'CUS:KeyCustNumber',1)
 SELF.AddKey(CUS:KeyCompany,'CUS:KeyCompany',0)
 SELF.AddKey(CUS:KeyZipCode,'CUS:KeyZipCode',0)

Access:Orders.Init PROCEDURE
 CODE
 PARENT.Init(Orders,GlobalErrors)
 SELF.FileNameValue = 'Orders'
 SELF.Buffer &= ORD:Record
 SELF.Create = 1
 SELF.AddKey(ORD:KeyOrderNumber,'ORD:KeyOrderNumber',1)
 SELF.AddKey(ORD:KeyCustNumber,'ORD:KeyCustNumber',0)

Relate:Customer.Init PROCEDURE
 CODE
 Access:Customer.Init
 PARENT.Init(Access:Customer,1)
 SELF.AddRelation(Relate:Orders,RI:CASCADE,RI:RESTRICT,ORD:KeyCustNumber)
 SELF.AddRelationLink(CUS:CustNumber,ORD:CustNumber)

Relate:Customer.Kill PROCEDURE
 CODE
 Access:Customer.Kill
 PARENT.Kill

Relate:Orders.Init PROCEDURE
 CODE
 Access:Orders.Init
```

```
 PARENT.Init(Access:Orders,1)
 SELF.AddRelation(Relate:Customer)


Relate:Orders.Kill PROCEDURE
 CODE
 Access:Orders.Kill
 PARENT.Kill
```

ToolbarUpdateClass Properties

The ToolbarUpdateClass inherits all the properties of the ToolbarTarget from which it is derived. See *ToolbarTarget Properties* for more information.

In addition to the inherited properties, the ToolbarUpdateClass contains the following properties.

Request (requested database operation)

Request BYTE

The **Request** property indicates for what purpose the ToolbarUpdateClass object's entity is used. The ToolbarUpdateClass uses this value to set appropriate toolbar button TIP attributes and enable and disable the appropriate toolbar buttons.

Implementation: The TakeToolbar and DisplayButtons methods set the toolbar state based on the value of the Request property. EQUATEs for the Request values are declared in TPLEQU.CLW as follows:

```
InsertRecord  EQUATE (1)  !Add a record
ChangeRecord  EQUATE (2)  !Change the current record
DeleteRecord  EQUATE (3)  !Delete the current record
SelectRecord  EQUATE (4)  !Select the current record
```

See Also: DisplayButtons, TakeToolbar

History (enable toolbar history button)

History **BYTE**

The **History** property indicates whether or not to enable the toolbar history (ditto) button for this ToolbarUpdateClass object. The ToolbarUpdateClass uses this value to set the appropriate toolbar button TIP attribute and enable or disable the appropriate toolbar button.

By convention the history button restores the previous value for a field or record. See *Control Templates--SaveButton* for more information.

Implementation: The TakeToolbar and DisplayButtons methods set the toolbar state based on the value of the History property. A History value of one (1) enables the toolbar history button; a value of zero (0) disables the history button

See Also: DisplayButtons, TakeToolbar

ToolbarUpdateClass Methods

The ToolbarUpdateClass inherits all the methods of the ToolbarTarget from which it is derived. See *ToolbarTarget Methods* for more information.

In addition to (or instead of) the inherited methods, the ToolbarUpdateClass contains the following methods:

DisplayButtons (enable appropriate toolbar buttons:ToolbarUpdateClass)

DisplayButtons, VIRTUAL

The **DisplayButtons** method enables and disables the appropriate toolbar buttons for the ToolbarUpdateClass object based on the values of the HelpButton, InsertButton, ChangeButton, DeleteButton, and SelectButton properties.

Implementation: The TakeToolbar method calls the DisplayButtons method.

Example:

```
 CODE
 Toolbar.Init                                  !initialize Toolbar object
 ToolBar.AddTarget( ToolbarForm, -1 )          !register an Update Form target
 Toolbar.AddTarget( REL1::Toolbar, ?RelTree )  !register a RelTree target
 ToolBar.SetTarget( -1 )                       !calls DisplayButtons via TakeToolbar
 !program code

MyToolbarUpdateClass.DisplayButtons PROCEDURE !a derived class virtual
 CODE
 ENABLE(Toolbar:History)                       !enable toolbar ditto button
 DISABLE(Toolbar:Locate)                       !disable locator button
 PARENT.DisplayButtons                         !call base class DisplayButtons
 !your custom code here
```

See Also: HelpButton, InsertButton, ChangeButton, DeleteButton, SelectButton, TakeToolbar

TakeEvent (convert toolbar events:ToolbarUpdateClass)

TakeEvent([*vcr*], *window manager* **), VIRTUAL**

TakeEvent Handles toolbar events for the ToolbarUpdateClass object.

vcr An integer variable to receive the control number of the accepted VCR navigation button. This lets the TakeEvent method specify an appropriate subsequent action. If omitted, the ToolbarUpdateClass object does no "post processing" navigation.

windowmanager The label of the ToolbarUpdateClass object's WindowManager object. See *Window Manager* for more information.

The **TakeEvent** method handles toolbar events for the ToolbarUpdateClass object.

The *vcr* parameter lets the TakeEvent method specify an appropriate subsequent or secondary action. For example, the ToolbarUpdateClass.TakeEvent method (for a FORM), may interpret a vcr scroll down as "save and then scroll." The method takes the necessary action to save the item and accomplishes the secondary scroll action by setting the *vcr* parameter.

Implementation: The ToolbarClass.TakeEvent method calls the TakeEvent method for the active ToolbarTarget object. The ToolbarClass.SetTarget method sets the active ToolbarTarget object.

Example:

```
ToolbarClass.TakeEvent PROCEDURE(<*LONG VCR>,WindowManager WM)
  CODE
 ASSERT(~SELF.List &= NULL)
 IF RECORDS(SELF.List)
  SELF.List.Item.TakeEvent(VCR,WM)
 END
```

See Also: ToolbarClass.SetTarget, ToolbarClass.TakeEvent

TakeToolbar (assume control of the toolbar:ToolbarUpdateClass)

TakeToolbar, VIRTUAL

The **TakeToolbar** method sets the toolbar state appropriate to the ToolbarUpdateClass object.

Implementation: The TakeToolbar method sets appropriate TIP attributes for the toolbar buttons and enables and disables toolbar buttons appropriate for the ToolbarUpdateClass object. The ToolbarClass.SetTarget method and the TryTakeToolbar method call the TakeToolbar method.

Example:

```
 CODE
 Toolbar.Init                                    !initialize Toolbar object
  ToolBar.AddTarget( ToolbarForm, -1 )           !register an Update Form target
  Toolbar.AddTarget( REL1::Toolbar, ?RelTree )   !register a RelTree target
  ToolBar.SetTarget( -1 )                        !calls TakeToolbar
 !program code

MyToolbarUpdateClass.TakeToolbar PROCEDURE       !a derived class virtual
 CODE
 !your custom code here
 SELF.DisplayButtons                             !enable appropriate buttons
```

See Also: ToolbarClass.SetTarget, TryTakeToolbar

TryTakeToolbar (return toolbar control indicator:ToolbarUpdateClass)

TryTakeToolbar, VIRTUAL

The **TryTakeToolbar** method returns a value indicating whether the ToolbarTarget object successfully assumed control of the toolbar. A return value of one (1 or True) indicates success; a value of zero (0 or False) indicates failure to take control of the toolbar.

Implementation: The ToolbarClass.SetTarget method calls the TryTakeToolbar method. The TryTakeToolbar method calls the TakeToolbar and returns True because, by default, a ToolbarUpdateClass object may always assume toolbar control.

Return Data Type: BYTE

Example:

```
ToolbarClass.SetTarget PROCEDURE(SIGNED Id)
I USHORT,AUTO
Hit USHORT
  CODE
    ASSERT(~ (SELF.List &= NULL))
    IF Id                     !set explicitly requested target
      SELF.List.Id = Id
      GET(SELF.List,SELF.List.Id)
      ASSERT (~ERRORCODE())
      SELF.List.Item.TakeToolbar
    ELSE                      !set a valid target
      LOOP I = 1 TO RECORDS(SELF.List)
        GET(SELF.List,I)
        IF SELF.List.Item.TryTakeToolbar() THEN Hit = I.
      END
      IF Hit THEN GET(SELF.List,Hit).
    END
```

See Also: TakeToolbar, ToolbarClass.SetTarget

TransactionManagerClass

Overview

The TransactionManager class is used to manage a transaction processing “frame”. It wraps all of the classic operations normally used in a typical transaction process, including LOGOUT, COMMIT, and ROLLBACK operations, and allows you to control them through a simple set of methods. Nearly all ISAM and SQL tables support transaction processing. Please refer to the Database Drivers Help topic for more specific information regarding each individual driver.

TransactionManager Concepts

Override and Control of one or all of the Template-Based Transaction Frames

In a standard application created in the Application Generator, transaction processing of data elements is handled by the target RelationManagers for each primary table. The ABC Templates set the RelationManager’s UseLogout property based on the **Enclose RI code in transaction frame** check box in the *Global Properties* dialog. You can use the TransactionManager (with the help of the supporting templates) to turn off the RelationManager support for transaction framing, and specifically customize the tables that you need to enclose in a transaction frame in a target Form or Process procedure.

Simplified Custom Transaction Processing

All of your hand-coded transaction processing frames can now be encapsulated in the TransactionManager. Using its available methods ensures that proper initialization, processing, and error checking will be performed.

TransactionManager ABC Template Implementation

The TransactionManager is supported by two Extension templates. The Save Button Transaction Frame extension template is used to control transaction processing via the TransactionManager in any Form (update) procedure that uses the Save Button control template. Using the Process Transaction Frame extension template, you can override and control any needed transaction processing that needs to be applied in any process procedure.

The Process Transaction Frame Checkpoint code template is used in any process procedure to specify and control transaction processing over a specific batch of records instead of the normal default processing of individual records.

TransactionManager Relationship to Other Application Builder Classes

The TransactionManager is closely integrated with RelationManager objects. These objects are added to a protected TransactionManagerQueue, where a reference to each RelationManager object and thread instance is stored.

TransactionManager Source Files

The TransactionManager source code is installed by default to the Clarion \LIBSRC folder. The TransactionManager source code and its respective components are contained in:

ABFILE.INC	TransactionManager declarations
ABFILE.CLW	TransactionManager method definitions

TransactionManager Conceptual Example

The following examples show a typical sequence of statements to declare, instantiate, initialize, use, and terminate a TransactionManager.

```
!This example shows all that is needed to implement transaction processing
!using the TransactionManager

MyTransaction  TransactionManager
ReturnValue BYTE
 CODE
  Relate:Invoice.Open()
  MyTransaction.AddItem(Relate:Invoice)
  MyTransaction.AddItem(Relate:Items)
  ReturnValue = Level:Benign
  IF MyTransaction.Start()=Level:Benign !Initialize, begin LOGOUT
     !......
 !Work with the Tables here and set the ReturnValue to Level:Fatal
 !if there are any errors.
     !......
     MyTransaction.Finish(ReturnValue) !Commit or rollback based on errorlevel
  END
!-----------------------------------------------------------------------
!This next partial code example demonstrates how to execute the transaction
!in a process. It uses the SetLogoutOff\RestoreLogout methods. This is used
!when you need a longer transaction in a process where you don't need to
!continually set the Uselogout to TRUE/FALSE repeated times (via Start)

...........
   MyTransaction.AddItem(Relate:Invoice)
   MyTransaction.AddItem(Relate:Items)
   MyTransaction.SetLogoutOff()
...........
```

```
   ReturnValue = MyTransaction.Start()
...........
...........
   MyTransaction.Finish(ReturnValue)
   ReturnValue = MyTransaction.Start()
...........
...........
   MyTransaction.Finish(ReturnValue)
...........
   MyTransaction.RestoreLogout()
...........
! ----------------------------------------------------------------------
!This example shows the use of the Process virtual method.
  PROGRAM
  MAP.
MyTransaction  CLASS(TransactionManager)
Process         PROCEDURE(),BYTE,VIRTUAL
               END

ReturnValue BYTE
 CODE
   Relate:Invoice.Open()
   MyTransaction.AddItem(Relate:Invoice)
   MyTransaction.AddItem(Relate:Items)
   MyTransaction.Run()!This will all the work for you

MyTransaction.Process   PROCEDURE()
ReturnValue   BYTE
 CODE
  ReturnValue = Level:Benign
  !Work with the Tables here and set the ReturnValue to Level:Fatal
  !if there are any errors.
 RETURN ReturnValue
```

TransactionManager Properties

The TransactionManager class contains no public properties.

TransactionManager Methods

AddItem (add a RelationManager to transaction list)

Finish (rollback or commit transaction)

Process (a virtual to process transaction)

Reset (remove all RelationManagers from transaction list)

RestoreLogout (restore all RelationManagers in transaction list to previous status)

Run (initiates transaction sequence)

SetLogoutOff (turn off logout for all RelationManagers in transaction list)

SetTimeout (set timeout used in transaction)

Start (start the transaction)

TransactionCommit (commit the transaction)

TransactionRollBack (rollback the transaction)

AddItem (add a RelationManager to transaction list)

AddItem(*RM,cascadechildren* **)**

AddItem Add the RelationManager object to the TransactionManager list queue.

RM The label of the RelationManager object.

Cascadechildren
An integer constant, variable, EQUATE, or expression that indicates whether the TransactionManager automatically includes any child tables defined by the Relationmanager object into the transaction processA value of one (1 or True) automatically includes all child tables; a value of zero (0 or False) excludes all child tables. If omitted, *cascadechildren* defaults to 1.

AddItem adds a reference to a RelationManager object to the TransactionManager's protected TransactionManagerQueue. This, in effect adds (by default), all tables defined in the RelationManager object to the processing of the TransactionManager.

Implementation: To include a primary table and its associated children in an impending TransactionManager process, you should call AddItem and specify the appropriate RelationManager object in the Init method of the WindowManager or ProcessManager.

Example:

```
IF SELF.Request<>ViewRecord  !for any update
 !activate the Roysched table, but not its defined child tables
 Transaction.AddItem(Relate:Roysched,False)
 !but include the Titles table specifically
 Transaction.AddItem(Relate:Titles,True)
END
```

See Also: RelationManager.UseLogout

Finish (rollback or commit transaction)

Finish(*errorlevel* **)**

Finish	Completes the transaction processing
errorlevel	An integer constant, variable, EQUATE, or expression that sets the current error level, and determines the success of the transaction process.

Finish completes the TransactionManager process. Using the *errorlevel* value it will rollback or commit the transaction. An *errorlevel* of Level:Benign will commit (complete) the transaction, where any other *errorlevel* set will force a rollback (cancellation) of the transaction.

Implementation: The **Finish** method should be called in the TakeCompleted method to validate a transaction. During a process, it can be called at any time to commit or rollback a batch of records processed. The method calls either the TransactionCommit or TransactionRollback methods in order to complete the transaction process.

Example:

```
ReturnValue = PARENT.TakeCompleted()
! A ReturnValue other than Level:Benign will rollback the transaction
IF SELF.Request<>ViewRecord
   Transaction.Finish(ReturnValue)
END
  RETURN ReturnValue
END
```

See Also: Start, TransactionCommit, TransactionRollback

Process (a virtual to process transaction)

Process( ),BYTE,VIRTUAL

Process Process any data during the transaction process.

Process is a virtual placeholder method used to work with any tables affected by the transaction process, and can return the correct error level to control if the transaction should be completed or aborted (COMMIT or ROLLBACK respectively).

Return Value: BYTE

Implementation: The Process method is a virtual method that will be called from the Run method only if the Start method first returns a Level:Benign error level. After that, if the Process method returns any error level other than Level:Benign, the transaction will rollback.

Example:

```
MyTransaction.Process   PROCEDURE()
ReturnValue   BYTE
 CODE
    ReturnValue = Level:Benign
    !Work with the Tables and set the ReturnValue
    !to Level:Fatal here if there are any errors.
    RETURN ReturnValue
```

Reset (remove all RelationManagers from transaction list)

Reset( )

Reset Remove all entries from the TransactionManager list queue.

Reset is used to remove all RelationManager objects that have been added to the TransactionManager's protected TransactionManagerQueue. In effect, the queue is freed, and any impending transaction processing will not occur. If a transaction is already in progress, the **Reset** method is ignored.

Implementation: Use the Reset method at any time prior to starting a transaction process if you need to cancel the entire operation for any reason.

RestoreLogout (restore all RelationManagers in transaction list to previous logout status)

RestoreLogout( )

RestoreLogout	Restores all RelationManager objects in the TransactionManager list queue to their original transaction status.

RestoreLogout will restore the respective UseLogout property set in each RelationManager involved in the transaction to its previous status.

Implementation: The Init method of the respective RelationManager sets the value of the UseLogout property. The ABC Templates set the UseLogout property based on the **Enclose RI code in transaction frame** check box in the **Global Properties** dialog. RestoreLogout sets this property to its previous status. Normally, this follows a call to the SetLogoutOff method.

See Also: UseLogout, SetLogoutOff

Run (initiates transaction sequence)

Run(*timeout* **)**

Run	Initiates the transaction sequence.
timeout	A numeric constant or variable specifying the number of seconds to attempt to begin the transaction for files contained in the target RelationManager objects before aborting the transaction and posting an error.

Run is used to initiate the TransactionManager transaction process. If the *timeout* value is not exceeded, the Start\Process\Finish-TransactionCommit or TransactionRollBack methods will be subsequently called.

Implementation: The Run method is not used by the ABC template chain. It is a method provided for developers who are writing custom source code using the TransactionManager.

SetLogoutOff (turn off logout for all RelationManagers in transaction list)

SetLogoutOff( )

SetLogoutOff Turn off default logout setting in all RelationManagers stored in TransactionManager list queue

SetLogoutOff is used to set the default logout setting in the appropriate RelationManager objects contained in the protected TransactionManagerQueue to OFF. This allows the TranactionManager to control the tranaction process through its own properties and methods.

Implementation: The SetLogoutOff method loops through the list of RelationManager objects listed by the TranactionManager, saves the appropriate status of the RelationManager's UseLogout property, and sets the UseLogout property to FALSE. It is internally called by the Start method, or may be called explicitly in a process where multiple transactions with batches of records may occur, and the continued call to the Start method for each batch does not need to continually reset the UseLogout property.

Example:

```
TransactionManager.Start        PROCEDURE()
I       LONG,AUTO
RetVal  BYTE,AUTO
 CODE
    IF SELF.TransactionRunning THEN RETURN Level:Fatal.
    IF SELF.AutoLogoutOff
       FREE(SELF.UselogoutList)
       SELF.LogoutOff = True
    END
    FREE(SELF.RMList)
    LOOP I=1 TO RECORDS(SELF.Files)
         GET(SELF.Files,I)
         IF NOT ERRORCODE()
            IF SELF.AutoLogoutOff
               SELF.SetLogoutOff(SELF.Files.RM)
            END
            RetVal = SELF.AddFileToLogout(SELF.Files.RM,SELF.Files.Cascade)
            IF RetVal<>Level:Benign
               BREAK
            END
         END
    END
```

SetTimeout (set timeout used in transaction)

SetTimeout(*seconds* **)**

SetTimout Sets the TransactionManager's LOGOUT timeout value.

timeout A numeric constant or variable specifying the number of seconds to attempt to begin the transaction for files contained in the target RelationManager objects before aborting the transaction and posting an error.

SetTimeout is used to set the TransactionManager's LOGOUT timeout value. The internal default value is 2 seconds.

Start (start the transaction)

Start( ),BYTE,VIRTUAL

Start Begin the transaction process.

Start is a virtual method used to begin the TransactionManager transaction process. **Start** makes sure that a transaction is not already running, clears the target RelationManager's internal UseLogout property, manages and issues a LOGOUT for all active tables contained in the target RelationManagers maintained by the TransactionManager.

If the initialization and LOGOUT statement are successful, **Start** returns a Level:Benign error level. If the **Start** method is for any reason unsuccessful, a Level:Fatal error level is returned.

Return Value: BYTE

Implementation: In a form (update) procedure, the **Start** method is called just prior to the Window Manager's TakeCompleted method. In a process procedure that implements the TransactionManager, the Start method can be called for each individual method processed, or can be called for a specified number of records processed.

Example:

```
!In a Form procedure
  IF SELF.Request<>ViewRecord
   ReturnValue = Transaction.Start()
   IF ReturnValue<>Level:Benign THEN RETURN ReturnValue.
  END
  ReturnValue = PARENT.TakeCompleted()
  ! A ReturnValue other than Level:Benign will rollback the transaction
  IF SELF.Request<>ViewRecord
   Transaction.Finish(ReturnValue)
  END

!In a process procedure that individually processes each record
ThisWindow.OpenReport PROCEDURE

ReturnValue          BYTE,AUTO

  CODE
  ReturnValue = PARENT.OpenReport()
  IF ReturnValue = Level:Benign
     ReturnValue = Transaction.Start()
  END
  RETURN ReturnValue
```

```
!In a process procedure that processes a batch of records
ThisProcess.TakeRecord PROCEDURE

ReturnValue          BYTE,AUTO

  CODE
  ReturnValue = PARENT.TakeRecord()
  ! ------------------------------------------------
  !
  ! Transaction Check Point
  ! The transaction will be saved till this point
  ! and a new one will be started
  !
  IF SELF.RecordsProcessed % 100 = 0
     Transaction.Finish(ReturnValue)
     IF ReturnValue = Level:Benign
        ReturnValue = Transaction.Start()
     END
  END
  ! ------------------------------------------------
  PUT(Process:View)
  IF ERRORCODE()
    GlobalErrors.ThrowFile(Msg:PutFailed,'Process:View')
    ThisWindow.Response = RequestCompleted
    ReturnValue = Level:Fatal
  END

  RETURN ReturnValue
```

TransactionCommit (commit the transaction)

TransactionCommit( ),VIRTUAL

TransactionCommit Commit (complete) the transaction process.

TransactionCommit is a virtual method used to complete the TransactionManager's transaction process by issuing a COMMIT statement. In addition, the UseLogout property of each RelationManager used in the transaction is restored to its previous state. It also checks to make sure if the transaction has already been completed.

Implementation: The **TransactionCommit** method is called by the Finish method if a Level:Benign error level has been posted.

Example:

```
TransactionManager.Finish       PROCEDURE(BYTE pErrorLevel)
 CODE
  IF NOT SELF.TransactionRunning THEN RETURN.
   IF pErrorLevel = Level:Benign
    SELF.TransactionCommit()
   ELSE
    SELF.TransactionRollBack()
   END
```

See Also: Finish, TransactionRollback, COMMIT

TransactionRollBack (rollback the transaction)

TransactionRollback( ),VIRTUAL

TransactionRollback Rollback (abort) the transaction process.

TransactionRollback is a virtual method used to abort the TransactionManager's transaction process by issuing a ROLLBACK statement. In addition, the UseLogout property of each RelationManager used in the transaction is restored to its previous state. It also checks to make sure if the transaction has already been completed.

Implementation: The **TransactionRollback** method is called by the Finish method if a Level:Fatal error level has been posted.

Example:

```
TransactionManager.Finish       PROCEDURE(BYTE pErrorLevel)
 CODE
  IF NOT SELF.TransactionRunning THEN RETURN.
   IF pErrorLevel = Level:Benign
    SELF.TransactionCommit()
   ELSE
    SELF.TransactionRollBack()
   END
```

See Also: Finish, TransactionCommit, ROLLBACK

TranslatorClass

TranslatorClass Overview

By default, the ABC Templates, the ABC Library, and the
Clarion visual source code formatters generate American English user interfaces. However, Clarion makes it very easy to efficiently produce non-English user interfaces for your application programs.

The TranslatorClass provides very fast runtime translation of user interface text. The TranslatorClass lets you deploy a single application that serves all your customers, regardless of their language preference. That is, you can use the TranslatorClass to display several different user interface languages based on end user input or some other runtime criteria, such as INI file or control file contents.

Alternatively, you can use the Clarion translation files (*.TRN) to implement a single non-English user inteface at compile time.

TranslatorClass Concepts

The TranslatorClass and the ABUTIL.TRN file provide a way to perform language translation at runtime. That is, you can make your program display one or more non-English user interfaces based on end user input or some other runtime criteria such as INI file or control file contents. You can also use the TranslatorClass to customize a single application for multiple customers. The TranslatorClass operates on all user interface elements including window controls, window titlebars, tooltips, list box headers, and static report controls.

The ABUTIL.TRN File

The ABUTIL.TRN file contains translation pairs for all the user interface text generated by the ABC Templates and the ABC Library. A translation pair is simply two text strings: one text string for which to search and another text string to replace the searched-for text. At runtime, the TranslatorClass applies the translation pairs to each user interface element.

You can directly edit the ABUTIL.TRN file to add additional translation items. We recommend this method for translated text common to several applications. The translation pairs you add to the Translator GROUP declared in ABUTIL.TRN are automatically shared by any application relying on the ABC Library and the ABC Templates.

Translating Custom Text

The default ABUTIL.TRN translation pairs do not include any custom text that you apply to your windows and menus. To translate custom text, you simply add translation pairs to the translation process, either at a global level or at a local level according to your requirements. To help identify custom text, the TranslatorClass automatically identifies any untranslated text for you; you need only supply the translation. See ExtractText for more information.

Macro Substitution

The TranslatorClass defines and translates macro strings. A TranslatorClass macro is simply text delimited by percent signs (%), such as %mymacro%. You may use a macro within the text on an APPLICATION, WINDOW, or REPORT control or titlebar, or you may use a macro within TranslatorClass translation pairs text.

You define the macro with surrounding percent signs (%), and you define its substitution value with a TranslatorClass translation pair (without percent signs).

This macro substitution capability lets you

- translate a small portion (the macro) of a larger text string
- do multiple levels of translation (a macro substitution value may also contain a macro)

See the Conceptual Example for more information.

TranslatorClass Relationship to Other Application Builder Classes

The WindowManager, PopupClass, and PrintPreviewClass optionally use the TranslatorClass to translate text at runtime. These classes do not require the TranslatorClass; however, if you want them to do runtime translation, you must include the TranslatorClass in your program. See the Conceptual Example.

TranslatorClass ABC Template Implementation

The ABC Templates instantiate a global TranslatorClass object for each application that checks the **Enable Run-Time Translation** box on the **Global Properties** dialog. See Template Overview--Application Properties for more information.

The TranslatorClass object is called Translator, and each template-generated procedure calls on the Translator object to translate all text for its APPLICATION, WINDOW or REPORT. Additionally, the template-generated PopupClass objects (ASCIIViewer and BrowseBox templates) and PrintPreviewClass objects (Report template) use the Translator to translate menu text.

Note: The ABC Templates use the TranslatorClass to apply user interface text defined at compile time. The templates do not provide a runtime switch between user interface languages.

TranslatorClass Source Files

The TranslatorClass source code is installed by default to the Clarion \LIBSRC folder. The TranslatorClass source code and its respective components are contained in:

ABUTIL.INC	TranslatorClass declarations
ABUTIL.CLW	TranslatorClass method definitions
ABUTIL.TRN	TranslatorClass default translation pairs

TranslatorClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a TranslatorClass object.

This example applies both default and custom translations to a "preferences" window. It also collects and stores untranslated text in a file so you don't have to manually collect the text to translate.

```
  PROGRAM
  INCLUDE('ABUTIL.INC')                !declare TranslatorClass
  MAP
  END

MyTranslations GROUP                   !declare local translations
Items       USHORT(4)                  !4 translations pairs
         PSTRING('Company')            ! item 1 text (macro)
         PSTRING('Widget %CoType%')    ! item 1 replacement text
         PSTRING('&Sound')             ! item 2 text
         PSTRING('&xSoundx')           ! item 2 replacement text
         PSTRING('&Volume')            ! item 3 text
         PSTRING('&xVolumex')          ! item 3 replacement text
         PSTRING('OK')                 ! item 4 text
         PSTRING('xOKx')               ! item 4 replacement text
        END
INIMgr     INIClass                    !declare INIMgr object
Translator  TranslatorClass            !declare Translator object
CoType    STRING('Inc.')               !default company type
Sound     STRING('ON ')                !default preference value
Volume    BYTE(3)                      !default preference value

PWindow WINDOW('%Company% Preferences'),AT(,,100,35),IMM,SYSTEM,GRAY
     CHECK('&Sound'),AT(8,6),USE(Sound),VALUE('ON','OFF')
     PROMPT('&Volume'),AT(31,19),USE(?VolumePrompt)
     SPIN(@s20),AT(8,20,21,7),USE(Volume),HVSCROLL,RANGE(0,9),STEP(1)
     BUTTON('OK'),AT(57,3,30,10),USE(?OK)
    END
 CODE
 INIMgr.Init('.\MyApp.INI')                    !initialize INIMgr object
 INIMgr.Fetch('Preferences','CoType',CoType)   !get company type, default Inc.
 Translator.Init                               !initialize Translator object:
                                               ! add default translation pairs
 Translator.AddTranslation(MyTranslations)     !add local translation pairs
 Translator.AddTranslation('CoType',CoType)    !add translation pair from INI
 Translator.ExtractText='.\MyApp.trn'          !collect user interface text
 OPEN(PWindow)
 Translator.TranslateWindow                    !translate controls & titlebar
```

```
ACCEPT
 IF EVENT() = EVENT:Accepted
  IF FIELD() = ?OK
   INIMgr.Update('Preferences','Sound',Sound)
   INIMgr.Update('Preferences','Volume',Volume)
   POST(EVENT:CloseWindow)
. . .
Translator.Kill                                !write user inteface text
```

TranslatorClass Properties

The TranslatorClass contains the following properties:

ExtractText (identify text to translate)

ExtractText CSTRING(File:MaxFilePath)

The **ExtractText** property contains the pathname of a file to receive a list of runtime user interface text to translate. If ExtractText contains a pathname, the TranslatorClass identifies, extracts, and writes the user interface text it encounters at runtime to the named file.

To generate a complete list of text to translate, assign a filename to the ExtractText property, compile and run your application, then open each procedure, menu, and option in the application. When you close the application, the TranslatorClass generates a sorted list of all the untranslated text items. You can then use this information to provide appropriate translations for the untranslated text. See AddTranslation for more information.

For applications that do dynamic text assignments based on data, you may even want to set the ExtractText property when you deploy your application, so you can collect the text that actually appears on end user screens based on the specific ways the end users work and the data they access.

Implementation: The ExtractText property defaults to blank. A value of blank does not extract untranslated text. A non-blank value extracts the text, and a valid pathname writes the untranslated text to the specified file.

See Also: AddTranslation

TranslatorClass Methods

The TranslatorClass contains the following methods:

AddTranslation (add translation pairs)

AddTranslation(| *group* | **)**

| *text, translation* |

AddTranslation	Adds translation pairs.
group	The label of a structure that contains one or more *text/translation* pairs.
text	A string constant, variable, EQUATE, or expression containing user interface text to search for. The TranslatorClass replaces each found *text* with its corresponding *translation*.
translation	A string constant, variable, EQUATE, or expression containing the replacement text for the corresponding *text*.

The **AddTranslation** method adds translation pairs to the runtime translation process.

The *text* is not limited to a single word; it may contain a phrase, or any text string, including TranslatorClass macros (see *TranslatorClass Concepts--Runtime Translation*).

Implementation: The *group* parameter must name a GROUP that *begins* the same as the TranslatorGroup structure declared in ABUTIL.INC:

```
TranslatorGroup GROUP,TYPE
Number          USHORT
                END
```

When you declare a translation *group*, be sure to set the correct number of translation pairs in the GROUP. For example:

```
MyAppTranslator GROUP
Pairs            USHORT(2)                          !2 translation pairs
                 PSTRING('&Insert')                 !begin 1st pair
                 PSTRING('&Agregar')                ! end 1st pair
                 PSTRING('Insert a new Record')     !begin 2nd pair
                 PSTRING('Agregar un nuevo Registro') !  end 2nd pair
                END
```

The TranslatorClass uses whole word, case sensitive matching to search for *text*. For example, 'Insert' does not match '&Insert' or 'INSERT' or 'Insert a new Record.'

The Init method uses the AddTranslation method to add the translation pairs declared in ABUTIL.TRN to the translation process.

The various "Translate" methods apply the translation pairs.

Example:

```
MyTranslations GROUP                        !declare local translations
Pairs           USHORT(4)                   !4 translations pairs
                PSTRING('&Sound')           ! item 1 text
                PSTRING('&xSoundx')         ! item 1 replacement text
                PSTRING('&Volume')          ! item 2 text
                PSTRING('&xVolumex')        ! item 2 replacement text
                PSTRING('Preferences')      ! item 3 text
                PSTRING('xPreferencesx')    ! item 3 replacement text
                PSTRING('OK')               ! item 4 text
                PSTRING('xOKx')             ! item 4 replacement text
               END
Translator           TranslatorClass        !declare Translator object
 CODE
 Translator.Init                            !initialize Translator object
                                            !add default translation pairs
 Translator.AddTranslation(MyTranslations) !add local translation pairs
 OPEN(MyWindow)
 Translator.TranslateWindow                 !translate all window controls
                                            ! and window titlebar
```

See Also: Init, TranslateControl, TranslatedControls, TranslateString, TranslateWindow

Init (initialize the TranslatorClass object)

Init

The **Init** method initializes the TranslatorClass object.

Implementation: The Init method uses the TranslatorClass.AddTranslation method to add the translation pairs declared in ABUTIL.TRN to the translation process.

Example:

```
Translator   TranslatorClass       !declare Translator object
 CODE
 Translator.Init                   !initialize Translator object:
                                   ! with default translation pairs
 !program code
 Translator.Kill                   !shut down Translator object
```

Kill (shut down the TranslatorClass object)

Kill

The **Kill** method frees any memory allocated during the life of the object and does any other required termination code.

Implementation: The Kill method writes out a list of untranslated text strings if the ExtractText property contains a valid INI file pathname.

Example:

```
Translator   TranslatorClass       !declare Translator object
 CODE
 Translator.Init                   !initialize Translator object:
                                   ! with default translation pairs
 !program code
 Translator.Kill                   !shut down Translator object
```

TranslateControl (translate text for a control)

TranslateControl(*control* [,*window*] **), VIRTUAL**

TranslateControl Translates text for a control.

control An integer constant, variable, EQUATE, or expression containing the control number of the control to translate.

window The label of the APPLICATION, WINDOW, or REPORT to translate. If omitted, TranslateControl operates on the active target.

The **TranslateControl** method translates the text for the specified *control*. The AddTranslation method sets the translation values for the control text.

Implementation: The TranslateControl method calls the TranslateString method for the specified control. Where applicable, the TranslateControl method translates MSG attribute text, TIP attribute text, and FORMAT attribute text.

The TranslateControl method does not translate USE variable contents; therefore it does not translate STRING controls that display a variable, nor the contents of ENTRY, SPIN, TEXT, or COMBO controls. You can use the TranslateString method to translate these elements if necessary.

Example:

```
PWindow WINDOW('Preferences'),AT(,,89,34),IMM,SYSTEM,GRAY
    CHECK('&Sound'),AT(8,6),USE(Sound),VALUE('ON','OFF')
    PROMPT('&Volume'),AT(31,19),USE(?VolumePrompt)
    SPIN(@s20),AT(8,20,21,7),USE(Volume),HVSCROLL,RANGE(0,9),STEP(1)
    BUTTON('OK'),AT(57,3,30,10),USE(?OK)
     END
 CODE
 OPEN(PWindow)
 Translator.TranslateControl(?Sound)          !translate Sound check box
 Translator.TranslateControl(?VolumePrompt)   !translate Volume prompt
 ACCEPT                                       !leave OK button
 END                                          ! and window title bar alone
```

See Also: AddTranslation, TranslateString

TranslateControls (translate text for range of controls)

TranslateControls(*first control, last control* [,*window*] **), VIRTUAL**

TranslateControls Translates text for a range of controls.

first control An integer constant, variable, EQUATE, or expression containing the control number of the first control to translate.

last control An integer constant, variable, EQUATE, or expression containing the control number of the last control to translate.

window The label of the APPLICATION, WINDOW, or REPORT to translate. If omitted, TranslateControl operates on the active target.

The **TranslateControls** method translates the text for each control between the *first control* and the *last control*, inclusive. The AddTranslation method sets the translation values for the control text.

Implementation: The TranslateControls method calls the TranslateControl method for each control with a USE attribute in the specified range. The TranslateControls method ignores controls with no USE attribute.

Example:

```
Pwindow WINDOW('Preferences'),AT(,,89,34),IMM,SYSTEM,GRAY
      CHECK('&Sound'),AT(8,6),USE(Sound),VALUE('ON','OFF')
      PROMPT('&Volume'),AT(31,19),USE(?VolumePrompt)
      SPIN(@s20),AT(8,20,21,7),USE(Volume),HVSCROLL,RANGE(0,9),STEP(1)
      BUTTON('OK'),AT(57,3,30,10),USE(?OK)
     END
 CODE
 OPEN(PWindow)
 Translator.TranslateControls(?Sound,?VolumePrompt) !translate ?Sound thru ?Volume
 ACCEPT                                             !leave OK button untranslated
 END
```

See Also: AddTranslation, TranslateControl

TranslateString (translate text)

TranslateString(*text* **), VIRTUAL**

TranslateString Translates a text string.

text A string constant, variable, EQUATE, or expression containing text to search for.

The **TranslateString** method returns the translation value for the specified *text*. The translation values and macro substitution values are set by the AddTranslation method.

Implementation: The TranslateString method uses whole word, case sensitive matching to search for *text*. For example, 'Insert' does not match '&Insert' or 'INSERT' or 'Insert a new Record.' If there is no translation value for the specified *text*, TranslateString returns *text*.

The TranslateString method implements the TranslatorClass macro substitution by translating any percent sign (%) delimited text it detects within its own return value.

Return Data Type: STRING

Example:

```
MyVar  STRING('Sound')
PWindow WINDOW('Preferences'),AT(,,89,34),IMM,SYSTEM,GRAY
         STRING(@s12),AT(8,30),USE(MyVar)
         BUTTON('OK'),AT(57,3,30,10),USE(?OK)
        END
 CODE
 OPEN(PWindow)
 MyVar=Translator.TranslateString(MyVar)  !translate USE variable contents
 ACCEPT
 END
```

See Also: AddTranslation

TranslateWindow (translate text for a window)

TranslateWindow([,*window*] **), VIRTUAL**

TranslateControls Translates text for each control on the WINDOW.

window The label of the APPLICATION, WINDOW, or REPORT to translate. If omitted, TranslateControl operates on the active target.

The **TranslateWindow** method translates the text for each control on the active target (APPLICATION, WINDOW, or REPORT). The AddTranslation method sets the translation values for the controls.

Implementation: The TranslateWindow method calls the TranslateControls method, specifying the entire range of controls on the window, except for menus and toolbars.

Example:

```
PWindow WINDOW('Preferences'),AT(,,89,34),IMM,SYSTEM,GRAY
       CHECK('&Sound'),AT(8,6),USE(Sound),VALUE('ON','OFF')
       PROMPT('&Volume'),AT(31,19),USE(?VolumePrompt)
       SPIN(@s20),AT(8,20,21,7),USE(Volume),HVSCROLL,RANGE(0,9),STEP(1)
       BUTTON('OK'),AT(57,3,30,10),USE(?OK)
     END
  CODE
  OPEN(PWindow)
  Translator.TranslateWindow ! translate all controls
 ACCEPT                      ! plus window titlebar
 END
```

See Also: AddTranslation, TranslateControls

ViewManager

ViewManager Overview

The ViewManager class manages a VIEW. The ViewManager gives you easy, reliable access to all the sophisticated power and speed of VIEWs, through its proven objects. So you get this speed and power without reinventing any wheels.

ViewManager Concepts

The management provided by the ViewManager includes defining and applying multiple sort orders, range limits (key based filters), and filters (non-key based) to the VIEW result set. It also includes opening, buffering, reading, and closing the VIEW. Finally, it includes priming and validating the view's primary file record buffer in anticipation of adding or updating records.

All these services provided by the ViewManager are applied to a VIEW--not a FILE. A VIEW may encompass some or all of the fields in one or more related FILEs. The VIEW concept is extremely powerful and perhaps essential in a client-server environment with normalized data. The VIEW lets you access data from several different FILEs as though from a single file, and it does so very efficiently. See VIEW in the *Language Reference* for more information.

In addition, the ViewManager supports buffering (some file drivers do not support buffering) which allows the performance of "browse" type procedures to be virtually instantaneous when displaying pages of records already read. Buffering (see BUFFER in the *Language Reference*) can also optimize performance when the file driver is a Client/Server back-end database engine (usually SQL-based), since the file driver can then optimize the calls made to the back-end database for minimum network traffic.

ViewManager Relationship to Other Application Builder Classes

The ViewManager relies on the FieldPairsClass and the RelationManager to do much of its work. Therefore, if your program instantiates the ViewManager it must also instantiate these other classes. Much of this is automatic when you INCLUDE the ViewManager header (ABFILE.INC) in your program's data section. See Field Pairs Classes and Relation Manager Class for more information. Also, see the Conceptual Example.

Perhaps more significantly, the ViewManager serves as the foundation of the BrowseClass and the ProcessClass. That is, both the BrowseClass and the ProcessClass are derived from the ViewManager.

BrowseClass--An Interactive VIEW

The BrowseClass implements an interactive VIEW that includes a visual display of records with scrolling, sorting, searching, and updating capabilities. See Browse Classes for more information.

ProcessClass--A Non-Interactive VIEW

The ProcessClass implements a batch (non-interactive) VIEW with sorting and updating capability, but no visual display and therefore no scrolling or searching capability. See Process Class for more information.

ViewManager ABC Template Implementation

The ViewManager serves as the foundation to the Browse procedure template, the Report procedure template, and the Process procedure template, because all these templates rely on VIEWs.

The BrowseClass and the ProcessClass are derived from the ViewManager, and the ABC Templates instantiate these derived classes; that is, the templates do not instantiate the ViewManager independently of the BrowseClass or ProcessClass. The Browse procedure template instantiates the BrowseClass, and the Process and Report procedure templates instantiate the ProcessClass.

ViewManager Source Files

The ViewManager source code is installed by default to ..\LIBSRC. The specific ViewManager files and their respective components are:

ABFILE.INC	ViewManager declarations
ABFILE.CLW	ViewManager method definitions

ViewManager Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a ViewManager object. This example simply establishes a VIEW with a particular sort order, range limit and filter, then processes the result set that fits the range and filter criteria.

```
 PROGRAM
    INCLUDE('ABFILE.INC')            !declare ViewManager class
    MAP                              !program map
    END

GlobalErrors  ErrorClass             !declare GlobalErrors object
View:Customer  ViewManager           !declare View:Customer object

Access:CUSTOMER CLASS(FileManager)   !declare Access:Customer object
Init            PROCEDURE
                END

Relate:CUSTOMER CLASS(RelationManager)!declare Relate:Customer object
Init            PROCEDURE
                END

CUSTOMER    FILE,DRIVER('TOPSPEED'),PRE(CUS),THREAD,BINDABLE
BYNUMBER     KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record       RECORD,PRE()
CUSTNO        LONG
NAME          STRING(30)
ZIP           DECIMAL(5)
             END
            END

Customer:View  VIEW(CUSTOMER) !declare Customer VIEW
               END

Low       LONG                !low end of range limit
High      LONG(1000)          !high end of range limit
ProgressMsg  STRING(60)

ProgressWindow WINDOW('Processing...'),AT(,,215,60),GRAY,TIMER(100)
                STRING(@S60),AT(1,21,210,10),USE(ProgressMsg),CENTER
                BUTTON('Cancel'),AT(87,37,45,14),USE(?Cancel)
               END
```

```
CODE
 GlobalErrors.Init             !initialize GlobalErrors object
 Relate:CUSTOMER.Ini           !initialize Relate:Customer object
 View:Customer.Init(Customer:View,Relate:CUSTOMER) !initialize View:Customer object
 View:Customer.AddSortOrder( CUS:BYNUMBER )        !add sort BYNUMBER
 View:Customer.AppendOrder( 'CUS:Name,CUS:ZIP' )   !add secondary sorts
 View:Customer.AddRange(CUS:CUSTNO,Low,High)       !add a range limit
 View:Customer.SetFilter( 'CUS:ZIP=33066','1')     !add filter #1
 Relate:CUSTOMER.Open                              !open customer & related files
 OPEN(ProgressWindow)                              !open the window
 ProgressMsg='Processing...'


ACCEPT
  CASE EVENT()
  OF Event:OpenWindow
   View:Customer.Reset(1)               !open view, apply range & filter
  OF Event:Timer
   CASE View:Customer.Next()            !get next view record
   OF Level:Notify                      !if end of file, stop
    POST(EVENT:CloseWindow)
    BREAK
   OF Level:Fatal                       !if fatal error, stop
    POST(EVENT:CloseWindow)
    BREAK
   END
   CUS:ZIP=33065                        !process the record
   IF Relate:CUSTOMER.Update()          !update customer & related files
    BREAK
   ELSE
    ProgressMsg = CLIP(CUS:Name)&' zip changed to '&CUS:ZIP
    DISPLAY(ProgressMsg)
   END
  END
  IF FIELD() = ?Cancel                  !if user cancelled, stop
   IF EVENT() = Event:Accepted
    POST(Event:CloseWindow)
   END
  END
 END
 Relate:CUSTOMER.Close                 !close customer & related files
 View:CUSTOMER.Kill                    !shut down View:Customer object
 Relate:CUSTOMER.Kill                  !shut down Relate:Customer object
 GlobalErrors.Kill                     !shut down GlobalErrors object
```

```
Access:CUSTOMER.Init PROCEDURE
 CODE
 PARENT.Init(Customer,GlobalErrors)
 SELF.FileNameValue = 'CUSTOMER.TPS'
 SELF.Buffer &= CUS:Record
 SELF.AddKey(CUS:BYNUMBER,'CUS:BYNUMBER',1)
 SELF.LazyOpen = False

Relate:CUSTOMER.Init PROCEDURE
 CODE
 Access:CUSTOMER.Init
 PARENT.Init(Access:CUSTOMER,1)
```

ViewManager Properties

The ViewManager properties include references to the specific view being managed, as well as several flags or switches that tell the ViewManager how to manage the referenced view.

The references are to the VIEW, the primary FILE's RelationManager object, and the VIEW's sort information. These references allow the otherwise generic ViewManager object to process a specific view.

The processing switches include buffering parameters that allow asynchronous read-ahead buffering of pages and saving pages of already read records. This buffering provides instant response for procedures displaying pages of records already read, and can also minimize network traffic for Client/Server programs by reducing packets.

Each of these properties is fully described below.

Order (sort, range-limit, and filter information)

Order &SortOrder, PROTECTED

The **Order** property is a reference to a structure that contains the sort, range, and filter information for the managed VIEW. The ViewManager methods use this information to sort, range limit, and filter the VIEW result set.

Several ViewManager methods affect the contents of the Order property, including AddSortOrder, AddRange, AppendOrder, and SetFilter. The SetOrder method overrides a particular sort order, and the SetSort method determines which sort order is current for the underlying VIEW.

Implementation: The Order property is a reference to QUEUE declared in ABFILE.INC:

```
FilterQueue QUEUE,TYPE
ID          STRING(30)      !sorted to indicate priority
Filter      &STRING         !filter expression
            END

SortOrder   QUEUE,TYPE     !sort & filter information
Filter       &FilterQueue  !ANDed list of filter expressions
FreeElement  ANY           !the Free key element
LimitType    BYTE          !range limit type flag
MainKey      &KEY          !the main KEY
Order        &STRING       !ORDER expression list
RangeList    &BufferedPairsClass !list of fields in range limit
            END
```

See Also: AddSortOrder, AddRange, AppendOrder, SetFilter, SetOrder, SetSort

PagesAhead (buffered pages)

PagesAhead USHORT

The **PagesAhead** property controls automatic record set buffering for the managed view (see *BUFFER* in the *Language Reference*). Some file drivers do not support buffering. PagesAhead specifies the number of additional "pages" of records to read ahead of the currently displayed page.

Implementation: The Init method sets the PagesAhead property to zero (0). The Open method implements the buffering specified by the PagesAhead, PagesBehind, PageSize, and TimeOut properties.

See Also: Init, Open, PagesBehind, PageSize, TimeOut

PagesBehind (buffered pages)

PagesBehind USHORT

The **PagesBehind** property controls automatic record set buffering for the managed view (see *BUFFER* in the *Language Reference*). Some file drivers do not support buffering. PagesBehind specifies the number of "pages" of already read records to save.

Implementation: The Init method sets the PagesBehind property to two (2). The Open method implements the buffering specified by the PagesAhead, PagesBehind, PageSize, and TimeOut properties.

See Also: Init, Open, PagesAhead, PageSize, TimeOut

PageSize (buffer page size)

PageSize USHORT

The **PageSize** property controls automatic record set buffering for the managed view (see *BUFFER* in the *Language Reference*). Some file drivers do not support buffering. PageSize specifies the number of records in a buffer "page."

Implementation: The Init method sets the PageSize property to twenty(20). The Open method implements the buffering specified by the PagesAhead, PagesBehind, PageSize, and TimeOut properties.

See Also: Init, Open, PagesAhead, PagesBehind, TimeOut

Primary (the primary file RelationManager)

Primary &RelationManager, PROTECTED

The **Primary** property is a reference to the RelationManager object for the managed VIEW's primary file. The ViewManager methods use this property to enforce relational integrity constraints among related files within the managed VIEW.

The ViewManager.Init method sets the value of the Primary property.

See Also: Init

SavedBuffers (saved record buffers)

SavedBuffers &BuffersQueue, PROTECTED

The **SavedBuffers** property contains references to saved copies of the record buffer for the managed view. The saved record images may be used to detect changes by other workstations, to implement cancel operations, etc.

Implementation: The SaveBuffers method stores a copy of the current Buffer contents into the SavedBuffers property.

The RestoreBuffers method releases memory allocated by the SaveBuffers method. Therefore, to prevent a memory leak, each call to SaveBuffers should be paired with a corresponding call to RestoreBuffers.

SavedBuffers is a reference to a QUEUE declared in ABFILE.INC as follows:

```
BuffersQueue QUEUE,TYPE    !Saved records
Id           USHORT        !Handle to recognize saved instance
FM           &FileManager  !Reference to the FileManager Class
             END
```

See Also: SaveBuffers, Restore Buffers

TimeOut (buffered pages freshness)

TimeOut USHORT

The **TimeOut** property controls automatic record set buffering for the managed view (see *BUFFER* in the *Language Reference*). Some file drivers do not support buffering.

TimeOut specifies the number of seconds the buffered records are considered "trustworthy" in a network environment. If the TimeOut period has expired, the VIEW fills a request for records from the backend database rather than from the buffer.

Implementation: The Init method sets the TimeOut property to sixty (60). The Open method implements the buffering specified by the PagesAhead, PagesBehind, PageSize, and TimeOut properties.

See Also: Init, Open, PagesAhead, PagesBehind, PageSize

View (the managed VIEW)

View &VIEW

The **View** property is a reference to the managed VIEW. The View property simply identifies the managed VIEW for the various ViewManager methods.

The ViewManager.Init method sets the value of the View property.

See Also: Init

ViewManager Methods

The ViewManager contains the following methods.

ViewManager Functional Organization--Expected Use

As an aid to understanding the ViewManager, it is useful to organize its methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the ViewManager methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the ViewManager object
AddRange	add a range limit to the active sort order
AddSortOrder	add a sort order
AppendOrder	refine the active sort order
Kill[v]	Shut down the ViewManager object

Mainstream Use:

Open[v]	open the VIEW
Next[v]	get the next element
Previous[v]	get the previous element
PrimeRecord	prepare a record for adding
ValidateRecord[v]	validate the current element
SetFilter[v]	specify a filter for the active sort order
SetSort[v]	set the active sort order
Close[v]	close the VIEW

Occasional Use:

SetOrder[v]	replace the active sort order
UseView	use LazyOpen files

[v] These methods are also Virtual.

Virtual Methods

Typically, you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Open	open the VIEW
Next	get the next element
Previous	get the previous element
Reset	reset the VIEW position
SetSort	set the active sort order
SetFilter	specify a filter for the active sort order
SetOrder	replace the active sort order
ApplyFilter	range limit and filter the result set
ApplyOrder	sort the result set
ApplyRange	range limit & filter the result set
ValidateRecord	validate the current element
GetFreeElementName	return the free element field name
GetFreeElementPosition	return the free element field position
Close	close the VIEW
Kill	shut down the ViewManager object

AddRange (add a range limit)

AddRange(*field* |[*,min limit* [*,max limit*]] | **)**

| *,primaryrelation, parentrelation* |

AddRange	Specifies a sort-specific range limit.
field	The label of the field to limit. This need not be a component of a KEY or INDEX, but VIEW performance is substantially faster if it is.
min limit	A constant, variable, EQUATE, or expression that specifies the value, or the lower end of a range of values, to which the *field* is limited. If omitted, the *field* is limited to its current value.
max limit	A constant, variable, EQUATE, or expression that specifies the upper end of an inclusive range of values to which the *field* is limited. The lower end of the inclusive range is specified by *min limit*. If *max limit* is omitted, the *field* is limited to the value of *min limit*.
primaryrelation	The label of the RelationManager object for the managed VIEW's primary file. This limits all available linking fields to their current values in the corresponding parent file fields.
parentrelation	The label of the RelationManager object for the primary file's parent file. The ViewManager uses this object to get the limiting values from the parent file for a file-relationship range limit.

The **AddRange** method specifies a sort-specific range limit that may be applied to the VIEW when the range limit's sort order is active. When the range limit is applied, only those records whose *field* contains the specified value(s) are included in the result set. You may specify only one range limit per sort order.

Implementation: The AddSortOrder method adds a sort order. The ApplyRange method applies the active sort order's range limit. The SetSort method sets the active sort order.

AddRange ignores the *field* parameter when the *primaryrelation* parameter is present.

Example:

```
MyView.AddSortOrder(ORD:ByCustomer)                          !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
MyView.AddSortOrder(ORD:ByOrder)                             !sort by order no
MyView.AddRange(ORD:OrderNo)                                 !range limit by current
                                                             !value of ORD:OrderNo
```

See Also: AddSortOrder, ApplyRange, SetSort

AddSortOrder (add a sort order)

AddSortOrder([*key*] **), PROC**

AddSortOrder Specifies a sort order for the ViewManager object.

key The label of the primary file KEY on which to sort. If omitted, the ViewManager processes in record order.

The **AddSortOrder** method specifies a sort order for the ViewManager object and returns a number identifying the sequence in which the sort order was added.

Only one sort order is active at a time. The SetSort method sets the active sort order based on the sequence numbers returned by AddSortOrder.

Implementation: You may specify multiple sort orders by calling AddSortOrder multiple times. The first call to AddSortOrder returns one (1), the second call returns two (2), etc.

Return Data Type: BYTE

Example:

```
CustSort = MyView.AddSortOrder(ORD:ByCustomer)            !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
OrderSort = MyView.AddSortOrder(ORD:ByOrder)              !sort by order no
MyView.AddRange(ORD:OrderNo)                              !range limit by current
                                                          !value of ORD:OrderNo

!program code
IF MyView.SetSort(CustSort)                               !set active sort order
 DISPLAY                                                  !if changed, refresh
END
```

See Also: SetSort

AppendOrder (refine a sort order)

AppendOrder(*expression list* **), VIRTUAL**

AppendOrder Refines the active sort order for the ViewManager object.

expression list A string constant, variable, EQUATE, or expression that contains an ORDER expression list. See the *Language Reference--ORDER* for more information.

The **AppendOrder** method refines or extends the active sort order for the ViewManager object.

The SetSort method sets the active sort order.

Implementation: The ViewManager implements sort orders with the VIEW's ORDER attribute. The AppendOrder method appends the *expression list* to the active sort order's expression list. You do not need to prepend a comma or other separator to the *expression list*. Prepending the expression list with a "*" completely replaces a previously appended sort order..

Example:

```
MyView.AddSortOrder(ORD:ByCustomer)          !sort by customer no
MyView.AppendOrder('CUST:CustName')          !and customer name
```

See Also: AddSortOrder, SetSort

ApplyFilter (range limit and filter the result set)

ApplyFilter, VIRTUAL

The **ApplyFilter** method applies the range limits and filter for the active sort order to the managed VIEW. The filter applies starting with the next read.

The AddSortOrder and SetSort methods set the active sort order. The SetFilter method sets filter expression.

Implementation: The ViewManager implements range limits and filters with the VIEW's FILTER attribute. See the *Language Reference--FILTER* for more information.

Example:

```
MyView.AddSortOrder(ORD:ByCustomer)                          !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
MyView.SetFilter( '(CUST:Name>''T'')' )                      !set customer name filter
!program code
MyView.ApplyFilter                                           !apply the filter
MyView.Next()                                                !get next subject to filter
```

See Also: SetFilter, SetSort

ApplyOrder (sort the result set)

ApplyOrder, VIRTUAL

The **ApplyOrder** method applies the active sort order to the managed VIEW. The order applies starting with the next read from the VIEW.

The AddSortOrder method sets the available sort orders.The SetSort method sets the active sort order.

Implementation: The ViewManager implements sort orders with the VIEW's ORDER attribute. See the *Language Reference--ORDER* for more information.

Example:

```
MyView.AddSortOrder(ORD:ByCustomer)          !sort by customer no
!program code
MyView.ApplyOrder                            !apply the order
MyView.Next()                                !get next in specified order
```

See Also: AddSortOrder, SetSort

ApplyRange (conditionally range limit and filter the result set)

ApplyRange, VIRTUAL, PROC

The **ApplyRange** method applies the range limits and calls the ApplyFilter method if the range limits have changed. The ApplyRange method returns a value indicating whether or not a change occurred. A return value of one (1 or True) indicates a change; a return value of zero (0 or False) indicates no change.

The AddRange method specifies the range limits for the ViewManager object. The SetSort method sets the active sort order.

Implementation: The ApplyRange method applies range limits and filters with the ApplyFilter method.

Return Data Type: BYTE

Example:

```
MyView.AddSortOrder(ORD:ByCustomer)                          !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
!program code
MyView.ApplyRange                                            !apply the range limit
MyView.Next()                                                !get next, subject to range
```

See Also: SetSort ,AddRange, ApplyFilter

Close (close the view)

Close (<*force*> **), VIRTUAL**

The **Close** method closes the managed VIEW.

Normally, a VIEW is closed by the **Close** method, providing that it was opened with the Open method. The *force* flag is used to close a VIEW that was not originally opened by the ViewManagers's Open method

Example:

```
MyView.AddSortOrder(ORD:ByCustomer)                          !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
MyView.Open                                                  !open the view
!program code
MyView.Close                                                 !close the view
```

GetFirstSortField (return first field of current sort)

GetFirstSortField

The **GetFirstSortField** method returns the first field that contains the current sort. If there is no current sort active, the **GetFirstSortField** method returns a NULL.

Implementation: The BrowseClass uses the GetFirstSortField method to prime the BrowseClass.SetLocatorField method.

Return Data Type: ANY

GetFreeElementName (return free key element name)

GetFreeElementName

The **GetFreeElementName** method returns the fully qualified field name of the first sort field in the active sort order that is not limited to a single value by the applied range limit. For example, consider a VIEW sorted by Customer, Order, and Item, with the Customer field range limited to its current value. The free element is the Order field. But remove the range limit, and the free element is the Customer field.

The AddSortOrder method sets the key/sort order for the VIEW. The SetSort method sets the active sort order. The AddRange method adds range limits.

Implementation: The FilterLocatorClass uses the GetFreeElementName method to refresh the window.

Return Data Type: STRING

Example:

```
BuildFilter PROCEDURE(STRING filter)
FieldName  CSTRING(100)
 CODE
 FieldName = MyView.GetFreeElementName()              !get filterable field name
 MyView.SetFilter(FieldName&'[1] = '''&filter[1]&''''')!set a filter expression
 MyView.ApplyFilter()                                 !apply the filter expression
```

See Also: AddRange, AddSortOrder, SetSort

GetFreeElementPosition (return free key element position)

GetFreeElementPosition, PROTECTED, VIRTUAL

The **GetFreeElementPosition** method returns the position of the first sort field in the active sort order that is not limited to a single value by the applied range limit. For example, consider a VIEW sorted by Customer, Order, and Item, with the Customer field range limited to its current value. The free element is the Order field. But remove the range limit, and the free element is the Customer field.

The AddSortOrder method sets the key/sort order for the VIEW. The SetSort method sets the active sort order. The AddRange method adds range limits.

Implementation: The BrowseClass.TakeKey method uses the GetFreeElementPosition method to reposition the VIEW based on the fixed key elements. The GetFreeElementName method uses the GetFreeElementPosition method to find the free element name.

Return Data Type: BYTE

Example:

```
BrowseClass.TakeKey PROCEDURE

!method code
 IF SELF.Sort.Locator.TakeKey()
  Handled = 1
  SELF.Reset(SELF.GetFreeElementPosition())
  SELF.ResetQueue(Reset:Done)
 ELSE
  SELF.ListControl{PROP:SelStart} = SELF.CurrentChoice
 END
```

See Also: GetFreeElementName, BrowseClass.TakeKey

Init (initialize the ViewManager object)

Init(*view, primaryrelation* [, *order*] **)**

Init	Initializes the ViewManager object.
view	The label of the managed VIEW.
primaryrelation	The label of the RelationManager object for the *view*'s primary file.
order	A structure containing the sort, range limit, and filter information for the managed VIEW. If omitted, the Init method supplies an empty SortOrder structure that may be set up with AddSortOrder, AppendOrder, SetOrder, AddRange, and SetFilter methods.

The **Init** method initializes the ViewManager object.

Implementation: The Init method sets the values of the Order, PagesAhead, PagesBehind, PageSize, Primary, and View properties.

The *order* parameter allows derived classes, such as the BrowseClass, to add additional sort information to their underlying views.

By passing the Order property from another ViewManager object or the Sort property from a BrowseClass object as the *order* parameter, you can implement several objects with similar sorts, filters, and range limits.

Example:

```
MyView.Init(OrderView,Relate:Order)!initialize the ViewManager
MyView.Open                        !open the view
!program code
MyView.Close                       !close the view
MyView.Kill                        !shut down the ViewManager
```

See Also: Order, Primary, View, PagesAhead, PagesBehind, PageSize

Kill (shut down the ViewManager object)

Kill, VIRTUAL

The **Kill** method shuts down the ViewManager object by freeing any memory allocated during the life of the object and executing any other required termination code.

Example:

```
MyView.Init(OrderView,Relate:Order)                          !initialize the ViewManager
MyView.AddSortOrder(ORD:ByCustomer)                          !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
MyView.Open                                                  !open the view
!program code
MyView.Close                                                 !close the view
MyView.Kill                                                  !shut down the ViewManager
```

Next (get the next element)

Next, VIRTUAL

The **Next** method gets the next VIEW element, subject to the applied sort order, range limit, and filter, and returns a value indicating its success or failure.

If Next succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns Level:Notify or Level:Fatal depending on the error encountered. See *Error Class* for more information on severity levels.

Implementation: The Next method uses the ValidateRecord method to validate records that are not filtered out.

Return Data Type: BYTE

Example:

```
CASE MyView.Next()                !try to get the next record
OF Level:Benign                   !& check for success
 !process the record
OF Level:Notify                   !& check for failure
 !write error log
OF Level:Fatal                    !& check for fatality
 POST(Event:CloseWindow)
 BREAK
END
```

See Also: ValidateRecord

Open (open the view)

Open, VIRTUAL

The **Open** method opens the managed VIEW.

Implementation: The Open method opens the view *and* applies the active sort order and filter with the ApplyOrder and ApplyFilter methods. The Open method applies the buffering specified by the PagesAhead, PagesBehind, PageSize, and TimeOut properties.

Example:

```
MyView.AddSortOrder(ORD:ByCustomer)                          !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
MyView.Open                                                  !open the view
!program code
MyView.Close                                                 !close the view
```

See Also: ApplyFilter, ApplyOrder, PagesAhead, PagesBehind, PageSize, TimeOut

Previous (get the previous element)

Previous, VIRTUAL

The **Previous** method gets the previous VIEW element, subject to the applied sort order, range limit, and filter, and returns a value indicating its success or failure.

Implementation: If Previous succeeds, it returns Level:Benign (declared in ABERROR.INC). If it fails, it returns Level:Notify or Level:Fatal depending on the error encountered. See *Error Class* for more information on severity levels.

The Previous method uses the ValidateRecord method to validate records that are not filtered out.

Return Data Type: BYTE

Example:

```
CASE MyView.Previous()          !try to get the previous record
OF Level:Benign                 !& check for success
 !process the record
OF Level:Notify                 !& check for failure
 !write error log
OF Level:Fatal                  !& check for fatality
 POST(Event:CloseWindow)
 BREAK
END
```

See Also: ValidateRecord

PrimeRecord (prepare a record for adding:ViewManager)

PrimeRecord([*suppress clear*] **), VIRTUAL**

PrimeRecord Prepares the VIEW's primary file record buffer to add a new record.

suppress clear An integer constant, variable, EQUATE, or expression that indicates whether or not to clear the record buffer. A value of zero (0 or False) clears the buffer; a valueof one (1 or True) does not clear the buffer. If omitted, *suppress clear* defaults to zero (0).

The **PrimeRecord** method prepares the VIEW's primary file record buffer with initial values to add a new record.

Implementation: The PrimeRecord method uses the primary file's FileManager.PrimeRecord method to prime the record. Then it uses any applicable range limit information to prime other fields. The *suppress clear* parameter lets you clear or retain any other values in the record buffer.

Example:

```
CASE FIELD()
OF ?InsertButton              !on insert button
 CASE EVENT()
 OF EVENT:Accepted            !if insert clicked
  MyView.PrimeRecord          !prime the record for adding
  !insert the new record
 END
END
```

See Also: FileManager.PrimeRecord

Reset (reset the view position)

Reset([*number*] **), VIRTUAL**

Reset	Resets the VIEW position.
number	An integer constant, variable, EQUATE, or expression that specifies the start position based on the contents of the first *number* components of the applicable ORDER attribute. If omitted, Reset positions the VIEW to the first element in theVIEW's result set.

The **Reset** method resets the VIEW position to the beginning of the result set specified by the VIEW's applied sort order, range limit and filter. The *number* parameter further refines the position by considering the *contents* of the first *number* expressions in the active sort order.

For example, consider a VIEW sorted by Customer where Customer's value is ten(10). If *number* is omitted, Reset positions to the element with the lowest Customer value, regardless of Customer's value. However, if *number* is one (1), Reset positions to the first element with a Customer value of ten (10).

Implementation: The Reset method calls the Open method and SETs the managed VIEW. See the *Language Reference--SET* for more information.

Example:

```
View:Customer.Init(Customer:View,Relate:CUSTOMER) !initialize View:Customer object
View:Customer.AddSortOrder( CUS:BYNUMBER )        !add sort BYNUMBER
View:Customer.AddRange(CUS:CUSTNO,Low,High)       !add a range limit
View:Customer.SetFilter( 'CUS:ZIP=33064','1')     !add filter #1
Relate:CUSTOMER.Open                              !open customer & related files
View:Customer.Reset                               !open view, apply range & filter
IF View:Customer.Next()                           !get first view record
 HALT                                             !if no records, stop
END
```

See Also: Open

RestoreBuffers (restore VIEW file buffers)

RestoreBuffers( ), VIRTUAL

RestoreBuffers Restores the contents of a VIEW's file buffers.

The **RestoreBuffers** method restores the current file buffer's contents specified by the view from an internal queue as defined by the *SavedBuffers* property.

See Also: SaveBuffers

SaveBuffers (save VIEW file buffers)

SaveBuffers( ), VIRTUAL

SaveBuffers Saves the contents of a VIEW's file buffers.

The **SaveBuffers** method saves the current file buffer's contents specified by the view to an internal queue defined by the *SavedBuffers* property.

See Also: RestoreBuffers

SetFilter (add, change, or remove active filter)

SetFilter(*expression* [*, id*] **), VIRTUAL**

SetFilter	Specifies a filter for the active sort order.
expression	A string constant, variable, EQUATE, or expression that contains a FILTER expression. See *FILTER* in the *Language Reference* for more information. If *expression* is null (''), SetFilter deletes any existing filter with same *id*.
id	A string constant, variable, EQUATE, or expression that uniquely identifies (and prioritizes) the filter so you can apply multiple filter conditions, and so you can replace or remove filter conditions with with subsequent calls to SetFilter. If omitted, the filter gets a default id so that subsequent calls to SetFilter with no *id* replace the filter *expression* set by prior calls to SetFilter with no *id*.

The **SetFilter** method specifies a filter for the active sort order. When the filter is applied, the view only includes those elements whose *expression* evaluates to true.

The *id* parameter lets you specify multiple filter *expression*s or replace a specific *expression* by its *id*. If you set several *expression*s, each with a unique id, then all those *expression*s must evaluate to true to include an item in the result set.

The ViewManager evaluates the *expression*s in *id* order, so it is efficient to prioritize *expression*s most likely to fail; for example:

```
MyView.SetFilter('TaxPayer=True','9Tax')      !low priority expression
MyView.SetFilter('LotteryWinner=True','1Lot') !high priority expression
!evaluates as: (LotteryWinner=True) AND (TaxPayer=True)
```

The ApplyFilter and ApplyRange methods apply the active sort order's filter. The SetSort method sets the active sort order.

Implementation: The ViewManager uses the *id* to indicate the priority of the *expression*. The priority is implemented by sorting the list of filter expressions by the *id*. The *id* is truncated after 30 characters. If omitted, *id* defaults to '5 Standard' which specifies a medium priority filter that is replaced by any subsequent calls to SetFilter with *id* omitted (or '5 Standard') and with the same active sort order.

Each call to SetFilter with a unique *id* parameter adds to the filter expression for the active sort order. Multiple expressions added in this fashion are joined with the boolean AND operator.

The SetFilter method adds the filter *id* and *expression* to the Order property.

Example:

```
MyView.AddSortOrder(ORD:ByOrder)                        !order no. sort (1)
MyView.SetFilter('(ORD:OrdNo=CUST:OrdNo)','1OrderNo')!filter on OrderNo
MyView.SetFilter('(ORD:Date='&TODAY()&')','1Date')   !AND on date. Date test applied
                                                        !first because it sorts first
MyView.AddSortOrder(ORD:ByName)                         !customer name sort (2)
MyView.SetFilter('CUST:Name[1]=''A''')                  !filter on cust name

!program code
MyView.SetSort(2)                                       !sort by customer name
MyView.SetFilter('CUST:Name[1]=''J''')                  !new filter on cust name
                                                        !replaces prior name filter
```

See Also: AddSortOrder, Order

SetOrder (replace a sort order)

SetOrder(*expression list* **), VIRTUAL**

SetOrder	Replaces the active sort order.
expression list	A string constant, variable, EQUATE, or expression that contains an ORDER attribute expression list. See the *Language Reference--ORDER* for more information.

The **SetOrder** method replaces the active sort order for the ViewManager object.

The SetSort method sets the active sort order.

Implementation: The ViewManager implements sort orders with the VIEW's ORDER attribute. The SetOrder method replaces the active sort order's expression list with the *expression list*.

Example:

```
 MyView.AddSortOrder(ORD:ByCustomer)            !sort by customer no
 !program code
 MyView.SetOrder(CUST:CustName)                 !sort by customer name

ThisWindow.OpenReport PROCEDURE
ReturnValue          BYTE,AUTO

  CODE
 SELF.Process.SetFilter(CHOOSE(CHOICE(?List1),'','PEO:Gender=''M''',|
                     'PEO:Gender=''F'''))
 SELF.Process.SetOrder(CHOOSE(CHOICE(?List2),'PEO:Id','PEO:LastName',|
                     'PEO:FirstName','PEO:Gender'))
  EXECUTE(CHOICE(?List3))
    SELF.Report &= Report
    BEGIN
      SELF.Report &= Report1
      RecordsPrinted = 0
      SELF.PrePass = 1 - SELF.PrePass
    END
    SELF.Report &= Report2
  END
  ReturnValue = PARENT.OpenReport()
  RETURN ReturnValue
```

See Also: SetSort

SetSort (set the active sort order)

SetSort(*sortnumber* **), VIRTUAL**

SetSort	Set the view's active sort order.
sortnumber	An integer constant, variable, EQUATE, or expression that specifies the sort order to use. Sort orders are numbered in the sequence they are added by the AddSortOrder method.

The **SetSort** method sets the view's active sort order and returns a value indicating whether the active sort (*sortnumber*) changed.

Implementation: SetSort returns one (1) if the *sortnumber* changed; otherwise it returns zero (0).

Return Data Type: BYTE

Example:

```
CustSort = MyView.AddSortOrder(ORD:ByCustomer)    !sort by customer no
MyView.AddRange(ORD:CustNo,Relate:Orders,Relate:Customer) !range limit by parent file
OrderSort = MyView.AddSortOrder(ORD:ByOrder)      !sort by order no
MyView.AddRange(ORD:OrderNo)                      !range limit by current
                                                  !value of ORD:OrderNo

!program code
IF MyView.SetSort(CustSort)                       !set active sort order
 MESSAGE('New Sort Order')                        !acknowledge new order
END
```

See Also: AddSortOrder

UseView (use LazyOpen files)

UseView, PROTECTED

The **UseView** method notifies ABC Library objects that the files in the managed view whose opening was delayed by the LazyOpen property are about to be used.

Implementation: The Init and Open methods call the UseView method. The UseView method calls FileManager.UseFile for each file in the managed view.

Example:

```
ViewManager.Open PROCEDURE
 CODE
 IF ~SELF.Opened
  ASSERT(RECORDS(SELF.Order))
  SELF.UseView()                    !really open files
  OPEN(SELF.View)
  IF ERRORCODE()
   SELF.Primary.Me.Throw(Msg:ViewOpenFailed)
  END
  BUFFER(SELF.View,SELF.PageSize,SELF.PagesBehind,SELF.PagesAhead,SELF.TimeOut)
  SELF.Opened = 1
  SELF.ApplyOrder
  SELF.ApplyFilter
 END
```

See Also: Init, Open, FileManager.LazyOpen, FileManager.UseFile

ValidateRecord (validate an element)

ValidateRecord, VIRTUAL

The **ValidateRecord** method validates the current VIEW element and returns a value indicating whether or not the data is valid. A return value of zero (0) indicates the item is valid; any other value indicates the item is invalid.

Implementation: The ValidateRecord is a virtual placeholder for derived class methods.

The Next and Previous methods call the ValidateRecord method.

Return values are declared in ABFILE.INC as follows:

```
 ITEMIZE(0),PRE(Record)
OK         EQUATE    !Record passes range and filter
OutOfRange EQUATE    ! Record fails range test
Filtered   EQUATE    ! Record fails filter tests
 END
```

Return Data Type: BYTE

Example:

```
ViewManager.Next PROCEDURE
  CODE
 LOOP
  NEXT(SELF.View)
  IF ERRORCODE()
   IF ERRORCODE() = BadRecErr
    RETURN Level:Notify
   ELSE
    SELF.Primary.Me.Throw(Msg:AbortReading)
    RETURN Level:Fatal
   END
  ELSE
   CASE SELF.ValidateRecord()
   OF Record:OK
    RETURN Level:Benign
   OF Record:OutOfRange
    RETURN Level:Notify
   END
  END
 END
```

See Also: Next, Previous

WindowComponent Interface

WindowComponent Overview

The WindowComponent interface is used with the WindowManager to provide an program efficient way of the window's components to communicate easily with the WindowManager. Methods common to all components are included with the interface, including event handling (TakeEvent), initialization and refreshing the components and window itself (Reset, Update), and general housekeeping (Buffer Save and Restore, Kill).

WindowComponent Concepts

The WindowComponent interface defines a set of common methods an object must implement in order for the object to plug into the window.

Although all of the classes that implement the WindowComponent interface must implement all of the methods, that does not mean that all need to do something.

Relationship to Other Application Builder Classes

The BrowseClass, FileDropClass, BrowseToolbarClass, FormVCRClass, HistHandlerClass, and RecipientControl all implement the WindowComponent interface.

WindowComponent Source Files

The WindowComponent source code is installed by default to the Clarion \LIBSRC folder. The specific WindowComponent source code and their respective components are contained in:

ABWINDOW.INC	WindowComponent interface declaration
ABBROWSE.CLW	BrowseClass.WindowComponent method definitions
ABDROPS.CLW	FileDropClass.WindowComponent method definitions
ABDST.CLW	RecipientControl.WindowComponent method definitions
ABERROR.CLW	HistHandler.WindowComponent method definitions
ABTOOLBA.CLW	BrowseToolbarClass.WindowComponent method definitions
ABVCRFRM.CLW	FormVCRClass.WindowComponent method definitions

WindowComponent Methods

WindowComponent Methods

The WindowComponent interface defines the following methods.

Kill(shutdown the parent object)

Kill

The **Kill** method releases any memory allocated during the life of the object and performs any other required termination code.

BrowseClass Implementation:

The Kill method calls the BrowseClass.Kill method to terminate the BrowseClass object.

FileDropClass Implementation:

The Kill method calls the FileDropClass.Kill method to terminate the FileDropClass object.

See Also: BrowseClass.Kill, FileDropClass.Kill

PrimaryBufferRestored(confirm restore of primary buffer)

PrimaryBufferRestored()

The **PrimaryBufferRestored** method notifies the Window component that the buffer has been restored successfully. This allows synchronization of the restored buffer with other Window Manager threads.

Implementation:
The **PrimaryBufferRestored** method is called after the SELF.Primary.Me.RestoreBuffer() method to notify the Window Component that the restore is completed.

See Also: PrimaryBufferSaved
PrimaryBufferRestoreRequired

PrimaryBufferRestoreRequired(flag restore of primary buffer)

PrimaryBufferRestoreRequired(),BYTE

The **PrimaryBufferRestoreRequired** method returns TRUE (1) if the buffer pointer of the Window Component has been changed. This allows synchronization of the saved buffer with other Window Manager threads.

Implementation:
The **PrimaryBufferRestoreRequired** method calls the SELF.Primary.Me.RestoreBuffer method to restore the primary buffer in the WindowManager's ResetBuffers method.

See Also: PrimaryBufferSaveRequired

PrimaryBufferRestored

PrimaryBufferSaved(confirm save of primary buffer)

PrimaryBufferSaved

The **PrimaryBufferSaved** method notifies the Window component that the buffer has been saved successfully. This allows synchronization of the saved buffer with other Window Manager threads.

Implementation:
The **PrimaryBufferSaved** method is called after the SELF.Primary.Me.SaveBuffer() method to notify the Window Component that the save is completed.

See Also: PrimaryBufferRestored
PrimaryBufferSaveRequired

PrimaryBufferSaveRequired(flag save of primary buffer)

PrimaryBufferSaveRequired(),BYTE

The **PrimaryBufferSaveRequired** method returns TRUE (1) if the buffer pointer of the Window Component has been deleted. This allows synchronization of the saved buffer with other Window Manager threads.

Implementation:
The **PrimaryBufferSaveRequired** method calls the SELF.Primary.Me.SaveBuffer() method to save the primary buffer in the WindowManager's ResetBuffers method.

See Also: PrimaryBufferSaved
PrimaryBufferRestoreRequired

Reset(reset object's data)

Reset(*forcereset***)**

Reset	Resets the object's data.
forcereset	A numeric constant, variable, EQUATE, or expression that indicates whether to reset the object's data. A value of one (1 or True) unconditionally resets the object's data; a value of zero (0 or False) only resets the objects data as circumstances require

The **Reset** method resets the object's data if needed or if forcereset is TRUE.

BrowseClass Implementation:

The Reset method calls the BrowseClass.ResetSort method to reapply the active sort order to the BrowseClass object. For more information see the BrowseClass.ResetSort section.

FileDropClass Implementation:

The Reset method calls the FileDropClass.ResetQueue method to fill or refill the File Drop control template's display queue.

See Also: BrowseClass.ResetSort, FileDropClass.ResetQueue

ResetRequired(determine if screen refresh needed)

ResetRequired

The **ResetRequired** method determines whether the objects data needs to be refreshed. A TRUE return value indicates a refresh occurred and a screen redraw is necessary.

BrowseClass Implementation:

The ResetRequired method calls the BrowseClass.ApplyRange method to apply the reset fields and range limits and refresh the Browse Box control list if necessary. A TRUE return value indicates a screen redraw is needed.

FileDropClass Implementation:

The ResetRequired method calls the FileDropClass's ApplyRange method inherited from the ViewManager. This method applies the range limits and filters. A TRUE return value indicates a screen redraw is needed.

Return Data Type: BYTE

See Also: BrowseClass.ApplyRange, ViewManager.FileDropClass.ApplyRange

SetAlerts(alert keystrokes for window component)

SetAlerts

The **SetAlerts** method alerts standard keystrokes for the control associated with the window componet's object.

BrowseClass Implementation:
The SetAlerts method alerts standard keystrokes for the Browse Box control and for any associated locator controls.

FileDropClass Implementation:
The SetAlerts method is not implemented for the FileDropClass window component.

TakeEvent(process the current ACCEPT loop event)

TakeEvent

The **TakeEvent** method processes the current ACCEPT loop event.

BrowseClass Implementation:
The TakeEvent method calls the BrowseClass.TakeEvent method to process the current ACCEPT loop event for the BrowseClass object. The method returns a Level:Benign value. For more information see the BrowseClass.TakeEvent section.

FileDropClass Implementation:
The TakeEvent method processes the current ACCEPT loop event for the FileDropClass object. The method returns a Level:Benign value. For more information see the FileDropClass.TakeEvent section.

Return Data Type: BYTE

See Also: BrowseClass.TakeEvent, FileDropClass.TakeEvent

Update(get VIEW data for the selected item)

Update

The **Update** method regets the selected item from the VIEW in order to update the record on disk.

BrowseClass Implementation:

The Update method calls the BrowseClass.UpdateViewRecord method to reread the selected record from the VIEW. For more information see the BrowseClass.UpdateViewRecord.

FileDropClass Implementation:

The Update method is not implemented for the FileDropClass window component.

See Also: BrowseClass.UpdateViewRecord

UpdateWindow(update window controls)

UpdateWindow

The **UpdateWindow** method updates the controls on the window based upon certain conditions set by the WindowComponent object.

BrowseClass Implementation:

The UpdateWindow method calls the BrowseClass.UpdateWindow method to refresh the window controls based upon determined conditions from the BrowseBox. For more information see the BrowseClass.UpdateViewRecord.

FileDropClass Implementation:

The UpdateWindow method is not implemented for the FileDropClass window component.

See Also: BrowseClass.UpdateWindow

WindowResizeClass

WindowResizeClass Overview

The WindowResizeClass lets the end user resize windows that have traditionally been fixed in size due to the controls they contain (List boxes, entry controls, buttons, nested controls, etc.). The WindowResizeClass *intelligently* repositions the controls, resizes the controls, or both, when the end user resizes the window.

WindowResizeClass Concepts

The intelligent repositioning is accomplished by recognizing there are many different types of controls that each have unique repositioning *and* resizing requirements. The WindowResizeClass also recognizes that controls are often nested, and considers whether a given control's coordinates are more closely related to the window's coordinates or to another control's coordinates. That is, intelligent repositioning correctly identifies each control's parent. See SetParentControl for more information on the parent concept.

The intelligent repositioning includes several overall strategies that apply to all window controls, as well as custom per-control strategies for resizing and repositioning individual controls. The overall strategies include:

Surface	Makes the most of the available pixels by positioning other controls to maximize the size of LIST, SHEET, PANEL, and IMAGE controls. We recommend this strategy for template generated windows.
Spread	Maintains the design-time look and feel of the window by applying a strategy specific to each control type. For example, BUTTON sizes are not changed but their positions are tied to the nearest window edge. In contrast, LIST sizes *and* positions are scaled in proportion to the window.
Resize	Rescales all controls in proportion to the window.

See SetStrategy for more information on resizing strategies for individual controls.

Note: To allow window resizing you must set the WINDOW's frame type to Resizable. We also recommend adding the MAX attribute. See The Window Formatter--The Window Properties Dialog in the *User's Guide* for more information on these settings.

WindowResizeClass Relationship to Other Application Builder Classes

The WindowResizeClass is independent of the other Application Builder Classes. It does not rely on other ABC classes, nor do other ABC classes rely on it.

WindowResizeClass ABC Template Implementation

The ABC Templates instantiate a WindowResizeClass object for each WindowResize template in the application, typically one for each procedure that manages a window. The templates may also derive a class from the WindowResizeClass. The derived class (and its object) is called Resizer. The ABC Templates provide the derived class so you can use the WindowResize template **Classes** tab to easily modify the Resizer's behavior on an instance-by-instance basis.

The object instantiated from the derived class is called Resizer. This object supports all the functionality specified in the WindowResize template. See Other Templates--Window Resize for more information on the template implementation of this class.

WindowResizeClass Source Files

The WindowResizeClass source code is installed by default to the Clarion \LIBSRC folder. The WindowResizeClass source code and its respective components are contained in:

ABRESIZE.INC	WindowResizeClass declarations
ABRESIZE.CLW	WindowResizeClass method definitions

WindowResizeClass Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a WindowResizeClass object. This example illustrates the Surface strategy plus some custom strategies for specific controls. The program does nothing except present a window with a typical variety of controls.

```
 PROGRAM
 INCLUDE('ABRESIZE.INC')                !declare WindowResizeClass
 MAP
 END
Resizer  WindowResizeClass              !declare Resizer object

ClientQ  QUEUE,PRE(CLI)                 !declare LIST QUEUE
Name      STRING(20)
State     STRING(2)
         END
!WINDOW needs IMM & RESIZE
window  WINDOW('Client Information'),AT(,,185,100),IMM,GRAY,MAX,RESIZE
      SHEET,AT(3,3,180,78),USE(?Sheet1)
       TAB('Client List'),USE(?ListTab)
        LIST,AT(10,20,165,55),USE(?List1),FROM(ClientQ),|
        FORMAT('87L~Name~@s20@8L~State Code~@s2@')
       END
       TAB('Client Logo'),USE(?LogoTab)
        IMAGE('SV.gif'),AT(50,35),USE(?CLI:Logo)
       END
      END
      PROMPT('Locate:'),AT(7,87),USE(?LocatorPrompt)
      ENTRY(@s20),AT(33,86,61,12),USE(CLI:Name)
      BUTTON('Restore'),AT(110,84),USE(?Restore)
      BUTTON('Close'),AT(150,84),USE(?Close)
     END
 CODE
 OPEN(window)
 window{PROP:MinWidth}=window{PROP:Width}      !set window's minimum width
 window{PROP:MinHeight}=window{PROP:Height}    !set window's minimum height
 Resizer.Init(AppStrategy:Surface)             !initialize Resizer object
 Resizer.SetStrategy(?LocatorPrompt, |         !set control specific strategy:
  Resize:FixLeft+Resize:FixBottom,Resize:LockSize) ! at bottom left & fixed size
 Resizer.SetStrategy(?CLI:Name,   |            !set control specific strategy:
  Resize:FixLeft+Resize:FixBottom,Resize:LockHeight)! at bottom left & fixed height
 ACCEPT
  CASE EVENT()
  OF EVENT:CloseWindow                         !on close window,
   Resizer.Kill                                ! shut down Resizer object
  OF EVENT:Sized                               !on sized window,
```

```
   Resizer.Resize                          ! resize & reposition controls
  END                                      ! applying above strategies
  CASE ACCEPTED()
  OF ?Restore
   Resizer.RestoreWindow                   !restore window to initial size
  OF ?Close
   POST(Event:CloseWindow)
  END
 END
```

WindowResizeClass Properties

The WindowResizeClass contains the following properties.

AutoTransparent (optimize redraw)

AutoTransparent BYTE

The **AutoTransparent** property indicates whether controls that support it are made transparent (TRN attribute) during the resize process. Transparent controls result in less flicker and shadow and smoother resizing, and avoids a Windows bug on some windows.

A value of one (1) makes controls transparent; a value of zero (0) does not.

DeferMoves (optimize resize)

DeferMoves BYTE

The **DeferMoves** property indicates whether to defer control movement until the end of the ACCEPT loop (see *PROP:DeferMove* in the *Language Reference*). This lets the runtime library perform all control movement at once, resulting in a cleaner, "snappier" resize, and avoids a Windows bug on some windows.

A value of one (1) defers control movement; a value of zero (0) does not.

WindowResizeClass Methods

The WindowResizeClass contains the methods listed below.

WindowResizeClass Functional Organization--Expected Use

As an aid to understanding the WindowResizeClass, it is useful to organize the various WindowResizeClass methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the WindowResizeClass methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Init	initialize the WindowResizeClass object
Kill	shut down the WindowResizeClass object

Mainstream Use:

Resize[v]	resize and reposition all controls

Occasional Use:

SetParentControl	set control's parent
SetStrategy	set control's resize strategy

[v] These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

SetParentDefaults	set all controls' parents
RestoreWindow	restore window to initial size
GetParentControl	return control's parent
Resize	resize and reposition all controls

GetParentControl (return parent control)

GetParentControl(*control* **), VIRTUAL**

GetParentControl Returns the parent for a window *control*.

control An integer constant, variable, EQUATE, or expression containing a control number. The Resize method rescales the *control* based on the coordinates of the parent.

The **GetParentControl** method returns the parent for a window *control*. A return value of zero indicates the WINDOW is the parent. Otherwise, the return value is the field equate of another window control.

The SetParentDefaults method intelligently sets the appropriate parent for all the window controls, and the SetParentControl method sets the parent for a single control. The Resize method rescales the *control* based on the coordinates of the parent.

Return Data Type: SIGNED

Example:

```
window WINDOW('Nested Controls'),AT(,,165,97),IMM,GRAY,MAX,RESIZE
     GROUP('OuterGroup'),AT(5,3,154,92),USE(?OuterGroup),BOXED
      BUTTON('Button 1'),AT(14,23),USE(?Button1)
      ENTRY(@s20),AT(60,24),USE(Entry1)
      GROUP('InnerGroup'),AT(11,49,141,38),USE(?InnerGroup),BOXED
       CHECK('Check 1'),AT(32,64),USE(Check1)
       CHECK('Check 2'),AT(91,64),USE(Check2)
    . . .
 CODE
 OPEN(window)
 Resizer.Init(AppStrategy:Spread)               !initialize Resizer object
 Resizer.SetParentDefaults                      !set parents for all controls
 Resizer.SetParentControl(?Button1,?OuterGroup) !override parent for a control
 Resizer.SetParentControl(?Check1,?InnerGroup)  !override parent for a control
 Resizer.SetParentControl(?Check2,?InnerGroup)  !override parent for a control
```

See Also: Resize, SetParentControl, SetParentDefaults

GetPositionStrategy (return position strategy for a control type)

GetPositionStrategy(*control type* [, *strategy*] **)**

GetPositionStrategy

Returns the repositioning strategy for a *control type*.

control type An integer constant, variable, EQUATE, or expression indicating the type of control (BUTTON, ENTRY, LIST, etc.).

strategy An integer constant, variable, EQUATE, or expression indicating the overall strategy for resizing and repositioning all the controls on the window. If omitted, *strategy* defaults to the strategy specified by the Init method.

The **GetPositionStrategy** method returns the appropriate repositioning strategy for a particular *control type* based on the overall *strategy*.

Implementation: The Reset method calls the GetPositionStrategy method to set the position strategy for dynamically created controls.

EQUATEs for the *control type* parameter are declared in EQUATES.CLW. Each control type EQUATE is prefixed with CREATE:.

EQUATEs for the return value are declared in ABRESIZE.INC. Each strategy EQUATE is prefixed with Resize:.

Example:

```
GET(SELF.ControlQueue,SELF.ControlQueue.ID)     !get control resize info
IF ERRORCODE()                                  !if no control info, add it
 SELF.ControlQueue.Type=FieldCounter{PROP:Type} ! set control type
 SELF.ControlQueue.ParentID=0                   ! set parent
 SELF.ControlQueue.HasChildren=False            ! set children
 SELF.ControlQueue.ID=FieldCounter              ! set ID
 GetSizeInfo(FieldCounter,SELF.ControlQueue.Pos)! set coordinates
                                                ! set resize strategies
 SELF.ControlQueue.PositionalStrategy=SELF.GetPositionStrategy(SELF.ControlQueue.Type)
 SELF.ControlQueue.ResizeStrategy=SELF.GetResizeStrategy(SELF.ControlQueue.Type)
 ADD(SELF.ControlQueue,SELF.ControlQueue.ID)    ! add control info
 ASSERT(~ERRORCODE())
END
```

See Also: Init, Reset

GetResizeStrategy (return resize strategy for a control type)

GetResizeStrategy(*control type* [, *strategy*] **)**

GetResizeStrategy

Returns the resizing strategy for a *control type*.

control type An integer constant, variable, EQUATE, or expression indicating the type of control (BUTTON, ENTRY, LIST, etc.).

strategy An integer constant, variable, EQUATE, or expression indicating the overall strategy for resizing and repositioning all the controls on the window. If omitted, *strategy* defaults to the strategy specified by the Init method.

The **GetResizeStrategy** method returns the appropriate resizing strategy for a particular *control type* based on the overall *strategy*.

Implementation: The Reset method calls the GetResizeStrategy method to set the resizing strategy for dynamically created controls.

EQUATEs for the *control type* parameter are declared in EQUATES.CLW. Each control type EQUATE is prefixed with CREATE:.

EQUATEs for the return value are declared in ABRESIZE.INC. Each strategy EQUATE is prefixed with Resize:.

Return Data Type: USHORT

Example:

```
GET(SELF.ControlQueue,SELF.ControlQueue.ID)    !get control resize info
IF ERRORCODE()                                 !if no control info, add it
 SELF.ControlQueue.Type=FieldCounter{PROP:Type}! set control type
 SELF.ControlQueue.ParentID=0                  ! set parent
 SELF.ControlQueue.HasChildren=False           ! set children
 SELF.ControlQueue.ID=FieldCounter             ! set ID
 GetSizeInfo(FieldCounter,SELF.ControlQueue.Pos)! set coordinates
 ! set resize strategies
 SELF.ControlQueue.PositionalStrategy=SELF.GetPositionStrategy(SELF.ControlQueue.Type)
 SELF.ControlQueue.ResizeStrategy=SELF.GetResizeStrategy(SELF.ControlQueue.Type)
 ADD(SELF.ControlQueue,SELF.ControlQueue.ID)   ! add control info
 ASSERT(~ERRORCODE())
END
```

See Also: Init, Reset

Init (initialize the WindowResizeClass object)

Init([*strategy*] [,*minimum size*] [,*maximum size*] **)**

Init	Initializes the WindowResizeClass object.
strategy	An integer constant, variable, EQUATE, or expression indicating the overall strategy for resizing and repositioning all the controls on the window. If omitted, *strategy* defaults to **`AppStrategy:Resize`**, which rescales all controls in proportion to the parent.
minimum size	An integer constant, variable, EQUATE, or expression indicating the minimum size of the window. A value of one (1) sets the minimum window size to its design size. If omitted, *minimum size* defaults to zero (0), which indicates no minimum.
maximum size	An integer constant, variable, EQUATE, or expression indicating the minimum size of the window. A value of one (1) sets the maximum window size to its design size. If omitted, *maximum size* defaults to zero (0), which indicates no maximum.

The **Init** method initializes the WindowResizeClass object and sets the overall strategy for resizing and repositioning window controls. You can use the SetStrategy method to override the overall strategy for individual controls.

Implementation: The Init method adds the IMM attribute to the WINDOW.

If the *strategy* parameter is present, Init applies a strategy to each control based on the parameter value. If the *strategy* parameter is absent, Init applies the default strategy to each control. The default *strategy* is to rescale all control coordinates (x, y, width, and height) proportionally with the parent.

The parent may be the WINDOW containing the control, or it may be another control on the WINDOW. The SetParentControl and SetParentDefaults methods determine the parent for a given control.

The *strategy* parameter EQUATEs are declared in RESIZE.INC as follows:

```
   ITEMIZE(0),PRE(AppStrategy)
Resize  EQUATE  !Rescale all controls proportionally
Spread  EQUATE  !Preserve design time look & feel
Surface EQUATE  !Maximize available pixels
   END
```

The purpose and effect of these strategies are:

Resize	Scales all window coordinates by the same amount as the parent, thus preserving the relative sizes and positions of all controls. This is the default strategy.
Surface	Makes the most of the available pixels by positioning other controls to maximize the size of LIST, SHEET, PANEL, and IMAGE controls.
Spread	Preserves the design-time look and feel of the window by applying the following strategies by control type:
BUTTON	Horizontal and Vertical position (X and Y coordinates) are "fixed" relative to the nearest parent border; width and height are unchanged.
RADIO	Horizontal and vertical position are scaled with the parent, but width and height are unchanged.
CHECK	Horizontal and vertical position are scaled with the parent, but width and height are unchanged.
ENTRY	Width, horizontal and vertical position are scaled with the parent, but height is unchanged.
COMBO+DROP	Width, horizontal and vertical position are scaled with the parent, but height is unchanged.
LIST+DROP	Width, horizontal and vertical position are scaled with the parent, but height is unchanged.
SPIN	Width, horizontal and vertical position are scaled with the parent, but height is unchanged.
Other	All coordinates are scaled with the parent.

Tip: Even though LIST and COMBO controls may be resized, the column widths within them are not resized. However, the right-most column does expand or contract depending on the available space.

Example:

```
OPEN(window)
Resizer.Init(AppStrategy:Surface)!initialize Resizer object
ACCEPT
 CASE EVENT()
 OF EVENT:CloseWindow            !on close window,
  Resizer.Kill                   ! shut down Resizer object
 OF EVENT:Sized                  !on sized window,
  Resizer.Resize                 ! resize & reposition controls
 END
END
```

See Also: SetParentControl, SetParentDefaults, SetStrategy

Kill (shut down the WindowResizeClass object)

Kill

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code.

Example:

```
OPEN(window)
Resizer.Init(AppStrategy:Surface)      !initialize Resizer object
ACCEPT
 CASE EVENT()
 OF EVENT:CloseWindow                  !on close window,
  Resizer.Kill                         ! shut down Resizer object
 OF EVENT:Sized                        !on sized window,
  Resizer.Resize                       ! resize & reposition controls
 END
END
```

Reset (resets the WindowResizeClass object)

Reset, VIRTUAL

The **Reset** method resets the WindowResizeClass object to conform to the window in its present state.

Implementation: The Init method calls the Reset method. The Reset method stores the initial coordinates for the window and its controls. The WindowResizeClass object uses the stored coordinates to restore the window, establish parent-child relationships between controls, etc.

Example:

```
ThisWindow.Init PROCEDURE()
ReturnValue          BYTE,AUTO
  CODE
 !procedure code
  Resizer.Init(AppStrategy:Surface,Resize:SetMinSize)
  SELF.AddItem(Resizer)
  Resizer.AutoTransparent=True
  Resizer.SetParentDefaults
  INIMgr.Fetch('BrowseMembers',QuickWindow)
  Resizer.Resize               !Resize needed if window altered by INIMgr
  Resizer.Reset               !Reset needed if window altered by INIMgr
  SELF.SetAlerts()
  RETURN ReturnValue
```

See Also: Init

Resize (resize and reposition controls)

Resize, VIRTUAL, PROC

The **Resize** method resizes and respositions each window control by applying the specified strategy to each control, and returns a value indicating whether ACCEPT loop processing is complete and should stop.

Resize returns Level:Benign to indicate processing of the event (typically EVENT:Sized) should continue normally; it returns Level:Notify to indicate processing is completed for the event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

The Init method and the SetStrategy method determine the strategies to apply to each control. All resizing strategies consider the new coordinates of the each control's "parent." By default, the WINDOW is the parent of each control. However, you may designate any control as the parent of any other control with the SetParentControl method.

Return Data Type: BYTE

Example:

```
 OPEN(window)
 Resizer.Init(AppStrategy:Surface)           !init Resizer-general strategy
 Resizer.SetStrategy(?CloseButton, |         !set control specific strategy:
  Resize:FixRight+Resize:FixBottom,Resize:LockSize) ! at bottom right & fixed
size
 ACCEPT
  CASE EVENT()
  OF EVENT:CloseWindow                !on close window,
   Resizer.Kill                       ! shut down Resizer object
  OF EVENT:Sized                      !on sized window,
   Resizer.Resize                     ! resize & reposition controls
  END
 END
```

See Also: Init, SetStrategy, SetParentControl

RestoreWindow (restore window to initial size)

RestoreWindow, VIRTUAL

The **RestoreWindow** method restores the window and all its controls to their sizes in effect when the Init method executed.

Example:

```
OPEN(window)
Resizer.Init(AppStrategy:Surface)        !init Resizer overall strategy
ACCEPT
 CASE EVENT()
 OF EVENT:CloseWindow
  Resizer.Kill                           ! shut down Resizer object
 OF EVENT:Sized
  Resizer.Resize                         ! resize & reposition controls
 END
 CASE ACCEPTED()
 OF ?RestoreButton
  Resizer.RestoreWindow                  !restore window to original spec
 END
END
```

See Also: Init

SetParentControl (set parent control)

SetParentControl(*control* [,*parent*] **)**

SetParentControl Sets the *parent* for a window *control*.

control An integer constant, variable, EQUATE, or expression containing a control number. The Resize method rescales the *control* based on the coordinates of the *parent*.

parent An integer constant, variable, EQUATE, or expression containing a control number. The Resize method rescales the *control* based on the coordinates of the *parent*. If omitted, *parent* defaults to the WINDOW.

The **SetParentControl** method sets the *parent* for a window *control*. The Resize method rescales the *control* based on the coordinates of the *parent*.

This lets you rescale a particular control based upon a related control's coordinates rather than on the window's coordinates. This is appropriate when the strategy applied to the parent control causes it to be scaled disproportionately from the window. For example, controls within a GROUP structure whose size is "locked" may be rescaled to fit the GROUP's coordinates rather than the window's coordinates.

The SetParentDefaults method intelligently sets the appropriate parent for each window control so you only need to use SetParentControl if SetParentDefaults sets an inappropriate parent. The GetParentControl method returns the parent control number for a control.

Example:

```
window WINDOW('Nested Controls'),AT(,,165,97),IMM,GRAY,MAX,RESIZE
     GROUP('OuterGroup'),AT(5,3,154,92),USE(?OuterGroup),BOXED
      BUTTON('Button 1'),AT(14,23),USE(?Button1)
      ENTRY(@s20),AT(60,24),USE(Entry1)
      GROUP('InnerGroup'),AT(11,49,141,38),USE(?InnerGroup),BOXED
       CHECK('Check 1'),AT(32,64),USE(Check1)
       CHECK('Check 2'),AT(91,64),USE(Check2)
      END
     END
END
 CODE
 OPEN(window)
 Resizer.Init(AppStrategy:Spread)               !initialize Resizer object
 Resizer.SetParentDefaults                      !set parents for all controls
 Resizer.SetParentControl(?Button1,?OuterGroup) !override parent for a control
 Resizer.SetParentControl(?Check1,?InnerGroup)  !override parent for a control
 Resizer.SetParentControl(?Check2,?InnerGroup)  !override parent for a control
```

See Also: GetParentControl, Resize, SetParentDefaults

SetParentDefaults (set default parent controls)

SetParentDefaults, VIRTUAL

The **SetParentDefaults** method intelligently sets the appropriate parent for each window control. The Resize method rescales each control based on the coordinates of its parent.

This lets you rescale a particular control based upon a related control's coordinates rather than on the window's coordinates. This is appropriate when the strategy applied to the parent control causes it to be scaled disproportionately from the window. For example, controls within a GROUP structure whose size is "locked" may be rescaled to fit the GROUP's coordinates rather than the window's coordinates.

You may use the SetParentControl method to set the parent for a single control.

Implementation: The SetParentDefaults method considers each control's coordinates. If the control's coordinates fall within the coordinates of another control, the SetParentDefaults method sets the "outer" control as the parent of the "inner" control.

The Init method calls the SetParentDefaults method when the resize strategy is AppStrategy:Surface.

Example:

```
window WINDOW('Nested Controls'),AT(,,165,97),IMM,GRAY,MAX,RESIZE
     GROUP('OuterGroup'),AT(5,3,154,92),USE(?OuterGroup),BOXED
      BUTTON('Button 1'),AT(14,23),USE(?Button1)
      ENTRY(@s20),AT(60,24),USE(Entry1)
      GROUP('InnerGroup'),AT(11,49,141,38),USE(?InnerGroup),BOXED
       CHECK('Check 1'),AT(32,64),USE(Check1)
       CHECK('Check 2'),AT(91,64),USE(Check2)
      END
     END
END
 CODE
 OPEN(window)
 Resizer.Init(AppStrategy:Spread)               !initialize Resizer object
 Resizer.SetParentDefaults                      !set parents for all controls
 Resizer.SetParentControl(?Button1,?OuterGroup) !override parent for a control
 Resizer.SetParentControl(?Check1,?InnerGroup)  !override parent for a control
 Resizer.SetParentControl(?Check2,?InnerGroup)  !override parent for a control
```

See Also: Resize, SetParentControl

SetStrategy (set control resize strategy)

SetStrategy(|[*control*] ,*position strategy*, *size strategy*| **)**

| *source control*, *target control* |

SetStrategy	Sets the *position strategy* and the *size strategy* to apply to a control.
control	An integer constant, variable, EQUATE, or expression containing a control number. If omitted, the SetStrategy method applies *position strategy* and *size strategy* to all controls on the WINDOW.
position strategy	An integer constant, variable, EQUATE, or expression indicating the position strategy to apply to the *control*.
size strategy	An integer constant, variable, EQUATE, or expression indicating the size strategy to apply to the *control*.
source control	An integer constant, variable, EQUATE, or expression identifying the control whose *position strategy* and *size strategy* are applied to the *target control*.
target control	An integer constant, variable, EQUATE, or expression identifying the control whose *position strategy* and *size strategy* are copied from the *source control*.

The **SetStrategy** method sets the *position strategy* and the *size strategy* to apply to a window *control* or controls. The Resize method applies the specified strategies.

Implementation: EQUATEs for the *position strategy* and the *size strategy* parameters are declared in ABRESIZE.INC as follows. To apply two or more strategies, simply add them together.

```
!Resize strategies
Resize:Resize         EQUATE(0000b) !rescale height & width
Resize:LockWidth      EQUATE(0001b) !locks width
Resize:LockHeight     EQUATE(0010b) !locks height
Resize:LockSize       EQUATE(0011b) !locks height & width
Resize:ConstantRight  EQUATE(0100b) !locks right edge, moves left
Resize:ConstantBottom EQUATE(1000b) !locks bottom edge, moves top

!Reposition Strategies - Horizontal position
Resize:Reposition     EQUATE(0000h) !rescale X & Y
Resize:LockXPos       EQUATE(0001h) !locks left edge (absolute)
Resize:FixRight       EQUATE(0002h) !fixes right edge (relative)
Resize:FixLeft        EQUATE(0003h) !fixes left edge (relative)
Resize:FixXCenter     EQUATE(0004h) !fixes horizontal center (relative)
Resize:FixNearestX    EQUATE(0005h) !FixRight or FixLeft
```

```
!Reposition Strategies - Vertical position
Resize:LockYPos       EQUATE(0100h) !locks top edge (absolute)
Resize:FixBottom      EQUATE(0200h) !fixes bottom edge (relative)
Resize:FixTop         EQUATE(0300h) !fixes top edge (relative)
Resize:FixYCenter     EQUATE(0400h) !fixes vertical center (relative)
Resize:FixNearestY    EQUATE(0500h) !FixTop or FixBottom
```

Example:

```
window  WINDOW('Client Information'),AT(,,185,100),IMM,GRAY,MAX,RESIZE
         SHEET,AT(3,3,180,78),USE(?Sheet1)
          TAB('Client List'),USE(?ListTab)
           LIST,AT(10,20,165,55),USE(?List1),FROM(ClientQ),|
           FORMAT('87L~Name~@s20@8L~State Code~@s2@')
          END
          TAB('Client Logo'),USE(?LogoTab)
           IMAGE,AT(10,20,165,55),USE(?CLI:Logo)
          END
         END
         PROMPT('Locate:'),AT(7,87),USE(?LocatorPrompt)
         ENTRY(@s20),AT(33,86,61,12),USE(CLI:Name)
         BUTTON('Close'),AT(150,84),USE(?Close)
        END
 CODE
 OPEN(window)
 Resizer.Init(AppStrategy:Surface)                 !init Resizer overall strategy
 Resizer.SetStrategy(?LocatorPrompt, |             !set control specific strategy:
 Resize:FixLeft+Resize:FixBottom,Resize:LockSize)  ! at bottom left & fixed size
 Resizer.SetStrategy(?CLI:Name,   |                !set control specific strategy:
 Resize:FixLeft+Resize:FixBottom,Resize:LockHeight)! at bottom left & fixed height
```

See Also: Resize

WindowManager

WindowManager Overview

The WindowManager class declares a Window Manager that provides highly structured, consistent, flexible, and convenient processing for Clarion window procedures. The WindowManager class is actually a window *procedure* manager. This includes almost every template generated procedure, including Process and Report procedures.

WindowManager Concepts

A Structured Window Procedure Manager

The WindowManager object initializes the procedure, runs the procedure by handling all ACCEPT loop events for the WINDOW, then shuts down the procedure. The WindowManager handles events primarily by forwarding the events to other ABC Library objects for processing.

The WindowManager is a fairly generic base class and therefore handles events and processes that are common across most Windows applications. For an example of a process-specific WindowManager implementation, see Print Preview Class and Report Manager Class.

Implements Update Procedure Policy

In addition to its function as a general purpose window procedure manager, the WindowManager may be configured to implement a variety of options for update procedures--window procedures that support record inserts, changes, and deletes. The WindowManager carries out the specified options for these update procedures (forms).

Integrated with other ABC Library Objects

The WindowManager is closely integrated with several other ABC Library objects; in particular, the BrowseClass, ToolbarClass, FileDropClass, and FileDropComboClass objects. These objects register their presence with each other, set each other's properties, and call each other's methods to accomplish their goals.

These integrated objects could override the WindowManager's methods (such as TakeAccepted) to perform their jobs; however, because the WindowManager is programmed to understand these ABC objects, once they are registered (AddItem), the WindowManager drives them directly according to their documented interfaces.

Encapsulated Event Processing

The WindowManager provides separate virtual methods to group the handling of all ACCEPT loop events into logical, convenient containers (virtual methods), so that, should you need to implement custom (non-default) event handling, you can implement your changes within the relatively small scope of the specific virtual method that implements the default event handling you wish to change. This logical grouping of window event handling is as follows:

TakeEvent	(handle **all** events)
TakeWindowEvent	(handle **all** non-field events--do default processing for common non-field e
TakeAccepted	(do default EVENT:Accepted processing)
TakeRejected	(do default EVENT:Rejected processing)
TakeSelected	(do default EVENT:Selected processing)
TakeNewSelection	(do default EVENT:NewSelection processing)
TakeCompleted	(do default EVENT:Completed processing)
TakeCloseEvent	(do default EVENT:Close processing)
TakeFieldEvent	(handle **all** field events--do custom processing for field events)

WindowManager ABC Template Implementation

The ABC Templates *derive* a class from the WindowManager class for *each* procedure that drives an interactive window, including Report and Process procedures. The derived class is called ThisWindow, and its methods and behavior can be modified on the Window Behavior Classes tab.

The ABC Templates generate virtual methods as needed to provide procedure specific initialization, event handling, and shut down.

WindowManager Relationship to Other Application Builder Classes

The WindowManager is closely integrated with several other ABC Library objects--in particular, the BrowseClass, FileDropClass, FileDropComboClass, and ToolbarClass objects. These objects register their presence with the WindowManager, set each other's properties, and call each other's methods as needed to accomplish their respective goals.

The BrowseClass uses the WindowManager to refresh the window as needed. Therefore, if your program instantiates the BrowseClass, it must also instantiate the WindowManager. Much of this is automatic when you INCLUDE the BrowseClass header (ABBROWSE.INC) in your program's data section. See the Conceptual Example and see Browse Class for more information.

The WindowManager serves as the foundation of the PrintPreviewClass and the ReportManager. That is, both the PrintPreviewClass and the ReportManager are derived from the WindowManager, because both derived classes manage a window procedure.

PrintPreviewClass--Print Preview Window Manager

The PrintPreviewClass implements a full featured print preview window. See Print Preview Class for more information.

ReportManager--Progress Window Manager

The ReportManager implements a progress window that monitors and displays the status of a report. See Report Manager Class for more information.

WindowManager Source Files

The WindowManager source code is installed by default to the Clarion \LIBSRC folder. The WindowManager source code and its respective components are contained in:

ABWINDOW.INC	WindowManager declarations
ABWINDOW.CLW	WindowManager method definitions

WindowManager Conceptual Example

The following example shows a typical sequence of statements to declare, instantiate, initialize, use, and terminate a WindowManager and related objects. This example performs repetitive inserts to a Customer file and also adds phone numbers for each customer to a related Phones file. It uses the WindowManager to call a procedure to validate the customer's state code against a States file.

Note that the WindowManager is aware of other ABC objects, such as BrowseClass objects, Toolbar objects, FileDrop objects, etc. This example shows the interaction between the WindowManager object and a FileManager object and a BrowseClass object.

```
AddCustomer   PROGRAM

   INCLUDE('ABWINDOW.INC')          !declare WindowManager
   INCLUDE('ABFILE.INC')            !declare File,View&Relation Mgrs
   INCLUDE('ABBROWSE.INC')          !declare BrowseClass

   MAP
SelectState PROCEDURE               !procedure to validate State
   END

GlobalErrors  ErrorClass            !declare GlobalErrors object
GlobalRequest  BYTE(0),THREAD       !inter procedure communication
GlobalResponse BYTE(0),THREAD       !inter procedure communication
VCRRequest   LONG(0),THREAD         !inter procedure communication

Customer   FILE,DRIVER('TOPSPEED'),PRE(CUS),CREATE,THREAD
BYNUMBER    KEY(CUS:CUSTNO),NOCASE,OPT,PRIMARY
Record      RECORD,PRE()
CUSTNO       LONG
Name         STRING(30)
State        STRING(2)
            END
           END

Phones    FILE,DRIVER('TOPSPEED'),PRE(PH),CREATE,THREAD
IDKEY      KEY(PH:ID),DUP,NOCASE
Record     RECORD,PRE()
ID          LONG
NUMBER      STRING(20)
           END
          END

State       FILE,DRIVER('TOPSPEED'),PRE(ST),CREATE,THREAD
StateCodeKey KEY(ST:STATECODE),NOCASE,OPT
Record       RECORD,PRE()
```

```
STATECODE     STRING(2)
STATENAME     STRING(20)
            END
           END
Access:State   CLASS(FileManager)       !declare Access:State object
Init           PROCEDURE
               END
Relate:State   CLASS(RelationManager)   !declare Relate:State object
Init           PROCEDURE
               END
Access:Customer CLASS(FileManager)      !declare Access:Customer object
Init            PROCEDURE
                END
Relate:Customer CLASS(RelationManager)  !declare Relate:Customer object
Init            PROCEDURE
                END
Access:Phones   CLASS(FileManager)      !declare Access:Phones object
Init            PROCEDURE
                END
Relate:Phones   CLASS(RelationManager)  !declare Relate:Phones object
Init            PROCEDURE
                END

PhoneView VIEW(Phones)                  !declare Phones VIEW
          END

PhoneQ  QUEUE                           !declare PhoneQ for browse list
PH:ID     LIKE(PH:ID)
PH:NUMBER LIKE(PH:NUMBER)
ViewPos   STRING(512)
        END

CUS:Save  LIKE(CUS:RECORD),STATIC       !declare save area for Cus ditto key

CUSWindow WINDOW('Add Customer'),AT(,,146,128),IMM,SYSTEM,GRAY
           SHEET,AT(4,4,136,102),USE(?CurrentTab)
            TAB('General'),USE(?GeneralTab)       !General tab
             PROMPT('ID:'),AT(8,35),USE(?CUSTNO:Prompt)
             ENTRY(@n-14),AT(42,35,41,10),USE(CUS:CUSTNO),RIGHT(1)
             PROMPT('Name:'),AT(8,49),USE(?NAME:Prompt)
             ENTRY(@s30),AT(42,49,90,10),USE(CUS:NAME)! Customer Name
             PROMPT('State:'),AT(8,63),USE(?State:Prompt)
             ENTRY(@s2),AT(42,63,40,10),USE(CUS:State)! Customer State
            END
            TAB('Phones'),USE(?PhoneTab)         !Phones tab
             LIST,AT(8,20,128,63),USE(?PhoneList),IMM,HVSCROLL,FROM(PhoneQ),|
             FORMAT('38R(2)|M~ID~C(0)@n-14@80L(2)|M~NUMBER~@s20@')
             BUTTON('&Insert'),AT(8,87),USE(?Insert)
```

```
            BUTTON('&Change'),AT(53,87),USE(?Change)
            BUTTON('&Delete'),AT(103,87),USE(?Delete)
           END
          END
         BUTTON('OK'),AT(68,110),USE(?OK),DEFAULT
         BUTTON('Cancel'),AT(105,110),USE(?Cancel)
        END

ThisWindow  CLASS(WindowManager)              !declare derived ThisWindow object
Init         PROCEDURE(),BYTE,PROC,VIRTUAL    !procedure specific initialization
Kill         PROCEDURE(),BYTE,PROC,VIRTUAL    !procedure specific shut down
Run          PROCEDURE(USHORT Number,BYTE Request),BYTE,PROC,VIRTUAL !run a procedure
TakeAccepted PROCEDURE(),BYTE,PROC,VIRTUAL    !non-default EVENT:Accepted handling
            END

PhBrowse CLASS(BrowseClass)              !declare PhBrowse object
Q        &PhoneQ                         !which works with ThisWindow object
         END


CODE
  ThisWindow.Run()                 !run the program / procedure
                                   !(Init, Ask, Kill)
ThisWindow.Init  PROCEDURE()       !setup and "program" ThisWindow
ReturnValue     BYTE,AUTO
  CODE
  GlobalErrors.Init                !initialize GlobalErrors object
  Relate:Customer.Init             !initialize Relate:Customer object
  Relate:State.Init                !initialize Relate:State object
  Relate:Phones.Init               !initialize Relate:Phones object
  ReturnValue = PARENT.Init()      !call base class WindowManager.Init
  Relate:Customer.Open             !open Customer & related files
  Relate:State.Open                !open State & related files
                                   !Program ThisWindow object:
  SELF.Request = InsertRecord      ! insert records only
  SELF.FirstField = ?CUSTNO:Prompt! CustNo is firstfield for ThisWindow
  SELF.VCRRequest &= VCRRequest    ! set VCRRequest for ThisWindow
  SELF.Errors &= GlobalErrors      ! set error handler for ThisWindow
  SELF.HistoryKey = 734            ! set ditto key (CTRL')
  SELF.AddHistoryFile(CUS:Record,CUS:Save) ! set ditto file
  SELF.AddHistoryField(?CUS:CUSTNO,1)      ! set ditto (restorable) field
  SELF.AddHistoryField(?CUS:NAME,2)        ! set ditto (restorable) field
 SELF.AddHistoryField(?CUS:State,3)        ! set ditto (restorable) field
  SELF.AddUpdateFile(Access:Customer)      ! register FileManager with ThisWindow
  SELF.Primary &= Relate:Customer          ! register RelationMgr with ThisWindow
  SELF.AddItem(?Cancel,RequestCancelled)   ! set action for Cancel button
  SELF.InsertAction = Insert:Batch         ! set insert action (repetitive)
  SELF.OkControl = ?OK                     ! set OK button
```

```
  IF SELF.PrimeUpdate() THEN RETURN Level:Notify. !prepare record for add
  OPEN(CUSWindow)                          !open the window
  SELF.Opened=True                         ! flag it as open
                                           !Program PhBrowse object, including
                                           ! registering ThisWindow (SELF)
  PhBrowse.Init(?PhoneList,PhoneQ.ViewPos,PhoneView,PhoneQ,Relate:Phones,SELF)
  PhBrowse.Q &= PhoneQ
  PhBrowse.AddSortOrder(,PH:IDKEY)
  PhBrowse.AddRange(PH:ID,Relate:Phones,Relate:Customer)
  PhBrowse.AddField(PH:ID,PhBrowse.Q.PH:ID)
  PhBrowse.AddField(PH:NUMBER,PhBrowse.Q.PH:NUMBER)
  PhBrowse.InsertControl=?Insert
  PhBrowse.ChangeControl=?Change
  PhBrowse.DeleteControl=?Delete
  SELF.SetAlerts()                         !alert keys for ThisWindow
  RETURN ReturnValue

ThisWindow.Kill  PROCEDURE()               !shut down ThisWindow
ReturnValue    BYTE,AUTO
  CODE
  ReturnValue = PARENT.Kill()              !call base class WindowManager.Kill
  Relate:Customer.Close                    !close Customer & related files
  Relate:State.Close                       !close State & related files
  Relate:Customer.Kill                     !shut down Relate:Customer object
  Relate:State.Kill                        !shut down Relate:State object
  Relate:Phones.Kill                       !shut down Relate:Phones object
  GlobalErrors.Kill                        !shut down GlobalErrors object
  RETURN ReturnValue

ThisWindow.Run  PROCEDURE(USHORT Number,BYTE Request)!call other procedures
ReturnValue    BYTE,AUTO
  CODE
  GlobalRequest = Request           !set inter procedure request
  EXECUTE Number                    !run specified procedure
    SelectState
  END
  ReturnValue = GlobalResponse      !set inter procedure response
  RETURN ReturnValue

ThisWindow.TakeAccepted  PROCEDURE()                  !EVENT:Accepted handling
ReturnValue        BYTE,AUTO
Looped BYTE
 CODE
 LOOP
  IF Looped THEN RETURN Level:Notify ELSE Looped = 1. !allow CYCLE to work
  ReturnValue = PARENT.TakeAccepted()                 !do standard EVENT:Accepted
  CASE ACCEPTED()                                     !do special EVENT:Accepted
  OF ?CUS:State                                       ! on State field
```

```
   ST:STATECODE = CUS:State                              ! lookup State code
   IF Access:State.Fetch(ST:StateCodeKey)                ! if not found
    IF SELF.Run(1,SelectRecord) = RequestCompleted       ! let user select one
     CUS:State = ST:STATECODE                            ! set selected state
    ELSE                                                 !if user didn't select one
     SELECT(?CUS:State)                                  !focus on State field
     CYCLE                                               !start over
    END
   END
   ThisWindow.Reset()                                    !reset ThisWindow if needed
  END
  RETURN ReturnValue
END
```

WindowManager Properties

The WindowManager contains the following properties.

AutoRefresh (reset window as needed flag)

AutoRefresh BYTE

The **AutoRefresh** property determines whether the WindowManager automatically resets the window and its associated objects whenever it detects a change. The WindowManager checks for changes after it processes each event. A value of one (1 or True) automatically resets the window; a value of zero (0 or False) does not automatically reset the window.

AutoRefresh is particularly useful when resetting a BrowseClass object changes a field which is a range-limit of another BrowseClass object.

Implementation: The Init method sets the AutoRefresh property to one. The TakeEvent method implements the action specified by AutoRefresh by calling the Reset method only if any registered BrowseClass objects have changed.

The AddItem method registers BrowseClass objects with the WindowManager.

See Also: AddItem, Init, Reset

AutoToolbar (set toolbar target on new tab selection)

AutoToolbar BYTE

The **AutoToolbar** property determines how the WindowManager sets the ToolbarTarget. A value of one (1 or True) uses the ToolbarClass object to set the appropriate ToolbarTarget whenever a new TAB is selected; a value of zero (0 or False) uses the current ToolbarTarget.

Implementation: The Init method sets the AutoToolbar property to True. The TakeNewSelection method implements the action specified by AutoToolbar by calling ToolbarClass.SetTarget if the control selected is a SHEET.

See Also: Init, ToolbarClass.SetTarget, ToolbarTargetClass

CancelAction (response to cancel request)

CancelAction BYTE

The **CancelAction** property indicates the WindowManager action to take when the end user "Cancels" the window with changes pending. Valid actions are:

Cancel:Cancel	immediate abandon (no confirmation)
Cancel:Save	immediate save (no confirmation)
Cancel:Save+Cancel:Query	offer to save or abandon
Cancel:Cancel+Cancel:Query	offer to resume editing or abandon

Implementation: The Init method sets the CancelAction property to Cancel:Save + Cancel:Query. The TakeCloseEvent method carries out the action specified by the CancelAction property.

CancelAction EQUATEs are declared in ABWINDOW.INC as follows:

```
    ITEMIZE,PRE(Cancel)
Cancel  EQUATE(0)
Save    EQUATE(1)
Query   EQUATE(2)
    END
```

See Also: Init, TakeCloseEvent, Request, Response

ChangeAction (response to change request)

ChangeAction BYTE

The **ChangeAction** property whether change is a valid action for an update procedure. A value of one (1 or True) indicates the procedure may change (write) records; a value of zero (0 or False) indicates the procedure may not change records.

Implementation: The Init method sets the ChangeAction property to one (1).

See Also: Init

Dead (shut down flag)

Dead BYTE, PROTECTED

The **Dead** property indicates whether the WindowManager should shut down. The WindowManager uses this property to undertake a normal shut down at the earliest opportunity. A value of one (1 or True) indicates the WindowManager should shut down; a value of zero (0 or False) indicates the WindowManager should continue.

Implementation: The Kill method sets the Dead property to True.

See Also: Kill

DeleteAction (response to delete request)

DeleteAction BYTE

The **DeleteAction** property indicates the WindowManager action to take when the end user requests to delete a record. Valid actions are:

Delete:None	delete not allowed
Delete:Warn	confirm delete with message
Delete:Form	confirm delete with update form
Delete:Auto	immediate delete (no confirmation)

Implementation: The Init method sets the DeleteAction property to Delete:Warn. The PrimeUpdate method carries out the action specified by the DeleteAction property.

DeleteAction EQUATEs are declared in ABWINDOW.INC as follows:

```
   ITEMIZE,PRE(Delete)
None  EQUATE
Warn  EQUATE
Form  EQUATE
Auto  EQUATE
   END
```

See Also: Init, TakeCloseEvent, Request, Response

Errors (ErrorClass object)

Errors &ErrorClass

The **Errors** property is a reference to the ErrorClass object that handles unexpected conditions for the WindowManager. In an ABC Template generated program, the ErrorClass object is called GlobalErrors.

Implementation: The WindowManagerClass does not initialize the Errors property. Your derived Init method should initialize the Errors property. See the Conceptual Example.

FilesOpened(files opened by procedure)

FilesOpened BYTE, PROTECTED

The **FilesOpened** property is a flag used to keep track of files opened by the WindowManager class.

Implementation: The FilesOpened property is set to TRUE in the Init method if there are files to be opened by the procedure. This property is examined in the Kill method to determine whether files need to be closed by the procedure.

FirstField (first window control)

FirstField SIGNED

The **FirstField** property contains the control number (field equate) of the window control that initially receives focus when the window displays.

Implementation: The WindowManagerClass does not initialize the FirstField property. Your derived Init method should initialize the FirstField property. See the Conceptual Example.

ForcedReset (force reset flag)

ForcedReset BYTE

The **ForcedReset** property indicates whether the WindowManager should unconditionally reset itself. A value of zero (0 or False) allows a conditional reset (reset only if circumstances demand, for example, when the end user invokes a new BrowseBox sort order or invokes a BrowseBox locator); a value of one (1 or True) forces an unconditional reset.

Implementation: The Reset method carries out the action specified by the ForcedReset property.

See Also: Reset

HistoryKey (restore field key)

HistoryKey SIGNED

The **HistoryKey** property enables "save/restore field history" and sets the keystroke which restores a form field's prior saved value. When the end user presses the specified key, the WindowManager retores the field with focus from the previously processed record.

Implementation: The WindowManagerClass does not initialize the HistoryKey property. Your derived Init method should initialize the HistoryKey property if your window uses a history key. See the *Conceptual Example*.

The AddHistoryFile method names the file and record buffers from which fields are saved and restored. AddHistoryField associates specific fields from the history file with their corresponding WINDOW controls. The SaveHistory method saves a copy of the history fields. The RestoreField method restores the contents of a specific control.

Keystroke EQUATEs are declared in \LIBSRC\KEYCODES.CLW.

See Also: AddHistoryField, AddHistoryFile, RestoreField, SaveHistory

InsertAction (response to insert request)

InsertAction BYTE

The **InsertAction** property indicates the WindowManager action to take when the end user "Inserts" a record. Valid actions are:

Insert:None	use the default insert action (Insert:Caller)
Insert:Caller	return to calling procedure
Insert:Batch	immediately allow another insert
Insert:Query	offer to return or do another insert

Implementation: The Init method sets the InsertAction property to Insert:Caller. The TakeCompleted method carries out the action specified by the InsertAction property.

The AddUpdateFile method registers files involved in batch adds.

InsertAction EQUATEs are declared in ABWINDOW.INC as follows:

```
      ITEMIZE,PRE(Insert)
None   EQUATE
Caller EQUATE
Batch  EQUATE
Query  EQUATE
      END
```

See Also: AddUpdateFile, TakeCompleted, Init, Request, Response

LastInsertedPosition (hold position of last inserted record)

LastInsertedPosition STRING(1024), PROTECTED

The **LastInsertedPosition** property contains the position of the last record added.

Implementation: The WindowManagerClass clears the LastInsertedPosition property in the Ask method. The property is updated by the File Manager's Position method after a Insert:Batch update.

MyWindow (the Managed WINDOW)

MyWindow &WINDOW

The **MyWindow** property is a reference to the managed primary WINDOW structure. The WindowManager uses this property to open the WINDOW.

Implementation: The Open method sets the MyWindow property.

OKControl (window acceptance control--OK button)

OKControl SIGNED

The **OKControl** property contains the control number (field equate) of the window control that indicates end user acceptance of the window--typically the OK button. The WindowManager uses this property to close the window, or to initiate control and record validation if changes are pending.

Implementation: The WindowManagerClass does not initialize the OKControl property. Your derived Init method should initialize the OKControl property. See the Conceptual Example.

Opened (window opened flag)

Opened BYTE

The **Opened** property indicates whether the WindowManager's WINDOW has been opened. A value of one (1 or True) indicates the WINDOW is open; a value of zero (0 or False) indicates the WINDOW is not opened. You can use this property to control tasks (such as resizing, or saving and restoring window coordinates) that require the WINDOW to be opened or closed.

Implementation: The WindowManagerClass does not set the Opened property. Your derived Init method should set it. See the Conceptual Example.

See Also: Init

OriginalRequest (original database request)

OriginalRequest BYTE

The **OriginalRequest** property indicates the database action for which the procedure was originally called. The WindowManager uses this property to make appropriate processing decisions with regard to priming records, saving or abandoning changes, etc. Valid requests are:

InsertRecord
ChangeRecord
DeleteRecord
SelectRecord

Implementation: The Init method sets the OriginalRequest property to equal the Request property. EQUATEs for the OriginalRequest and Request properties are declared in \LIBSRC\TPLEQU.CLW as follows:

```
InsertRecord  EQUATE (1)  !Add a record
ChangeRecord  EQUATE (2)  !Change the current record
DeleteRecord  EQUATE (3)  !Delete the current record
SelectRecord  EQUATE (4)  !Select a record
```

See Also: Init, Request

OwnerWindow (the Managed owner WINDOW)

OwnerWindow &WINDOW

The **OwnerWindow** property is a reference to the managed owner WINDOW structure. The WindowManager uses this property to associate the owner with an opened WINDOW.

Implementation: The Open method sets the OwnerWindow property

Primary (RelationManager object)

Primary &RelationManager

The **Primary** property is a reference to the RelationManager object for the WindowManager's primary file. The WindowManager uses this property to carry out inserts, changes and deletes.

Implementation: The WindowManagerClass does not initialize the Primary property. Your derived Init method should initialize the Primary property if the procedure does database updates. See the Conceptual Example.

Request (database request)

Request BYTE

The **Request** property indicates the database acion the procedure is handling. The WindowManager uses this property to make appropriate processing decisions with regard to priming records, saving or abandoning changes, etc. Valid requests are:

InsertRecord
ChangeRecord
DeleteRecord
SelectRecord

Implementation: The WindowManagerClass does not set the Request property. Your derived Init method should immediately set the Request property. The WindowManagerClass.Init method sets the OriginalRequest property equal to the Request property to preserve its initial value. See the Conceptual Example.

EQUATEs for the OriginalRequest and Request properties are declared in \LIBSRC\TPLEQU.CLW as follows:

```
InsertRecord  EQUATE (1)  !  Add a record to table
ChangeRecord  EQUATE (2)  !  Change the current record
DeleteRecord  EQUATE (3)  !  Delete the current record
SelectRecord  EQUATE (4)  !  Select the current record
```

See Also: Init, OriginalRequest

ResetOnGainFocus (gain focus reset flag)

ResetOnGainFocus BYTE

The **ResetOnGainFocus** property indicates whether the WindowManager should unconditionally reset itself when the window receives focus. A value of zero (0 or False) allows a conditional reset (reset only if changes demand, for example, when the end user invokes a new BrowseBox sort order or invokes a BrowseBox locator); a value of one (1 or True) forces an unconditional reset (reset regardless of circumstances).

Implementation: The ResetOnGainFocus property defaults to zero (0). The TakeWindowEvent method carries out the action specified by the ResetOnGainFocus property by optionally setting the ForcedReset property to True when the window loses focus.

See Also: ForcedReset

Resize (WindowResize object)

Resize &WindowResizeClass

The **Resize** property is a reference to the WindowResizeClass object that handles window resizing events.

Response (response to database request)

Response BYTE

The **Response** property indicates the WindowManager's response to the original database request (indicated by the OriginalRequest property). The WindowManager uses this property to make appropriate processing decisions with regard to priming records, saving or abandoning changes, etc.

The SetResponse method sets the value of the Response property and exits the procedure.

Implementation: EQUATEs for the Response property are declared in \LIBSRC\TPLEQU.CLW as follows:

```
RequestCompleted        EQUATE (1)              !  Update Completed
RequestCancelled        EQUATE (2)              !  Update Aborted
```

See Also: OriginalRequest, SetResponse

Saved (copy of primary file record buffer)

Saved USHORT, PROTECTED

The **Saved** property locates a copy of the WindowManager's primary file record buffer. The WindowManager uses this property to detect pending changes to the record, and to restore the record if necessary.

The SetSaved method sets the value of the Saved property.

Implementation: The WindowManager uses the FileManager.SaveBuffer, FileManager.RestoreBuffer, and FileManager.EqualBuffer methods (through its Primary property) to manipulate the Saved property.

See Also: FileManager.SaveBuffer, FileManager.RestoreBuffer, FileManager.EqualBuffer

Translator (TranslatorClass object:WindowManager)

Translator &TranslatorClass

The **Translator** property is a reference to the TranslatorClass object for the WindowManager. The WindowManager uses this property to translate window text to the appropriate language.

The AddItem method sets the value of the Translator property.

Implementation: The WindowManagerClass does not initialize the Translator property. The WindowManager only invokes the Translator if the Translator property is not null. Your derived Init method should initialize the Translator property if translation is needed. See the Conceptual Example.

See Also: AddItem

VCRRequest (delayed scroll request)

VCRRequest &LONG

The **VCRRequest** property is a reference to a variable identifying a scroll request made simultaneously with a database operation request. The WindowManager uses this property to carry out the scroll request after it complets the database operation.

For example, when the end user changes fields on a form then presses the Insert button, he simultaneously requests to save the changes and to scroll to the next record. The WindowManager completes the change request , and only then does it handle the scroll request.

Implementation: EQUATEs for the VCRRequest property are declared in \LIBSRC\ABTOOLBA.INC as follows:

```
      ITEMIZE,PRE(VCR)
Forward      EQUATE(Toolbar:Down)   !EQUATE(1)
Backward     EQUATE(Toolbar:Up)     !EQUATE(2), etc..
PageForward  EQUATE(Toolbar:PageDown)
PageBackward EQUATE(Toolbar:PageUp)
First        EQUATE(Toolbar:Top)
Last         EQUATE(Toolbar:Bottom)
Insert       EQUATE(Toolbar:Insert)
None         EQUATE(0)
      END
```

WindowManager Methods

The WindowManager contains the following methods.

WindowManager Functional Organization--Expected Use

As an aid to understanding the WindowManager, it is useful to organize its various methods into two large categories according to their expected use--the Non-Virtual and the virtual methods. This organization reflects what we believe is typical use of the WindowManager methods.

Non-Virtual Methods

The Non-Virtual methods, which you are likely to call fairly routinely from your program, can be further divided into three categories:

Housekeeping (one-time) Use:

Run[v]	run this procedure
Init[v]	initialize the WindowManager object
AddHistoryField	add restorable control and field
AddHistoryFile	add restorable history file
AddItem	program the WindowManager object
AddUpdateFile	register batch add files
Kill[v]	shut down the WindowManager object

Mainstream Use:

None

Occasional Use:

Run[v]	run another procedure
SaveHistory	save history fields for later restoration
PostCompleted	a virtual to prime fields

[v] These methods are also Virtual.

Virtual Methods

Typically you will not call these methods directly--the Non-Virtual methods call them. However, we anticipate you will often want to override these methods, and because they are virtual, they are very easy to override. These methods do provide reasonable default behavior in case you do not want to override them.

Init	initialize the WindowManager object
Ask	display window and process its events
Kill	shut down the WindowManager object
Open	a virtual to execute on EVENT:OpenWindow
PrimeFields	a virtual to prime fields
PrimeUpdate	update or prepare for update
Reset	reset the window and registered items
RestoreField	restore field to last saved value
Run	run this procedure or another procedure
SetAlerts	alert window control keystrokes
SetResponse	OK or Cancel the window
TakeAccepted	a virtual to process EVENT:Accepted
TakeCompleted	a virtual to complete an update form
TakeCloseEvent	a virtual to Cancel the window
TakeEvent	a virtual to process all events
TakeFieldEvent	a virtual to process field events
TakeNewSelection	a virtual to process EVENT:NewSelection
TakeRejected	a virtual to process EVENT:Rejected
TakeSelected	a virtual to process EVENT:Selected
TakeWindowEvent	a virtual to process non-field events
Update	Prepare records for writing to disk

AddHistoryField (add restorable control and field)

AddHistoryField(*control, field* **)**

AddHistoryField Adds a history field to the WindowManager object.

control An integer constant, variable, EQUATE, or expression containing the control number of the control whose contents to restore from the *field*. This is the field equate number of the control.

field An integer constant, variable, EQUATE, or expression containing the position of the field within the history file's record layout. The field is identified by its position in the FILE declaration. A value of one (1) indicates the first field, two (2) indicates the second field, etc. See WHAT and WHERE in the *Language Reference* for more information.

The **AddHistoryField** method adds a history field to the WindowManager object. AddHistoryField associates a window control with its corresponding database field or column, so the WindowManager can restore the control's contents when the end user invokes the history key (or FrameBrowseControl ditto button).

Implementation: The AddHistoryFile method names the file and record buffers from which fields are saved and restored. The AddHistoryField method associates specific fields from the history file with their corresponding WINDOW controls. The SaveHistory method saves a copy of the history fields. The RestoreField method restores the contents of a specific control.

Example:

```
ThisWindow.Init PROCEDURE()
  CODE
 !procedure code
  SELF.HistoryKey = CtrlR
  SELF.AddHistoryFile(CLI:Record,History::CLI:Record)
  SELF.AddHistoryField(?CLI:Name,2)
  SELF.AddHistoryField(?CLI:StateCode,3)
```

See Also: AddHistoryFile, HistoryKey, RestoreField, SaveHistory

AddHistoryFile (add restorable history file)

AddHistoryFile(*record buffer, save buffer* **)**

AddHistoryFile Adds a history file to the WindowManager object.

record buffer The label of the history file's RECORD.

save buffer The label of a STATIC variable declared LIKE(*record buffer*). The WindowManager saves to and restores from this variable.

The **AddHistoryFile** method adds a history file to the WindowManager object. AddHistoryFile sets the file's record buffer and a corresponding save buffer so the WindowManager can restore from the save buffer when the end user invokes the history key (or FrameBrowseControl ditto button).

Implementation: The AddHistoryFile method names the file and record buffers from which fields are saved and restored. The AddHistoryField method associates specific fields from the history file with their corresponding WINDOW controls. The SaveHistory method saves a copy of the history fields. The RestoreField method restores the contents of a specific control.

Example:

```
ThisWindow.Init PROCEDURE()
  CODE
 !procedure code
  SELF.HistoryKey = CtrlR
  SELF.AddHistoryFile(CLI:Record,History::CLI:Record)
  SELF.AddHistoryField(?CLI:Name,2)
  SELF.AddHistoryField(?CLI:StateCode,3)
```

See Also: AddHistoryFile, HistoryKey, RestoreField, SaveHistory

AddItem (program the WindowManager object)

AddItem(| *class* **|)**

| *WindowComponent* |

| *control*, *response* |

AddItem Adds specific functionality to the WindowManager.

class The label of one of the following objects: BrowseClass, ToolbarClass, ToolbarUpdateClass, TranslatorClass, or WindowResizeClass

WindowComponent
The label of a WindowComponent interface.

control An integer constant, variable, EQUATE, or expression containing the control number of the control whose acceptance invokes the *response*— typically OK and Cancel buttons.

response An integer constant, variable, EQUATE, or expression indicating the action to register when the *control* is accepted.

The **AddItem** method registers another ABC Library object with the WindowManager object to add the object's specific functionality to the WindowManager. The AddItem method also registers an interface with the Window Manager's Component List.

Implementation: The TakeAccepted method assigns the *response* value to the Response property when the *control* is accepted. EQUATEs for the *response* parameter are declared in \LIBSRC\TPLEQU.CLW as follows:

```
RequestCompleted EQUATE (1) !Update Completed
RequestCancelled EQUATE (2) !Update Aborted
```

See Also: Response, WindowManager.TakeAccepted

AddUpdateFile (register batch add files)

AddUpdateFile(*file manager* **)**

AddUpdateFile Registers FileManager objects with the WindowManager object.

file manager The label of the FileManager object for the file.

The **AddUpdateFile** method registers FileManager objects with the WindowManager object, for files whose record buffers must be saved and restored to support batch (repetitive) adds.

Implementation: The WindowManager uses the update file's FileManager to save and restore the file's buffer.

The InsertAction property specifies batch adds.

Example:

```
ThisWindow.Init PROCEDURE()
  CODE
 !procedure code
  SELF.AddUpdateFile(Access:Client)
 !procedure code
```

See Also: InsertAction

Ask (display window and process its events:WindowManager)

Ask, VIRTUAL

The **Ask** method displays the window and processes its events.

Implementation: The Run method calls the Ask method only if the Init method returns Level:Benign. Ask RETURNs immediately if the Dead property is True. The Kill method sets the Dead property to True, so calling the Kill method before the Ask method has the effect of shutting down the window procedure before Ask displays the WINDOW.

The Ask method implements the ACCEPT loop for the window and calls the TakeEvent method to handle all events. The ACCEPT loop continues until TakeEvent RETURNs Level:Fatal.

Tip: To shut down the window procedure while the Ask method is running, RETURN Level:Fatal from any of the "Take" methods.

The ACCEPT loop CYCLEs when TakeEvent returns Level:Notify.

Tip: To immediately stop processing for an event (including stopping resizing and alerted keys), RETURN Level:Notify from any of the "Take" methods.

Example:

```
WindowManager.Run PROCEDURE
 CODE
 IF ~SELF.Init()
  SELF.Ask
 END
 SELF.Kill

WindowManager.Ask PROCEDURE
 CODE
 IF SELF.Dead THEN RETURN .
 CLEAR(SELF.LastInsertedPosition)
 ACCEPT
  CASE SELF.TakeEvent()
   OF Level:Fatal
    BREAK
   OF Level:Notify
    CYCLE !Not as dopey at it looks, it is for 'short-stopping' certain events
    END
  END
```

See Also: Dead, Init, Kill, Run, TakeEvent

ChangeRecord(execute change record process)

ChangeRecord, VIRTUAL

The **ChangeRecord** method performs the necessary database change or update operations when called. **ChangeRecord** returns Level:Benign to indicate successful a change operation.

Implementation: The ChangeRecord method is called by the TakeCompleted method when Request is set to ChangeRecord.

Return Data Type: BYTE

Example:

```
WindowManager.TakeCompleted PROCEDURE
  CODE
  SELF.SaveHistory()
  CASE SELF.Request
  OF InsertRecord
    RETURN SELF.InsertAction()
  OF ChangeRecord
    RETURN SELF.ChangeAction()
  OF DeleteRecord
    RETURN SELF.DeleteAction()
  OF SaveRecord
     CASE SELF.OriginalRequest
     OF InsertRecord
        RETURN SELF.SaveOnInsertAction()
     OF ChangeRecord
        RETURN SELF.SaveOnChangeAction()
     END
  END
  RETURN Level:Benign
```

See Also:

TakeCompleted

Request

InsertRecord

DeleteRecord

DeleteRecord(execute delete record process)

DeleteRecord, VIRTUAL

The **DeleteRecord** method performs the necessary database delete operations when called. **DeleteRecord** returns Level:Benign to indicate successful a delete operation.

Implementation: The DeleteRecord method is called by the TakeCompleted method when Request is set to DeleteRecord.

Return Data Type: BYTE

Example:

```
WindowManager.TakeCompleted PROCEDURE
  CODE
  SELF.SaveHistory()
  CASE SELF.Request
  OF InsertRecord
    RETURN SELF.InsertAction()
  OF ChangeRecord
    RETURN SELF.ChangeAction()
  OF DeleteRecord
    RETURN SELF.DeleteAction()
  OF SaveRecord
     CASE SELF.OriginalRequest
     OF InsertRecord
        RETURN SELF.SaveOnInsertAction()
     OF ChangeRecord
        RETURN SELF.SaveOnChangeAction()
     END
  END
  RETURN Level:Benign
```

See Also:

TakeCompleted

Request

ChangeRecord

InsertRecord

Init (initialize the WindowManager object)

Init, VIRTUAL, PROC

The **Init** method initializes the WindowManager object. Init returns Level:Benign to indicate normal initialization.

The Init method both "programs" the WindowManager object and initializes the overall procedure.

The WindowManager may be configured to implement a variety of options regarding update windows (forms). You can use the Init method to configure form behavior by setting the Request, InsertAction, ChangeAction, and DeleteAction properties.

The WindowManager is closely integrated with several other ABC Library objects. You can use the Init method to register these other objects with the WindowManager by calling the AddItem method. The objects can then set each other's properties and call each other's methods as needed to accomplish their respective goals.

Implementation: Typically, the Init method is paired with the Kill method, performing the converse of the Kill method tasks.

The Run method calls the Init method.

Return value EQUATEs are declared in ABERROR.INC.

Tip: To prevent the Ask method from starting, RETURN Level:Notify from the Init method.

Return Data Type: BYTE

Example:

```
MyWindowManager.Run PROCEDURE
 CODE
 IF SELF.Init() = Level:Benign
  SELF.Ask
 END
 SELF.Kill

ThisWindow.Init PROCEDURE()
 CODE
 SELF.Request = GlobalRequest
 PARENT.Init()
 SELF.FirstField = ?Browse:1
 SELF.VCRRequest &= VCRRequest
```

```
SELF.Errors &= GlobalErrors
SELF.AddItem(Toolbar)
CLEAR(GlobalRequest)
CLEAR(GlobalResponse)
SELF.AddItem(?Close,RequestCancelled)
Relate:Client.Open
FilesOpened = True
OPEN(QuickWindow)
SELF.Opened=True
Resizer.Init(AppStrategy:Surface,Resize:SetMinSize)
SELF.AddItem(Resizer)
Resizer.AutoTransparent=True
BRW1.Init|
(?Browse:1,Queue:Browse:1.Position,BRW1::View:Browse,Queue:Browse:1,Relate:Client,SELF
BRW1.Q &= Queue:Browse:1
BRW1::Sort1:StepClass.Init(+ScrollSort:AllowAlpha,ScrollBy:Runtime)
BRW1.AddSortOrder(BRW1::Sort1:StepClass,CLI:NameKey)
BRW1.AddLocator(BRW1::Sort1:Locator)
BRW1::Sort1:Locator.Init(,CLI:Name,1,BRW1)
BRW1.AddField(CLI:Name,BRW1.Q.CLI:Name)
BRW1.AddField(CLI:StateCode,BRW1.Q.CLI:StateCode)
BRW1.AddField(CLI:ID,BRW1.Q.CLI:ID)
BRW1.InsertControl=?Insert:2
BRW1.ChangeControl=?Change:2
BRW1.DeleteControl=?Delete:2
BRW1.AddToolbarTarget(Toolbar)
BRW1.AskProcedure = 1
SELF.SetAlerts()
RETURN Level:Benign
```

See Also: AddItem, Ask, Kill, Run

InsertRecord (execute insert record activity)

InsertRecord, VIRTUAL

The **InsertRecord** method performs the necessary database insert operations when called. **InsertRecord** returns Level:Benign to indicate successful a insert operation.

Implementation: The TakeCompleted method calls the InsertRecord method when Request is set to InsertRecord.

Return Data Type: BYTE

Example:

```
WindowManager.TakeCompleted PROCEDURE
  CODE
  SELF.SaveHistory()
  CASE SELF.Request
  OF InsertRecord
    RETURN SELF.InsertAction()
  OF ChangeRecord
    RETURN SELF.ChangeAction()
  OF DeleteRecord
    RETURN SELF.DeleteAction()
  OF SaveRecord
     CASE SELF.OriginalRequest
     OF InsertRecord
        RETURN SELF.SaveOnInsertAction()
     OF ChangeRecord
        RETURN SELF.SaveOnChangeAction()
     END
  END
  RETURN Level:Benign
```

See Also:

TakeCompleted

Request

ChangeRecord

DeleteRecord

Kill (shut down the WindowManager object)

Kill, VIRTUAL, PROC

The **Kill** method frees any memory allocated during the life of the object and performs any other required termination code. Kill returns a value to indicate the status of the shut down.

Implementation: Kill sets the Dead property to True and returns Level:Benign to indicate a normal shut down. If the Dead property is already set to True, Kill returns Level:Notify to indicate it is taking no additional action.

Typically, the Kill method is paired with the Init method, performing the converse of the Init method tasks.

The Run method calls the Kill method.

Return value EQUATEs are declared in ABERROR.INC.

Return Data Type: BYTE

Example:

```
ThisWindow.Kill PROCEDURE()
 CODE
 IF PARENT.Kill() THEN RETURN Level:Notify.
 IF FilesOpened
  Relate:Defaults.Close
 END
 IF SELF.Opened
  INIMgr.Update('Main',AppFrame)
 END
 GlobalResponse = CHOOSE(LocalResponse=0,RequestCancelled,LocalResponse)
```

See Also: Dead, Init, Run

Open (open and initialize a window structure)

Open, VIRTUAL
Open (*mainwindow, <ownerwindow>*), **VIRTUAL**

mainwindow The label of the window that needs to be opened.

ownerwindow The label of the owner window, if applicable. This is the label of the APPLICATION or WINDOW structure which "owns" the *mainwindow* being opened.

The **Open** method, when called with the *mainwindow* and optional *ownerwindow* parameters, is used to open a window for processing. A *mainwindow* with an *ownerwindow* always appears on top, and is automatically hidden if the *ownerwindow* is minimized or hidden. If the *ownerwindow* is closed, all owned windows are also automatically closed.

The **Open** method when called without parameters, prepares the window for display. It is designed to execute on window opening events such as EVENT:OpenWindow and EVENT:GainFocus, and can optionally translate a window if necessary.

Implementation: The Open method invokes the Translator if present and calls the Reset method to reset the WINDOW.

The TakeWindowEvent method calls the Open method.

Example:

```
ThisWindow.TakeWindowEvent  PROCEDURE
  CODE
  CASE EVENT()
    OF EVENT:OpenWindow
      IF ~BAND(SELF.Inited,1)
        SELF.Open(Window)
      END
    OF EVENT:GainFocus
      IF BAND(SELF.Inited,1)
        SELF.Reset
      ELSE
        SELF.Open
      END
  END
  RETURN Level:Benign

ThisWindow.Open  PROCEDURE
  CODE
    IF ~SELF.Translator&=NULL
      SELF.Translator.TranslateWindow
    END
    SELF.Reset
    SELF.Inited = BOR(SELF.Inited,1)

!Usage with parameter(s):
 SELF.Open(Window)
```

See Also: Reset, TakeWindowEvent, TranslateWindow, OPEN

PostCompleted (initiates final Window processing)

PostCompleted

The **PostCompleted** method initiates final or closedown processing for the window. This process is typically initiated with an "OK" button. The actual processing depends on the type of window defined.

Implementation: The TakeAccepted method calls the PostCompleted method. The ToolbarUpdateClass.TakeEvent also calls PostCompleted. The PostCompleted method initiates AcceptAll mode for update Forms (see SELECT in the *Language Reference* for more information) and POSTs an EVENT:Completed for all other windows.

Example:

```
WindowManager.TakeAccepted PROCEDURE
I LONG,AUTO
A SIGNED,AUTO
 CODE
 A = ACCEPTED()
 IF ~SELF.Toolbar &= NULL
  SELF.Toolbar.TakeEvent(SELF.VCRRequest,SELF)
   IF A = Toolbar:History
    SELF.RestoreField(FOCUS())
   END
 END
 LOOP I = 1 TO RECORDS(SELF.Buttons)
  GET(SELF.Buttons,I)
   IF SELF.Buttons.Control = A
    SELF.SetResponse(SELF.Buttons.Action)
    RETURN Level:Notify
   END
 END
 IF SELF.OkControl AND SELF.OkControl = A
  SELF.PostCompleted
 END
 RETURN Level:Benign
```

See Also: OKControl, TakeAccepted

PrimeFields (a virtual to prime form fields)

PrimeFields, VIRTUAL

The **PrimeFields** method is a virtual placeholder method to prime fields for adding a record. PrimeFields is called *after* the FileManager.PrimeRecord method to allow update form specific field priming.

Example:

```
ThisWindow.PrimeFields PROCEDURE
 CODE
 CLI:StateCode = 'FL'
 PARENT.PrimeFields
```

PrimeUpdate (update or prepare for update)

PrimeUpdate, VIRTUAL, PROC

The **PrimeUpdate** method prepares the record buffer for entering the update form ACCEPT loop. For actions that can be completed without the ACCEPT loop, PrimeUpdate prevents the ACCEPT loop from executing by returning an appropriate value.

PrimeUpdate returns Level:Benign to indicate the record buffer is ready and the update form's ACCEPT loop should execute.

PrimeUpdate returns Level:Fatal to indicate the ACCEPT loop should not execute, either because the record buffer could not be primed, or because PrimeUpdate completed the requested operation and no further action is necessary.

Implementation: The PrimeUpdate method primes the record buffer for inserts, deletes the record for automatic deletes, and saves a copy of the record buffer in all cases.

Return value EQUATEs are declared in ABERROR.INC.

Return Data Type: BYTE

Example:

```
ThisWindow.Init PROCEDURE()
 CODE
 !procedure code
 IF SELF.PrimeUpdate() THEN RETURN Level:Fatal .
 OPEN(ClientFormWindow)
 SELF.SetAlerts()
 RETURN Level:Benign
```

RemoveItem(remove WindowComponent object)

RemoveItem(*WindowComponent***)**

RemoveItem Unregisters a WindowComponent object.

WindowComponent A reference to a *WindowComponent* interface.

The **RemoveItem** method removes a WindowComponent from the WindowManager object. The object was initially registered with the WindowManager by the AddItem method.

See Also: WindowComponent Interface, WindowManager

Reset (reset the window for display)

Reset([*force reset*] **), VIRTUAL**

Reset	Resets the WindowManager object.
force reset	A numeric constant, variable, EQUATE, or expression that indicates whether to conditionally or unconditionally reset the window. A value of one (1 or True) unconditionally resets the window; a value of zero (0 or False) only resets the window if circumstances require, such as a new sort on browse object or a changed reset field on a browse object. If omitted, *force reset* defaults to zero (0).

The **Reset** method resets the WindowManager object and any registered (AddItem) objects. A *force reset* value of one (1 or True) unconditionally resets all the objects and should therefore be used sparingly to enhance performance.

Implementation: The Reset method calls the ResetSort and UpdateWindow methods for each BrowseClass object registered by the AddItem method. It calls the ResetQueue method for each FileDropClass object registered by the AddItem method.

The Open, TakeWindowEvent, and TakeNewSelection methods all call the Reset method.

Example:

```
ThisWindow.TakeWindowEvent PROCEDURE
 CODE
 CASE EVENT()
 OF EVENT:GainFocus
  IF BAND(SELF.Inited,1)
   SELF.Reset
  ELSE
   SELF.Open
  END
 OF EVENT:Sized
  IF BAND(SELF.Inited,2)
   SELF.Reset
  ELSE
   SELF.Inited = BOR(SELF.Inited,2)
  END
 END
 RETURN Level:Benign
```

See Also: AutoRefresh, Open, ResetOnGainFocus, TakeNewSelection, TakeWindowEvent, BrowseClass.AddResetField, BrowseClass.ResetSort, BrowseClass.UpdateWindow

RestoreField (restore field to last saved value)

RestoreField(*control*), VIRTUAL

RestoreField	Restores the contents of the specified control.
control	An integer constant, variable, EQUATE, or expression containing the control number of the control whose contents to restore. This is the field equate number of the control.

The **RestoreField** method restores the contents of the specified control to the value it contained when the record was last saved. The RestoreField only works if the HistoryKey property is set.

Implementation: The AddHistoryFile method names the file and record buffers from which fields are saved and restored. The AddHistoryField method associates specific fields from the history file with their corresponding WINDOW controls. The SaveHistory method saves a copy of the history fields. The RestoreField method restores the contents of a specific control.

Example:

```
WindowManager.TakeAccepted PROCEDURE
A SIGNED,AUTO
 CODE
 A = ACCEPTED()
 IF ~SELF.Toolbar &= NULL
  SELF.Toolbar.TakeEvent(SELF.VCRRequest,SELF)
   IF A = Toolbar:History
    SELF.RestoreField(FOCUS())
   END
 END
 !procedure code
```

See Also: AddHistoryField, AddHistoryFile, HistoryKey, SaveHistory

Run (run this procedure or a subordinate procedure)

Run([*number, request*] **), VIRTUAL, PROC**

Run	Run this procedure, or run the specified subordinate procedure.
number	An integer constant, variable, EQUATE, or expression identifying the subordinate procedure to run. A value of one (1) runs the first procedure, two (2) runs the second procedure, etc. Typically, this is the procedure's position within an EXECUTE structure. If omitted, Run executes the normal WindowManager Init-Ask-Kill sequence.
request	An integer constant, variable, EQUATE, or expression identifying the action (insert, change, delete, select) the subordinate procedure takes. If omitted, Run executes the normal WindowManager Init-Ask-Kill sequence.

The **Run** method executes the normal WindowManager Init-Ask-Kill sequence, or it runs the specified subordinate procedure on the same thread. Run returns a value indicating whether it completed or cancelled the requested operation.

Run
Executes the normal WindowManager Init-Ask-Kill sequence.

Run(*number, request*)
A virtual placeholder method to execute a procedure identified by *number*. This allows other objects and template generated code to invoke subordinate WindowManager procedures by number rather than by name. The procedure runs on the same thread as the calling procedure.

Return Data Type: BYTE

Implementation: Return value EQUATEs are declared in \LIBSRC\TPLEQU.CLW as follows:

```
RequestCompleted  EQUATE (1)  !Update Completed
RequestCancelled  EQUATE (2)  !Update Cancelled
```

Example:

```
!procedure data
 CODE
 ThisWindow.Run                    !normal Init-Ask-Kill sequence

ThisWindow.TakeAccepted PROCEDURE()
 CODE
 !procedure code
 IF SELF.Run(1,SelectRecord) = RequestCompleted !run a procedure on this thread
  CLI:StateCode = ST:StateCode
 ELSE
  SELECT(?CLI:StateCode)
```

```
  CYCLE
 END

BrowseClass.Ask PROCEDURE(BYTE Request)
  CODE
 !procedure code
 Response=SELF.Window.Run(SELF.AskProcedure,Request) !run a procedure on this thread

ThisWindow.Run PROCEDURE                  !do Init-Ask-Kill sequence
 CODE
 IF SELF.Init() = Level:Benign
  SELF.Ask
 END
 SELF.Kill
 RETURN GlobalResponse

ThisWindow.Run PROCEDURE(USHORT Number,BYTE Request) !run a subordinate procedure
 CODE
 GlobalRequest = Request
 EXECUTE Number
  SelectStates
  UpdatePhones
  END
 RETURN GlobalResponse
```

See Also: Init, Ask, Kill

SaveHistory (save history fields for later restoration)

SaveHistory, PROTECTED

The **SaveHistory** method saves a copy of the fields named by the AddHistoryField method for later restoration by the RestoreField method.

Implementation: The AddHistoryFile method names the file and record buffers from which fields are saved and restored. The AddHistoryField method associates specific fields from the history file with their corresponding WINDOW controls. The SaveHistory method saves a copy of the history fields. The RestoreField method restores the contents of a specific control.

Example:

```
WindowManager.TakeCompleted PROCEDURE
 CODE
 SELF.SaveHistory
 CASE SELF.Request
 OF InsertRecord
  DO InsertAction
 OF ChangeRecord
  DO ChangeAction
 OF DeleteRecord
  DO DeleteAction
 END
```

See Also: RestoreField AddHistoryField, AddHistoryFile, HistoryKey,

SaveOnChangeAction(execute change record process and remain active)

SaveOnChangeAction, VIRTUAL

The **SaveOnChangeAction** method performs the necessary database change or update operations when called. **SaveOnChangeAction** returns Level:Benign to indicate a successful change operation.

Implementation: The SaveOnChangeAction method is called by the TakeCompleted method when Request is set to SaveRecord and OriginalRequest is set to ChangeRecord.

Return Data Type: BYTE

Example:

```
WindowManager.TakeCompleted PROCEDURE
  CODE
  SELF.SaveHistory()
  CASE SELF.Request
  OF InsertRecord
    RETURN SELF.InsertAction()
  OF ChangeRecord
    RETURN SELF.ChangeAction()
  OF DeleteRecord
    RETURN SELF.DeleteAction()
  OF SaveRecord
     CASE SELF.OriginalRequest
     OF InsertRecord
        RETURN SELF.SaveOnInsertAction()
     OF ChangeRecord
        RETURN SELF.SaveOnChangeAction()
     END
  END
  RETURN Level:Benign
```

See Also:

TakeCompleted

Request

SaveOnInsertAction(execute insert record activity and remain active)

SaveOnInsertAction, VIRTUAL

The **SaveOnInsertAction** method performs the necessary database insert operations when called. **SaveOnInsertAction** returns Level:Benign to indicate a successful insert operation.

Implementation: The SaveOnInsertAction method is called by the TakeCompleted method when Request is set to SaveRecord and OriginalRequest is set to InsertRecord.

Return Data Type: BYTE

Example:

```
WindowManager.TakeCompleted PROCEDURE
  CODE
  SELF.SaveHistory()
  CASE SELF.Request
  OF InsertRecord
    RETURN SELF.InsertAction()
  OF ChangeRecord
    RETURN SELF.ChangeAction()
  OF DeleteRecord
    RETURN SELF.DeleteAction()
  OF SaveRecord
     CASE SELF.OriginalRequest
     OF InsertRecord
        RETURN SELF.SaveOnInsertAction()
     OF ChangeRecord
        RETURN SELF.SaveOnChangeAction()
     END
  END
  RETURN Level:Benign
```

See Also:

TakeCompleted

Request

SetAlerts (alert window control keystrokes)

SetAlerts, VIRTUAL

The **SetAlerts** method alerts any required keystrokes for the window's controls, including keystrokes required by the window's history key, browse lists, and locators.

Implementation: The SetAlerts method calls the BrowseClass.SetAlerts method for each BrowseClass object added by the AddItem method. SetAlerts also ALRTs the HistoryKey keystroke for each AddHistoryField control.

Note that the alerted keystrokes are associated only with the specific affected controls, such as a LIST or ENTRY. The keystrokes are not alerted for the WINDOW. See ALRT in the *Language Reference* for more information.

Example:

```
ThisWindow.Init PROCEDURE()
 CODE
 !procedure code
 SELF.SetAlerts()
 RETURN Level:Benign
```

See Also: AddHistoryField, HistoryKey, BrowseClass.SetAlerts

SetResponse (OK or Cancel the window)

SetResponse(*response* **), VIRTUAL**

SetResponse Initiates standard "OK" or "Cancel" processing.

response An integer constant, variable, EQUATE, or expression indicating the WindowManager's response (OK or Cancel) to the requested operation.

The **SetResponse** method initiates standard "OK" or "Cancel" processing for the procedure. That is, it registers the procedure's result (completed or cancelled) and triggers the normal procedure shut down.

Implementation: The TakeAccepted method calls the SetResponse method. SetResponse sets the Response property and POSTs an EVENT:CloseWindow. If the *response* is RequestCancelled, SetResponse also sets the VCRRequest property to VCR:None.

EQUATEs for the response parameter are declared in \LIBSRC\TPLEQU.CLW. as follows:

```
RequestCompleted  EQUATE (1)  !Update Completed
RequestCancelled  EQUATE (2)  !Update Aborted
```

Example:

```
WindowManager.TakeAccepted PROCEDURE
I LONG,AUTO
A SIGNED,AUTO
 CODE
 A = ACCEPTED()
 !procedure code
 LOOP I = 1 TO RECORDS(SELF.Buttons)
  GET(SELF.Buttons,I)
  IF SELF.Buttons.Control = A
   SELF.SetResponse(SELF.Buttons.Action)
   RETURN Level:Notify
  END
 END
 !procedure code
 RETURN Level:Benign
```

See Also: Request, Response

TakeAccepted (a virtual to process EVENT:Accepted--WindowManager)

TakeAccepted, VIRTUAL, PROC

The **TakeAccepted** method processes EVENT:Accepted events for the window's controls, and returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeAccepted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: TakeAccepted carries out HistoryKey and 2 parameter AddItem actions.

Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeAccepted method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
 CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: AddItem, HistoryKey, TakeEvent

TakeCloseEvent (a virtual to Cancel the window)

TakeCloseEvent, VIRTUAL, PROC

The **TakeCloseEvent** method processes EVENT:CloseWindow and EVENT:CloseDown events for the window and returns a value indicating whether window ACCEPT loop processing is complete and should stop.

TakeCloseEvent implements the default processing when the end user cancels an update form (presses the Cancel button). The actual process depends on the value of various WindowManager properties, including Request, Response, CancelAction, OriginalRequest, etc.

TakeCloseEvent returns returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeEvent method calls the TakeCloseEvent method. The TakeCloseEvent method undoes any processing rendered invalid by the form cancellation (for example, deleting a dummy autoincremented record that is no longer needed).

Return values are declared in ABERROR.INC.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
 CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
```

```
IF FIELD()
 RVal = SELF.TakeFieldEvent()
END
RETURN RVal
```

See Also: CancelAction, Request, Response, OriginalRequest, TakeEvent

TakeCompleted (a virtual to complete an update form)

TakeCompleted, VIRTUAL, PROC

The **TakeCompleted** method processes the EVENT:Completed event for the window and returns a value indicating whether window ACCEPT loop processing is complete and should stop.

TakeCompleted implements the default processing when the end user accepts an update form (presses the OK button). The actual process depends on the value of various WindowManager properties, including Request, InsertAction, VCRRequest, etc.

TakeCompleted returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: The TakeCompleted method calls the SaveHistory method, then completes the requested action (insert, change, or delete), subject to various validation constraints. That is the FileManager object validates form fields and does concurrency checking, and the RelationManager object enforces any referential constraints.

TakeCompleted sets the Response property and POSTs an EVENT:CloseWindow when appropriate.

Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeCompleted method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
  IF ~FIELD()
   RVal = SELF.TakeWindowEvent()
   IF RVal THEN RETURN RVal.
  END
  CASE EVENT()
   OF EVENT:Accepted;RVal = SELF.TakeAccepted()
   OF EVENT:Rejected;RVal = SELF.TakeRejected()
   OF EVENT:Selected;RVal = SELF.TakeSelected()
   OF EVENT:NewSelection;RVal = SELF.TakeNewSelection()
   OF EVENT:Completed;RVal = SELF.TakeCompleted()
```

```
   OF EVENT:CloseWindow OROF EVENT:CloseDown
    RVal = SELF.TakeCloseEvent()
  END
  IF RVal THEN RETURN RVal.
  IF FIELD()
   RVal = SELF.TakeFieldEvent()
  END
  RETURN RVal
```

See Also: InsertAction, Request, Response, TakeEvent, VCRRequest

TakeEvent (a virtual to process all events:WindowManager)

TakeEvent, VIRTUAL, PROC

The **TakeEvent** method processes all window events and returns a value indicating whether ACCEPT loop processing is complete and should stop. TakeEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Return values are declared in ABERROR.INC.

The Ask method calls the TakeEvent method.

Return Data Type: BYTE

Example:

```
WindowManager.Ask PROCEDURE
 CODE
 IF SELF.Dead THEN RETURN .
 CLEAR(SELF.LastInsertedPosition)
 ACCEPT
  CASE SELF.TakeEvent()
  OF Level:Fatal
   BREAK
  OF Level:Notify
   CYCLE !Not as dopey at it looks, it is for 'short-stopping' certain events
  END
 END
```

See Also: Ask

TakeFieldEvent (a virtual to process field events:WindowManager)

TakeFieldEvent, VIRTUAL, PROC

The **TakeFieldEvent** method is a virtual placeholder to process all field-specific/control-specific events for the window. It returns a value indicating whether window process is complete and should stop. TakeFieldEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeFieldEvent method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
 CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: Ask

TakeNewSelection (a virtual to process EVENT:NewSelection)

TakeNewSelection, VIRTUAL, PROC

The **TakeNewSelection** method processes EVENT:NewSelection events for the window's controls and returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeNewSelection returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: TakeNewSelection resets the WindowManager when the end user selects a new TAB.

Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeNewSelection method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
RVal BYTE(Level:Benign)
I    USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: TakeEvent

TakeNotify (a virtual to process EVENT:Notify)

TakeNotify (*notifycode*, *thread***,** *parameter* **),VIRTUAL, PROC**

notifycode an UNSIGNED variable that receives a notify code value passed by the sender with a NOTIFY statement.

thread an optional SIGNED variable that receives the number of the sender's thread parameter.

parameter a LONG variable that receives the parameter passed by the sender with a NOTIFY statement.

TakeNotify is a virtual method used to process valid EVENT:Notify events for the window's controls and returns a *Level:Benign* value by default. This method is called if EVENT:Notify is received by the window, and the NOTIFICATION function (and subsequently this method) returns TRUE if the *parameter* values match the values from the NOTIFY function that posted the event.

Implementation: TakeNotify is called by the TakeWindowEvent method if a valid notification is detected.

Return Data Type: BYTE

Example:

```
WindowManager.TakeWindowEvent      PROCEDURE
RVal BYTE(Level:Benign)
NotifyCode      UNSIGNED
NotifyThread    SIGNED
NotifyParameter LONG
  CODE
  CASE EVENT()
  OF EVENT:Notify
    IF NOTIFICATION(NotifyCode,NotifyThread,NotifyParameter)
      RVal = SELF.TakeNotify(NotifyCode,NotifyThread,NotifyParameter)
    END
  END
```

See Also: NOTIFICATION, NOTIFY

TakeRejected (a virtual to process EVENT:Rejected)

TakeRejected, VIRTUAL, PROC

The **TakeRejected** method processes EVENT:Rejected events for the window's controls and returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeRejected returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: TakeRejected sounds the audible alarm and returns focus to the offending (rejected) control.

Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeRejected method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval  BYTE(Level:Benign)
I    USHORT,AUTO
 CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: TakeEvent

TakeSelected (a virtual to process EVENT:Selected)

TakeSelected, VIRTUAL, PROC

The **TakeSelected** method is a virtual placeholder to process EVENT:Selected events for the window's controls. It returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeSelected returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeSelected method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
  CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: TakeEvent

TakeWindowEvent (a virtual to process non-field events:WindowManager)

TakeWindowEvent, VIRTUAL, PROC

The **TakeWindowEvent** method processes all non-field events for the window and returns a value indicating whether window ACCEPT loop processing is complete and should stop. TakeWindowEvent returns Level:Benign to indicate processing of this event should continue normally; it returns Level:Notify to indicate processing is completed for this event and the ACCEPT loop should CYCLE; it returns Level:Fatal to indicate the event could not be processed and the ACCEPT loop should BREAK.

Implementation: TakeWindowEvent implements standard handling of EVENT:OpenWindow Open method), EVENT:LoseFocus, EVENT:GainFocus (Reset method), and EVENT:Sized (WindowResizeClass.Resize method).

Return values are declared in ABERROR.INC.

The TakeEvent method calls the TakeWindowEvent method.

Return Data Type: BYTE

Example:

```
MyWindowManager.TakeEvent PROCEDURE
Rval BYTE(Level:Benign)
I   USHORT,AUTO
 CODE
 IF ~FIELD()
  RVal = SELF.TakeWindowEvent()
  IF RVal THEN RETURN RVal.
 END
 CASE EVENT()
 OF EVENT:Accepted;   RVal = SELF.TakeAccepted()
 OF EVENT:Rejected;   RVal = SELF.TakeRejected()
 OF EVENT:Selected;   RVal = SELF.TakeSelected()
 OF EVENT:NewSelection; RVal = SELF.TakeNewSelection()
 OF EVENT:Completed;   RVal = SELF.TakeCompleted()
 OF EVENT:CloseWindow OROF EVENT:CloseDown
  RVal = SELF.TakeCloseEvent()
 END
 IF RVal THEN RETURN RVal.
 IF FIELD()
  RVal = SELF.TakeFieldEvent()
 END
 RETURN RVal
```

See Also: Open, Reset, TakeEvent, WindowResizeClass.Resize

Update (prepare records for writing to disk)

Update, VIRTUAL

The **Update** method prepares the WindowManager's FILE and VIEW records for writing to disk by synchronizing buffer contents with their corresponding screen values. The Update method also arms automatic optimistic concurrency checking so an eventual write (PUT) to disk returns an error if another user changed the data since it was retrieved.

Implementation: The Update method calls BrowseClass.UpdateViewRecord for each BrowseClass object added by the AddItem method.

Example:

```
ThisWindow.TakeAccepted PROCEDURE()
Looped BYTE
 CODE
 LOOP
  IF Looped
   RETURN Level:Notify
  ELSE
   Looped = 1
  END
  PARENT.TakeAccepted()
  CASE ACCEPTED()
  OF ?Expand
   ThisWindow.Update
   ?CusTree{PropList:MouseDownRow} = CHOICE(?CusTree)
   DO REL1::ExpandAll
  OF ?Contract
   ThisWindow.Update
   ?CusTree{PropList:MouseDownRow} = CHOICE(?CusTree)
   DO REL1::ContractAll
  OF ?Insert
   ThisWindow.Update
   ?CusTree{PropList:MouseDownRow} = CHOICE(?CusTree)
   DO REL1::AddEntry
  OF ?Change
   ThisWindow.Update
   ?CusTree{PropList:MouseDownRow} = CHOICE(?CusTree)
   DO REL1::EditEntry
  OF ?Delete
   ThisWindow.Update
   ?CusTree{PropList:MouseDownRow} = CHOICE(?CusTree)
   DO REL1::RemoveEntry
  END
  RETURN Level:Benign
```

Index:

_Print (print rich text control contents) 305
_Print print a Crystal Report.....283
ABC Template Implementation 338, 969, 1111, 1179
ACCEPT.....1363
ActiveInvisible.....150
BrowseClass.....150
ActiveInvisible (obscured browse list action) 150
AddBreak.....123
AddControl 463
AddEditControl 174
BrowseClass.....174
AddEditControl (specify custom edit-in-place class) 174
AddErrors 504
ErrorClass.....504
AddErrors (add or override recognized errors) 504
AddField 175, 591
BrowseClass.....175
FileDropClass 591
AddField (specify a FILE/QUEUE field pair) 175
AddField (specify display fields).....591
AddField(track fields in a structure) 616
AddHistory (update History structure).....505
AddHistoryField.....1359
WindowManagerClass.....1359
AddHistoryField (add restorable control and field).....1359
AddHistoryFile.....1360
WindowManagerClass.....1360
AddHistoryFile (add restorable history file) 1360
AddItem.....104, 256, 552, 847, 1130, 1247, 1361
AsciiViewerClass 104
FieldPairsClass.....552
PopupClass 847
QueryClass.....925
StepCustomClass.....1130
WindowManagerClass.....1361
AddItem (add a step marker) 1130
AddItem (add field to query).....925
AddItem (add menu item).....847
AddItem (maintain the columninfo structure) 316
AddItem (maintain the namequeue structure).....327
AddItem (program the AsciiViewer object) 104
AddItem (program the WindowManager object) 1361
AddItem(program the BrowseClass object) 176
AddItem(program the ReportManager object) 1044
AddItemEvent.....849
PopupClass.....849
AddItemEvent (set menu item action) 849
AddItemMimic.....850
PopupClass.....850
AddItemMimic (tie menu item to a button) 850
AddKey.....617
FileManagerClass.....617
AddKey (set the file's keys) 617
AddLocator 176
BrowseClass.....176
AddLocator (specify a locator).....770
AddLocator (specify a locator).....176
AddLogFile (maintain log file structure)...317
AddMask.....1102
SelectFileClass 1102
AddMask (add file dialog file masks).....1102
AddMenu 851
PopupClass.....851
AddPair.....238, 553
BufferedPairsClass 239
FieldPairsClass.....553
AddPair (add a field pair).....238, 553
AddRange.....1285
ViewManagerClass.....1285
AddRange (add a range limit) 1285
AddRecord (add a record filedrop queue) 573
AddRelation.....1012
RelationManagerClass 1012
AddRelation (set a file relationship) 1012

AddRelationLink 1014
AddResetField 177
  BrowseClass 177
AddResetField (set a field to monitor for changes) 177
AddSortOrder 178, 1286
  BrowseClass 178
  ViewManagerClass 1286
AddSortOrder (add a sort order) 1286
AddSortOrder (specify a browse sort order) 178
AddSubMenu 852
  PopupClass 852
AddTarget 1191
  ToolbarClass 1191
AddTarget (register toolbar driven entity) 1191
AddThread (maintains the triggerqueue) 327
AddToolbarTarget 179
  BrowseClass 179
AddToolbarTarget (set the browse toolbar) 179
AddTranslation 1265, 1266
  TranslatorClass 1265, 1266
AddTranslation (add translation pairs) .. 1265
AddUpdateField 592
  FileDropClass 592
AddUpdateField (specify field assignments) 592
AddUpdateFile 1362
  WindowManagerClass 1362
AddUpdateFile (register batch add files) 1362
AddValue
  EditMultiSelectClass 437
AddValue (prime the MultiSelect dialog) . 437
Again 454
AliasedFile 606
  FileManagerClass 606
AliasedFile (the primary file) 606
AlinkLookup (associative link lookup) ... 1172
AllowReset 588
AllowUnfilled 151
  BrowseClass 151
AllowUnfilled (display filled list) 151
AllowUserZoom 878
  PrintPreviewClass 878
AllowUserZoom (allow any zoom factor) . 878
AllText 733
AppendOrder 1287
  ViewManagerClass 1287
AppendOrder (refine a sort order) 1287
ApplyFilter 1288
  ViewManagerClass 1288
ApplyFilter (range limit and filter the result set) 1288
ApplyOrder 1289
  ViewManagerClass 1289
ApplyOrder (sort the result set) 1289
ApplyRange 180, 1290
  BrowseClass 180
  ViewManagerClass 1290
ApplyRange (conditionally range limit and filter the result set) 1290
ApplyRange (refresh browse based on resets and range limits) 180
Arrow 454
ArrowAction 152
  BrowseClass 152
ArrowAction (edit-in-place action on arrow key) 152
ASCIIFile 64
  ASCIIFileClass 64
ASCIIFile (the ASCII file) 64
ASCIIFileClass 97, 98
ASCIIFileClass Functional Organization—Expected Use 65
ASCIIFileClass Overview 61
ASCIIPrintClass 97, 98
ASCIIPrintClass Overview 79
ASCIISearchClass 97, 98
ASCIISearchClass Overview 87
ASCIIViewerClass 97, 98, 99
AsciiViewerClass Functional Organization—Expected Use 102
ASCIIViewerClass Overview 97
Ask
  ASCIIPrintClass 83
  ASCIISearchClass 92
  BrowseClass 181
  FileDropComboClass 573
  PopupClass 853
  QueryClass 927
  QueryFormClass 950

ReportManagerClass....1044
SelectFileClass....1103
ASK ..83, 92, 181, 183, 573, 853, 976, 1044, 1103, 1363
Ask (a virtual to accept query criteria)....927
Ask (add a record to the lookup file)....573
Ask (display the popup menu)....853
Ask (display window and process its events)....1044
Ask (display Windows file dialog)....1103
Ask (solicit print specifications)....83
Ask (solicit query criteria QueryListClass)....976
Ask (solicit query criteria)....950
Ask (solicit search specifications)....92
Ask (update selected browse item)....181
AskGotoLine....105
ASCIIViewerClass....105
AskGotoLine (go to user specified line)..105
AskPage....884
PrintPreviewClass....884
AskPreview....1045
ReportManagerClass....1045
AskPreview (preview or print the report)1045
AskPrintPages....885
AskProcedure....153
BrowseClass....153
AskProcedure (update procedure)..153, 568
AskRecord
BrowseClass....183
AskThumbnails....887
PrintPreviewClass....887
AskThumbnails (prompt for new thumbnail configuration)....887
AssignBufferToLeft....240
BufferedPairsClass....240
AssignBufferToLeft (copy from "buffer" fields to "left" fields)....240
AssignBufferToRight....241
BufferedPairsClass....241
AssignBufferToRight (copy from "buffer" fields to "right" fields)....241
AssignLeftToBuffer....242
BufferedPairsClass....242
AssignLeftToBuffer (copy from "left" fields to "buffer" fields)....242
AssignLeftToRight....555
FieldPairsClass....555
AssignLeftToRight (copy from "left" fields to "right" fields)....555
AssignRightToBuffer....243
BufferedPairsClass....243
AssignRightToBuffer (copy from "right" fields to "buffer" fields)....243
AssignRightToLeft....556
FieldPairsClass....556
AssignRightToLeft (copy from "right" fields to "left" fields)....556
Attribute....1034
autoincrement....619, 657, 660
AutoRefresh....1343
WindowManagerClass....1343
AutoRefresh (reset window as needed flag)....1343
AutoToolbar....1343
WindowManagerClass....1343
AutoToolbar (set toolbar target on new tab selection)....1343
AutoTransparent....1319
WindowResizeClass....1319
AutoTransparent (optimize redraw)....1319
background processes
ReportManagerClass....1041
BC....137
BC (browse class)....137
BeforeChange (update audit log file before file change)....318, 781
BeginRefresh....733
begins with
Filter Locator....695
BindFields....618
FileManagerClass....618
BindFields (bind fields when file is opened)....618
BreakMan....1034
Browse....1202
initial position....167
ToolbarListBoxClass....1202
Browse (BrowseClass object)....226, 1202
BrowseBox
reset....173
BrowseClass....145, 146, 147
methods....172
properties....150

BrowseClass Functional Organization--Expected Use 172
BrowseClass Methods 172
BrowseClass Overview 145
BrowseClass Properties 150
BrowseEIPManagerClass 131
BrowseEIPManagerClass Concepts 132
BrowseEIPManagerClass Properties 137
BrowseEIPManagerClass Source Files 133
BrowseEIPManagerClass--ABC Template Implementation 133
BrowseEIPManagerClass--Conceptual Example 134
BrowseEIPManagerClass--Functional Organization--Expected Use 138
BrowseEIPManagerClass--Overview 131
BrowseEIPManagerClass--Relationship to Other Application Builder Classes 133
BrowseQueue Concepts 221
BrowseQueue Source Files 221
BrowseToolbarClass ABC Template Implementation 225
BrowseToolbarClass Concepts 225
BrowseToolbarClass Overview 225
BrowseToolbarClass Source Files 225
Buffer
FileManagerClass 607
BUFFER 607
Buffer (the record buffer) 607
buffer management 547
BufferedPairsClass
methods 236
properties 235
BufferedPairsClass Functional Organization—Expected Use 236
BufferedPairsClass Methods 236
BufferedPairsClass Overview 233
BufferedPairsClass Properties 235
Buffers 607
FileManagerClass 607
Buffers (saved record buffers) 607
Button (toolbar buttons FEQ values) 227
ButtonTypes (standard windows buttons) 836
CalcBestPositionNodeText 734
CalcCurrentGraph 734
CalcCurrentNode 735
CalcGraph 735
CalcPopup 736
CalcPopupAdd2 737
CancelAction 1344
WindowManagerClass 1344
CancelAction (response to cancel request) 1344
CancelAutoInc 619, 620, 621, 1016
FileManagerClass 619
RelationManagerClass 1016
CancelAutoInc (undo autoincrement) 1016
CancelAutoInc (undo PrimeAutoInc) 619
CancelPrintReport 1046
CanRedo (check for redo data) 293
Caption (window title) 836
CaseSensitiveValue (case sensitive flag) 907
ChangeAction 1345
WindowManagerClass 1345
ChangeAction (response to change request) 1345
ChangeButton 1217
ToolbarTargetClass 1217
ChangeButton (change control number) 1217
ChangeControl 153
BrowseClass 153
ChangeField (virtual method for managing field changes) 782
ChangeFontStyle (set current font style) 293
ChangeRecord 1364
CheckChanges(check record for changes) 328
CheckPair(check field pairs for changes) 328
Children (reference to child group controls) 766
Choice(returns current selection number) 785
Chosen (current browse queue element) 766
ClearColumn 139, 464
ClearColumn (reset column property values EIPManagerClass) 464
ClearColumn (reset column property values) 139
ClearKey 622
FileManagerClass 622
ClearKey (clear specified key components) 622
ClearKeycode 845
PopupClass 845

ClearKeycode (clear KEYCODE character) 845
ClearLeft 557
  FieldPairsClass 557
ClearLeft (clear each "left" field) 557
ClearQuery 928
ClearQuery (remove loaded query) 928
ClearRight 558
  FieldPairsClass 558
ClearRight (clear each "right" field) 558
ClickPress (forward control) 767
Close
  FileManagerClass 624
  RelationManagerClass 1017
  ViewManagerClass 1291
CLOSE 624, 1017, 1291
Close (close a file and any related files) 1017
Close (close standarderrorlog file) 1113
Close (close the file) 624
Close (close the view) 1291
Close (initiate close of log file) 544
CloseHelp (close HTML help file) 1173
COLUMN 454
ConfirmPages 878
ConstantClass Functional Organization—Expected Use 255
ConstantClass Overview 249
Construct (initialize FuzzyClass object) .. 700
Construct (initialize StandardErrorLogClass object) 1113
Control 825, 1217
  LocatorClass 825
  ToolbarTargetClass 1217
Control (the locator control number) 825
Control (window control) 1217
ControlBase (base control number) 767
ControlNumber (number of controls) 767
Controls 1117
  StepClass 1117
Controls (the StepClass sort sequence) 1117
CREATE 608
CreateControl 357, 447
  EditCheckClass 392, 404
  EditClass 345
  EditColorClass 375, 414
  EditFontClass 425
CreateControl (a virtual to create the edit control) 345
CreateControl (create the edit-in-place CHECK control) 366
CreateControl (create the edit-in-place COMBO control) 384
CreateControl (create the edit-in-place control) 375, 414, 425
CreateControl (create the edit-in-place DROPLIST control) 392
CreateControl (create the edit-in-place ENTRY control) 404
CreateControl (create the edit-in-place SPIN control) 357
CreateHeader (create log file header records) 318
Crystal8 Class 265
Crystal8 Class Properties 266
CurrentPage 879
  PrintPreviewClass 879
CurrentPage (the selected report page) .. 879
cwRTF ABC Template Implementation ... 290
cwRTF Class Concepts 289
cwRTF Overview 289
cwRTF Properties 291
cwRTF Relationship to Other Application Builder Classes 290
cwRTF Source Files 290
Database Operations
  FileManagerClass 613
DbAuditManager ABC Template Implementation 313
DbAuditManager Methods 316
DbAuditManager Properties 314
DbAuditManager Source Files 313
DbChangeManager ABC Template Implementation 325
DbChangeManager Methods 327
DbChangeManager Overview 325
DbChangeManager Properties 326
DbChangeManager Source Files 325
DbLogFileManager ABC Template Implementation 333
DbLogFileManager Methods 335
DbLogFileManager Overview 333
DbLogFileManager Properties 334
DbLogFileManager Source Files 333

Dead 1345
WindowManagerClass 1345
Dead (shut down flag) 1345
DefaultCategory (error category) 496
DefaultDirectory 1100
SelectFileClass 1100
DefaultDirectory (initial path) 1100
DefaultFile 1100
SelectFileClass 1100
DefaultFile (initial filename/filemask) 1100
DefaultFill 588
FileDropClass 588
DeferMoves 1319
WindowResizeClass 1319
DeferMoves (optimize resize) 1319
DeferOpenReport 1035
ReportManagerClass 1035
DeferOpenReport (defer open) 1035
DeferWindow 1035
Delete
RelationManagerClass 1018
DELETE 929, 1018
Delete (remove saved query) 929
Delete (delete record subject to referential constraints) 1018
DeleteAction 1346
WindowManagerClass 1346
DeleteAction (response to delete request) 1346
DeleteButton 1218
DeleteButton (delete control number) 1218
DeleteControl 154
BrowseClass 154
Deleted (return record status) 625
DeleteImageQueue 888
DeleteItem 854
PopupClass 854
DeleteItem (remove menu item) 854
DeleteRecord 1365
DeleteRecord (delete a record) 626
Destruct (automatic destructor) 627
Destruct (remove the StandardErrorLogClass object) 1113
DiagramNameText 738, 739
DiagramText 738, 739
DISPLAY 889
DisplayButtons 1192, 1203, 1213, 1222, 1238
ToolbarClass 1192
ToolbarListBoxClass 1203
ToolbarReltreeClass 1213
ToolbarTargetClass 1222
ToolbarUpdateClass 1238
DisplayButtons (enable appropriate toolbar buttons) 1192, 1203, 1213, 1222, 1238
DisplayPage 106
ASCIIViewerClass 106
DisplayPage (display new page) 106
Draw 740
DrawGraph 740
DrawReport 741
DrawWallpaper 741
DrillDown 742
ECOn (current state of entry completion) 568
EditCheckClass 359
CreateControl 366, 392, 404
methods 365
properties 364
EditCheckClass ABC Template Implementation 359
EditCheckClass Concepts 359
EditCheckClass Conceptual Example 361
EditCheckClass Functional Organization—Expected Use 365
EditCheckClass Methods 365
EditCheckClass Overview 359
EditCheckClass Properties 364
EditCheckClass Relationship to Other Application Builder Classes 359
EditCheckClass Source Files 359
EditClass 337
CreateControl 345
FEQ 343
Init 346
Kill 347
methods 346
SetAlerts 347, 393
TakeEvent 349
EditClass Concepts 337
EditClass Conceptual Example 339
EditClass Overview 337
EditClass Properties 343
EditClass Source Files 338

EditColorClass.....367
CreateControl.....375, 414
properties.....373
TakeEvent.....376, 415
Title.....373
EditColorClass ABC Template Implementation.....367
EditColorClass Concepts.....367
EditColorClass Conceptual Example.....369
EditColorClass Functional Organization--Expected Use.....374
EditColorClass Properties.....373
EditColorClass Relationship to Other Application Builder Classes.....367
EditColorClass Source Files.....368
EditColorClassOverview.....367
EditDropComboClass ABC Template Implementation.....377
EditDropComboClass Concepts.....377
EditDropComboClass Conceptual Example.....379
EditDropComboClass Functional Organization.....383
EditDropComboClass Methods.....383
EditDropComboClass Overview.....377
EditDropComboClass Properties.....382
EditDropComboClass Source Files.....378
EditDropListClass.....385
properties.....390
EditDropListClass ABC Template Implementation.....385
EditDropListClass Concepts.....385
EditDropListClass Conceptual Example.387
EditDropListClass Functional Organization--Expected Use.....391
EditDropListClass Overview.....385
EditDropListClass Properties.....390
EditDropListClass Relationship to Other Application Builder Classes.....385
EditDropListClass Source Files.....385
EditEntryClass.....397
methods.....403
properties.....402
EditEntryClass ABC Template Implementation.....398
EditEntryClass Concepts.....397
EditEntryClass Conceptual Example.....398
EditEntryClass Functional Organization--Expected Use.....403
EditEntryClass Methods.....403
EditEntryClass Overview.....397
EditEntryClass Properties.....402
EditEntryClass Relationship to Other Application Builder Classes.....397
EditEntryClass Source Files.....398
EditFileClass.....405
FileMask.....411
FilePattern.....411
properties.....411
Title.....412
EditFileClass ABC Template Implementation.....405
EditFileClass Concepts.....405
EditFileClass Conceptual Example.....407
EditFileClass Functional Organization--Expected Use.....413
EditFileClass Overview.....405
EditFileClass Properties.....411
EditFileClass Relationship to Other Application Builder Classes.....405
EditFileClass Source Files.....406
EditFontClass.....417
CreateControl.....425
methods.....424
properties.....423
TakeEvent.....426
Title.....423
EditFontClass ABC Template Implementation.....417
EditFontClass Concepts.....417
EditFontClass Conceptual Example.....419
EditFontClass Functional Organization--Expected Use.....424
EditFontClass Methods.....424
EditFontClass Overview.....417
EditFontClass Properties.....423
EditFontClass Relationship to Other Application Builder Classes.....417
EditFontClass Source Files.....418
EditList.....155
BrowseClass.....155
EditList (list of edit-in-place controls).....155
EditMultiSelectClass.....427
AddValue.....437

CreateControl 438
methods 435
properties 434
Reset 438
TakeAction 439, 440
TakeEvent 442
Title 434
EditMultiSelectClass ABC Template Implementation 428
EditMultiSelectClass Concepts 427
EditMultiSelectClass Conceptual Example 429
EditMultiSelectClass Functional Organization--Expected Use 435
EditMultiSelectClass Methods 435
EditMultiSelectClass Overview 427
EditMultiSelectClass Properties 434
EditMultiSelectClass Relationship to Other Application Builder Classes 427
EditMultiSelectClass Source Files 428
EditSpinClass 351
EditSpinClass -- Relationship to Other Application Builder Classes 351
EditSpinClass Concepts 351
EditSpinClass Methods 356
EditSpinClass Properties 355
EditSpinClass Source Files 351
EditSpinClass--ABC Template Implementation 351
EditSpinClass--Conceptual Example 352
EditSpinClass--Functional Organization—Expected Use 356
EditSpinClass--Overview 351
EditTextClass Overview 443
EditTextClass Methods 446
EIP 155
EIPManagerClass 449
EIPManagerClass Concepts 449
EIPManagerClass Source Files 450
EIPManagerClass--ABC Template Implementation 450
EIPManagerClass--Conceptual Example 451
EIPManagerClass--Functional Organization--Expected Use 461
EIPManagerClass--Overview 449
EIPManagerClass--Relationship to Other Application Builder Classes 449
EndReport 1047
Enter 455
Enter (edit-in-place action on enter key) 455
EnterAction 156
BrowseClass 156
EnterAction (edit-in-place action on enter key) 156
Entries 1129
StepCustomClass 1129
Entries (expected data distribution) 1129
EntryCompletion 569
FileDropComboClass 569
EntryCompletion (automatic fill-ahead flag) 569
EntryLocatorClass
methods 482
properties 481
EntryLocatorClass Methods 482
EntryLocatorClass Overview 477
EntryLocatorClass Properties 481
EQ 455
Equal 559
FieldPairsClass 559
Equal (return 1 if all pairs are equal) 559
Equal(checks for equal before and after values) 329
EqualBuffer 628
FileManagerClass 628
EqualBuffer (detect record buffer changes) 628
EqualLeftBuffer 244
BufferedPairsClass 244
EqualLeftBuffer (compare "left" fields to "buffer" fields) 244
EqualLeftRight 560
FieldPairsClass 560
EqualLeftRight (return 1 if all pairs are equal) 560
EqualRightBuffer 245
BufferedPairsClass 245
EqualRightBuffer (compare "right" fields to "buffer" fields) 245
Err (errorclass object) 836
Err (errorclass obejct) 777
ErrorClass
methods 502, 503
properties 496

ErrorClass Functional Organization--
Expected Use 502
ErrorClass Overview 489
ErrorClass Properties 496
ErrorClass Source Files 835
ErrorLog (errorlog interface) 497
ErrorLogInterface Concepts 543
ErrorLogInterface Methods 544
ErrorLogInterface Source Files 543
ErrorMgr 64
ASCIIFileClass 64
ErrorMgr (ErrorClass object) 64
Errors 497, 1347
ErrorClass 497
WindowManagerClass 1347
Errors (ErrorClass object) 315, 1347
Errors (recognized error definitions) 497
eShowSBonFirstThread 722
eSumYMax 722
ExtractText 1264
TranslatorClass 1264
ExtractText (identify text to translate) ... 1264
FEQ 346
EditClass 343
FEQ (the edit-in-place control number) ... 343
Fetch 184, 629, 801, 802
BrowseClass 184
FileManagerClass 629
INIClass 802
Fetch (get a page of browse items) 184
Fetch (get a specific record by key value)
..... 629
Fetch (get INI file entries) 801
FetchFeq (retrieve button feq) 838
FetchField 803
INIClass 803
FetchField (return comma delimited INI file
value) 803
FetchQueue 804
INIClass 804
FetchQueue (get INI file queue entries) .. 804
FetchRecord (retrieve selected record) .. 770
FetchStdButton (determine button pressed)
..... 838
FieldName 498
FieldPairsClass 547, 548, 549
properties 550
FieldPairsClass Functional Organization--
Expected Use 551
FieldPairsClass Overview 547
FieldPairsClass Properties 550
Fields 456
Fields (managed fields) 456
FILE 608
File Manager 601
FileDropClass
methods 589
properties 588
FileDropClass Functional Organization--
Expected Use 589
FileDropClass Methods 589
FileDropClass Overview 583
FileDropClass Properties 588
FileDropComboClass
methods 571
Overview 563
properties 568
FileDropComboClass Functional
Organization--Expected Use 571
FileDropComboClass Methods 571
FileDropComboClass Properties 568
FileManager
methods 613
properties 606
FileManager Functional Organization--
Expected Use 614
FileManager Overview 601
FileManager Properties 606
FileManagerClass
Database Operations 613
Interactive Database Operations 613
Silent Database Operations 613
FileMask
EditFileClass 411
FileMgr 82, 91
AsciiPrintClass 82
ASCIISearchClass 91
FileName 498, 609
FileManagerClass 609
INIClass 800
FileName (variable filename) 609
FileNameValue 610
FileManagerClass 610
FileNameValue (constant filename) 610

FilesOpened(files opened by procedure) 1347
FilterLocatorClass
methods 696
properties 695
FilterLocatorClass Methods 696
FilterLocatorClass Overview 691
FilterLocatorClass Properties 695
FilterReset 829
Find 90
ASCIISearchClass 90
Find (search constraints) 90
FindNearbyNodes 743
Finish 1248
FirstField
WindowManagerClass 1347
FIRSTFIELD 1347
FirstField (first window control) 1347
Flags 1101
SelectFileClass 1101
Flags (file dialog behavior) 1101
FlatButtons (use flat button style) 296
FldsEIP 984
FldsEIP (reference to the EditDropListClass) 984
FloatRight 695
FilterLocatorClass 695
FloatRight ("contains" or "begins with" flag) 695
FocusLoss 456
FocusLoss (action on loss of focus) 456
FocusLossAction 157
BrowseClass 157
FocusLossAction (edit-in-place action on lose focus) 157
Font (apply font attributes) 297
ForcedReset
WindowManagerClass 1348
ForcedReset (force reset flag) 1348
ForceRefresh 1348
FormatLine 66
ASCIIFileClass 66
FormatLine (a virtual to format text) 66
FreeElement 825
LocatorClass 825
FreeElement (the locator's first free key element) 825
Functional Organization--Expected Use . 344
FuzzyClass ABC Template Implementation 699
FuzzyClass Source Files 699
FuzzyClassClass Properties 700
GetAcross (number of horizontal grids) .. 771
GetButtonFeq(returns a field equate label) 960
GetCategory (retrieve error category) 505
GetClickPress (forward click control) 771
GetComponents 630
FileManagerClass 630
GetComponents (return the number of key components) 630
GetControl(returns control number) 786
GetDefaultCategory 505
GetDOSFilename 67
ASCIIFileClass 67
GetDOSFilename (let end user select file) 67
GetDown (number of vertical grids) 771
GetEdit 465
GetEdit (identify edit-in-place field) 465
GetEOF 631
FileManagerClass 631
GetEOF (return end of file status) 631
GetError 506, 632
ErrorClass 506
FileManagerClass 632
GetError (return the current error ID) 632
GetErrorcode 506
ErrorClass 506
GetField 633
FileManagerClass 633
GetField (return a reference to a key component) 633
GetFieldName 506, 635
FileManagerClass 635
GetFieldName (return a key component field name) 635
GetFieldPicture(get field picture) 637
GetFields(get number of fields) 637
GetFieldType(get field type) 637
GetFilename 68
ASCIIFileClass 68
GetFileName 507
GetFilename (return the filename) 68
GetFirstSortField 1291

GetFreeElementName 1292
ViewManagerClass..... 1292
GetFreeElementName (return free key element name)..... 1292
GetFreeElementPosition 1293
ViewManagerClass..... 1293
GetFreeElementPosition (return free key element position) 1293
GetHelpFile (get help file name) 1173
GetHistoryResetOnView 507
GetHistoryThreshold 508
GetHistoryViewLevel..... 508
GetItemChecked 856
PopupClass 856
GetItemChecked (return toggle item status) 856
GetItemEnabled 857
PopupClass 857
GetItemEnabled (return item status)..... 857
GetItems..... 858
GetItems(returns number of entries)..... 786
GetKeyName..... 509
GetLastLineNo 69
ASCIIFileClass 69
GetLastLineNo (return last line number)... 69
GetLastSelection..... 859
PopupClass 859
GetLastSelection (return selected item).. 859
GetLimit
QueryClass..... 932
GetLimit (get searchvalues) 932
GetLine..... 70
ASCIIFileClass 70
GetLine (return line of text) 70
GetLogErrors..... 509
GetMessageText..... 510
GetMouse..... 744
GetName..... 638
FileManagerClass..... 638
GetName (return the filename) 638
GetNbFiles(returns number of children) 1019
GetNbRelations(returns number of relations) 1019
GetParentControl 1321
WindowResizeClass..... 1321
GetParentControl (return parent control) 1321
GetPercentile.....71, 1118, 1131, 1139, 1153
ASCIIFileClass..... 71
StepClass..... 1118
StepCustomClass 1131
StepLongClass 1139
StepRealClass 1153
StepStringClass 1165
GetPercentile (convert file position to percentage)..... 71
GetPercentile (return a value's percentile) 1118, 1131, 1139, 1153, 1165
GetPosition (retrieve group control position) 772
GetPositionStrategy 1322
WindowResizeClass 1322
GetPositionStrategy (return position strategy for a control type)..... 1322
GetProcedureName 510
GetProcedureName (return procedure name) 510
GetQueueMatch 574
FileDropComboClass..... 574
GetQueueMatch (locate a list item)..... 574
GetRelation(returns reference to relation manager)..... 1020
GetRelationType(returns relation type) . 1020
GetResizeStrategy 1323
WindowResizeClass 1323
GetResizeStrategy (return resize strategy for a control type)..... 1323
GetShadow(return shadow value)... 482, 827
GetSilent..... 511
GetText (copy text to variable) 298
GetTopic (get current topic name)..... 1173
GetValue.....1119, 1132, 1140, 1154
StepClass..... 1119
StepCustomClass 1132
StepLongClass 1140
StepRealClass 1154
StepStringClass 1166
GetValue (return a percentile's value).. 1119, 1132, 1140, 1154, 1166
GetValueFromField 745
GetValueFromStatusBar 745
GetVisible(returns visibility of control) 786
GraphClass Overview 721
GraphClass Source Files 721

GridClass ABC Template Implementation 765
GridClass Methods 770
GridClass Overview 765
GridClass Properties 766
GridClass Source Files 765
GroupColor (background color of group fields) 768
GroupControl (GROUP control number) . 768
GroupTitle (title of group element) 768
gShowDiagramName 723
gShowDiagramNameV 724
gShowMouse 725
gShowMouseX 726
gShowMouseY 727
gShowNodeName 728
gShowNodeNameV 729
gShowNodeValue 730
gShowNodeValueX 731
gShowNodeValueY 732
HasCancelButton display cancel button on report preview 269
HasCloseButton display close button on report preview 270
HasExportButton display export button on report preview 271
HasLaunchButton display launch button on report preview 272
HasNavigationControls display navigation controls on report preview 273
HasPrintButton display print button on report preview 274
HasPrintSetupButton display print setup button on report preview 275
HasProgressControls display progress controls on report preview 276
HasRefreshButton display refresh button on report preview 277
HasSearchButton display search button on report preview 278
HasThumb 158
BrowseClass 158
HasZoomControl display zoom control on report preview 279
HelpButton 1218
ToolbarTargetClass 1218
HelpButton (help control number) 1218
HideSelect 158
High 1138, 1152
StepLongClass 1138
StepRealClass 1152
High (upper boundary) 1138, 1152
HistHandlerClass Methods 779
HistHandlerClass Properties 777
HistHandlerClass Source Files 777
History 1237
ToolbarUpdateClass 1237
History (enable toolbar history button) .. 1237
History (error history structure) 777
HistoryHandler (windowcomponent interface) 837
HistoryKey 1348
WindowManagerClass 1348
HistoryKey (restore field key) 1348
HistoryMsg (initialize the message window) 511
hRTFWindow(RTF control handle) 291
Icon (icon for image control) 836
IDbChangeAudit Concepts 781
IDbChangeAudit Methods 781
IDbChangeAudit Source Files 781
IfGroupField (determine if current control is a GROUP) 772
IListControl Concepts 785
IListControl Methods 785
IListControl Source Files 785
ImageToWMF 746
IncrementalLocatorClass
methods 794
properties 793
IncrementalLocatorClass Methods 794
IncrementalLocatorClass Overview 789
IncrementalLocatorClass Properties 793
INIClass 797, 798, 799
methods 801
properties 800
INIClass Methods 801
INIClass Properties 800
Init 72, 84, 93, 107, 108, 140, 185, 246, 257, 466, 483, 512, 560, 575, 576, 593, 639, 640, 746, 805, 828, 860, 890, 911, 977, 987, 999, 1021, 1048, 1104, 1120, 1133, 1193, 1267, 1294, 1324, 1366
ASCIIFileClass 72

ASCIIPrintClass 84
ASCIISearchClass 93
ASCIIViewerClass 107, 108
BrowseClass 185
BufferedPairsClass 246
ConstantClass 257
EditClass 346
EntryLocatorClass 483
ErrorClass 512
FieldPairsClass 560
FileDropClass 593
FileDropComboClass 575
INIClass 805, 806
LocatorClass 828
PopupClass 860
PrintPreviewClass 890
ProcessClass 911, 912
QueryClass 933
QueryFormClass 951
QueryFormVisual 961
SelectFileClass 1104
StepClass 1120
StepCustomClass 1133
StepStringClass 1167
ToolbarClass 1193
TranslatorClass 1267
ViewManagerClass 1294
WindowManagerClass 1366
WindowResizeClass 1324
Init (initalize TextWindow object) 1181
Init (initialize FuzzyClass object) 700
Init (initialize HTML Help object) 1174
Init (initialize the ASCIIPrintClass object) .. 84
Init (initialize the ASCIISearchClass object) 93
Init (initialize the ASCIIViewerClass object) 107
Init (initialize the BrowseClass object) 185
Init (initialize the BrowseEIPManagerClass object) 140
Init (initialize the BrowseToolbarClass object) 228
Init (initialize the BufferedPairsClass object) 246
Init (initialize the ConstantClass object) .. 257
Init (initialize the cwRTF object) 299
Init (initialize the DbAuditManager object) 319
Init (initialize the DbChangeManager object) 329
Init (initialize the DbLogFileManager object) 335
Init (initialize the EditClass object) 346
Init (initialize the EntryLocatorClass object) 483
Init (initialize the ErrorClass object) 512
Init (initialize the FieldPairsClass object) . 560
Init (initialize the FileDropClass object) ... 593
Init (initialize the FileDropComboClass object) 575
Init (initialize the GridClass object) 773
Init (initialize the HistHandlerClass object) 779
Init (initialize the INIClass object) 805
Init (initialize the LocatorClass object) 828
Init (initialize the MsgBoxClass object) 839
Init (initialize the PopupClass object) 860
Init (initialize the PrintPreviewClass object) 890
Init (initialize the QueryClass object) 933
Init (initialize the QueryFormClass object) 951
Init (initialize the QueryFormVisual object) 961
Init (initialize the QueryListClass object) . 977
Init (initialize the QueryListVisual object) 987
Init (initialize the QueryVisual object) 999
Init (initialize the SelectFileClass object) 1104
Init (initialize the StepClass object) 1120
Init (initialize the StepCustomClass object) 1133
Init (initialize the ToolbarClass object) .. 1193
Init (initialize the TranslatorClass object) 1267
Init (initialize the ViewManager object) .. 1294
Init (initialize the WindowManager object) 1366
Init (initialize the WindowResizeClass object) 1324
Init initialize Crystal8 object 280
Init(initialize the StandardBehavior object) 1109

InitBrowse (initialize the BrowseToolbarClass update buttons) . 228
InitControls 466
InitMisc (initialize the BrowseToolbarClass miscellaneous buttons) 229
InitSort (initialize locator values) 186
InitSyncPair 588
InitVCR (initialize the BrowseToolbarClass VCR buttons) 230
InPageList 891
Insert 457, 641
FileManagerClass 641
Insert (add a new record) 641
Insert (placement of new record) 457
Insert(add entry to LIST queue) 223
InsertAction 1349
WindowManagerClass 1349
InsertAction (response to insert request) 1349
InsertButton 1219
ToolbarTargetClass 1219
InsertButton (insert control number) 1219
InsertControl 159
BrowseClass 159
InsertRecord 1368
Interactive Database Operations
FileManagerClass 613
Interactivity 747
IsDirty (indicates modified data) 300
IsOverNode 747
IsSkelActive 773
KeepVisible 1036
KeyToOrder 642
FileManagerClass 642
KeyToOrder (return ORDER expression for a key) 642
KeyValid (check for valid keystroke) 577
KeyWordLookup (lookup keyword) 1175
Kill 73, 109, 110, 141, 187, 247, 259, 467, 513, 561, 594, 644, 748, 860, 892, 913, 978, 1000, 1022, 1049, 1121, 1134, 1168, 1193, 1267, 1295, 1327, 1369
ASCIIViewerClass 109
BrowseClass 187
BufferedPairsClass 247
ConstantClass 259
EditClass 347
ErrorClass 513
FieldPairsClass 561
FileDropClass 594
FileManagerClass 644
PopupClass 860
PrintPreviewClass 892
ProcessClass 913
QueryClass 934
QueryFormClass 952
RelationManagerClass 1022
ReportManagerClass 1049
StepClass 1121
StepCustomClass 1134
StepStringClass 1168
ToolbarClass 1193
TranslatorClass 1267
WindowManagerClass 1369
WindowResizeClass 1327
Kill (perform any necessary termination code) 513, 839
Kill (shut down DbAuditManger object) ... 319
Kill (shut down DbChangeManger object) 330
Kill (shut down the ASCIIFileClass object) 73
Kill (shut down the ASCIIViewerClass object) 109
Kill (shut down the BrowseClass object) . 187
Kill (shut down the BrowseEIPManagerClass object) 141
Kill (shut down the BufferedPairsClass object) 247
Kill (shut down the ConstantClass object) 259
Kill (shut down the csRTF object) 301
Kill (shut down the EIPManagerClass object) .....
Kill (shut down the FieldPairsClass object) 561
Kill (shut down the FileDropClass object) 594
Kill (shut down the PopupClass object) ... 860
Kill (shut down the PrintPreviewClass object) 892
Kill (shut down the ProcessClass object) 913
Kill (shut down the QueryClass object) ... 934
Kill (shut down the QueryFormClass object) 952
Kill (shut down the QueryListClass object) 978

Kill (shut down the QueryVisual object) 1000
Kill (shut down the RelationManager object) 1022
Kill (shut down the ReportManager object) 1049
Kill (shut down the StepClass object) ... 1121
Kill (shut down the StepCustomClass object) 1134
Kill (shut down the StepStringClass object) 1168
Kill (shut down the ToolbarClass object) 1193
Kill (shut down the TranslatorClass object) 1267
Kill (shut down the WindowManager object) 1369
Kill (shut down the WindowResizeClass object) 1327
Kill (shutdown FuzzyClass object) 700
Kill (shutdown TextWindow object) 1181
Kill (shutdown the FileManager object) ... 644
Kill (shutdown the GridClass object) 774
Kill (shutdown the QueryListVisual object) 988
Kill (shutdown the TagHTMLHelp object) 1175
Kill shut down Crystal8 object 281
Kill(shutdown the parent object) 1308
LastColumn 458
LastColumn (previous edit-in-place column) 458
LastInsertedPosition 1349
  WindowManager 1349
LazyOpen 611
  FileManagerClass 611
LazyOpen (delay file open until access) . 611
LBColumns (number of listbox columns) 778
LeftIndent (indent the current or selected paragraph) 301
Level 491
  Benign 491
  Cancel 491
  Fatal 491
  Notify 491
  Program 491
  User 491
LFM (DbLogFileManager object) 315
LimitTextSize (limit amount of text) 302
LineCounter 91
  ASCIISearchClass 91
List
  FieldPairsClass 550
LIST 550
List (recognized field pairs) 550
ListControl 458
ListControl (listbox control number) 458
ListLinkingFields 1023
  RelationManagerClass 1023
ListLinkingFields (map pairs of linked fields) 1023
ListQueue 159
  BrowseClass 159
Load 260
  ConstantClass 260
Loaded 159
  BrowseClass 159
Loaded (browse queue loaded flag) 159
LoadField (load rich text data from field) . 302
LocateButton(query control number) 1219
LocatorClass 691, 823, 824
  methods 827
  properties 825
LocatorClass Methods 827
LocatorClass Overview 823
LocatorClass Properties 825
LockRecover 611
  FileManagerClass 611
LockRecover (/RECOVER wait time parameter) 611
LogErrors 500
LookupMode 1162
  StepStringClass 1162
Low 1138, 1152
  StepLongClass 1138
  StepRealClass 1152
Low (lower boundary) 1138, 1152
Match (find query matches) 701
Maximize
  PrintPreviewClass 879
MAXIMIZE 879
Maximize (number of pages displayed horizontally) 879
Me 1010
  RelationManagerClass 1010

Me (the primary file's FileManager object) 1010
Message
ErrorClass 514
MESSAGE 514
MessageBox 516
ErrorClass 516
MessageBox (display error message to window) 516
MessageText 500
MouseText 748
MouseXText 748
MouseYText 749
Msg 515
ErrorClass 515
Msg (initiate error message destination) 515
MsgBoxClass Methods 838
MsgBoxClass Overview 835
MsgBoxClass Properties 836
MsgRVal (message box return value) 837
MyWindow 1350
NameQueue (pointer into trigger queue) 326
Naming Conventions and Dual Approach to Database Operations 613
Next
ASCIISearchClass 94
BrowseClass 188
ConstantClass 262
FileManagerClass 645
ProcessClass 914
ReportManagerClass 1050
NEXT 94, 188, 262, 468, 645, 914, 1050, 1295
Next (copy next constant item to targets) 262
Next (find next line containing search text) 94
Next (get next element) 914
Next (get next record in sequence) 645
Next (get next report record) 1050
Next (get the next browse item) 188
Next (get the next edit-in-place field) 468
Next (load all constant items to file or queue) 262
NoCase
LocatorClass 826
NOCASE 826
NoCase (case sensitivity flag) 826
NodeNameText 749
NodeText 750
NodeTipText 750
NodeValueText 751
NodeXText 751
NodeYText 752
OKControl 1350
WindowManagerClass 1350
OKControl (window acceptance control--OK button) 1350
OnChange (update audit log file after a record change) 320, 783
OnDelete (update audit log file when a record is deleted) 320
OnFieldChange (virtual method for each field change) 321
OnInsert (update audit log file when a record is added) 322
Open 1370
FileManagerClass 646
PrintPreviewClass 893
RelationManagerClass 1024
ViewManagerClass 1296
OPEN 646, 893, 1024, 1051, 1296
Open (initiate open of log file) 545
Open (open a file and any related files) 1024
Open (open standarderrorlog file) 1114
Open (open the file) 646
Open (open the view) 1296
Open (prepare preview window for display) 893
Opened 1350
WindowManagerClass 1350
Opened (file opened flag) 334, 814
Opened (window opened flag) 1350
OpenLogFile (open the audit log file) 322
OpenMode 612
FileManagerClass 612
OpenMode (file access/sharing mode) 612
OpenReport 1052, 1053
ReportManagerClass 1052
OpenReport (prepare report for execution) 1052
OpsEIP 984
OpsEIP (reference to the EditDropListClass) 984
Order
ViewManagerClass 1278
ORDER 1278

Order (sort
range-limit
and filter information) 1278
OriginalRequest 1351
WindowManagerClass..... 1351
OriginalRequest (original database request)
..... 1351
OutputFileQueue..... 1036
Overview 313, 699
OwnerWindow..... 1351
PageDown..... 111
ASCIIViewerClass 111
PageDown (scroll down one page)..... 111
PagesAcross 879
PrintPreviewClass 879
PagesAcross (number of pages displayed
horizontally) 879
PagesAhead..... 1279
ViewManagerClass..... 1279
PagesAhead (buffered pages) 1279
PagesBehind..... 1279
ViewManagerClass..... 1279
PagesBehind (buffered pages) 1279
PagesDown..... 880
PrintPreviewClass 880
PagesDown (number of vertical thumbnails)
..... 880
PageSize..... 1280
ViewManagerClass..... 1280
PageSize (buffer page size)..... 1280
PagesToPrint..... 880
PageUp 112
ASCIIViewerClass 112
PageUp (scroll up one page) 112
Paste (paste text from clipboard) 305
Percentile 907
ProcessClass..... 907
Percentile (portion of process completed)
..... 907
Popup..... 752
ASCIIViewerClass 100
BrowseClass..... 160
POPUP..... 100, 160
PopupAsk..... 753
PopupClass..... 841, 842, 843
methods..... 846
properties..... 845
PopupClass Functional Organization--
Expected Use 846
PopupClass Methods 846
PopupClass Overview..... 841
PopupClass Properties..... 845
Position
FileManagerClass..... 647
POSITION 647
Position (return the current record position)
..... 647
PostCompleted..... 1372
WindowManagerClass..... 1372
PostCompleted (initiates final Window
processing) 1372
PostEvent..... 754
PostNewSelection 190
BrowseClass..... 190
PostNewSelection (post an EVENT
NewSelection to the browse list)..... 190
Preview
ReportManagerClass..... 1037
PREVIEW..... 1037
Preview (PrintPreviewClass object) 1037
Preview preview a Crystal Report 282
PreviewQueue..... 1037
ReportManagerClass..... 1037
PreviewQueue (report metafile pathnames)
..... 1037
Previous
BrowseClass..... 191
FileManagerClass..... 656
ViewManagerClass..... 1297
PREVIOUS..... 191, 656, 1297
Previous (get previous record in sequence)
..... 656
Previous (get the previous browse item). 191
Previous (get the previous element) 1297
Primary
ViewManagerClass..... 1280
WindowManagerClass..... 1351
PRIMARY 1280, 1351
Primary (RelationManager object)..... 1351
Primary (the primary file RelationManager)
..... 1280
PrimeAutoInc..... 657, 658
FileManagerClass..... 657

PrimeAutoInc (prepare an autoincremented record for adding) 657
PrimeFields 659, 1373
FileManagerClass 659
WindowManagerClass 1373
PrimeFields (a virtual to prime fields) 659
PrimeFields (a virtual to prime form fields) 1373
PrimeRecord 660, 1298
FileManagerClass 660
ViewManagerClass 1298
PrimeRecord (prepare a record for adding) 660, 1298
PrimeUpdate 1374
WindowManagerClass 1374
PrimeUpdate (update or prepare for update) 1374
Printer
ASCIIViewerClass 100
PRINTER 100
PrintGraph 756
PrintLines 85
ASCIIPrintClass 85
PrintLines (print or preview specified lines) 85
PrintPreview 82
AsciiPrintClass 82
PrintPreviewClass 873, 874, 875, 876, 1029
methods 883
properties 878
PrintPreviewClass Functional Organization--Expected Use 883
PrintPreviewClass Methods 883
PrintPreviewClass Overview 873
PrintPreviewClass Properties 878
PrintReport 1053
Process 1038, 1249
ReportManagerClass 1038
Process (ProcessClass object) 1038
ProcessArc 815
ProcessChord 817
ProcessClass
methods 909
properties 907
ProcessClass Functional Organization--Expected Use 909
ProcessClass Methods 909
ProcessClass Overview 903
ProcessClass Properties 907
ProcessResultFiles 1054
PText 908
ProcessClass 908
PText (progress control number) 908
QC 998
QC (reference to the QueryClass) 998
QFC 984
QueryFromVisual 958
QFC (reference to the QueryFormClass) 958
QFC (reference to the QueryListClass) ... 984
QKCurrentQuery 922
QKCurrentQuery (popup menu choice) 922
QKIcon 922
QKIcon (icon for popup submenu) 922
QKMenuIcon 922
QKMenuIcon (icon for popup menu) 922
QKSupport 923
QKSupport (quickqbe flag) 923
Query retrieve or set the SQL data query 284
QueryClass 917
AddItem 925
Ask 927
GetFilter 930
GetLimit 932
Init 933
Kill 934
methods 924
properties 922
Reset 935
SetLimit 938
QueryClass ABC Template Implementation 918
QueryClass Concepts 917
QueryClass Conceptual Example 919
QueryClass Functional Organization--Expected Use 924
QueryClass Methods 924
QueryClass Overview 917
QueryClass Properties 922
QueryClass Relationship to Other Application Builder Classes 917
QueryClass Source Files 918
QueryControl (query button) 1038
QueryFormClass 943
Ask 950

Init 951
Kill 952
methods 949
properties 948
QueryFormClass ABC Template Implementation 944
QueryFormClass Concepts 943
QueryFormClass Conceptual Example ... 945
QueryFormClass Functional Organization--Expected Use 949
QueryFormClass Methods 949
QueryFormClass Overview 943
QueryFormClass Properties 948
QueryFormClass Relationship to Other Application Builder Classes 943
QueryFormClass Source Files 944
QueryFormVisual 953
Init 961
QFC 958
TakeAccepted 964
TakeCompleted 965
QueryFormVisual ABC Template Implementation 953
QueryFormVisual Concepts 953
QueryFormVisual Conceptual Example .. 955
QueryFormVisual Functional Organization--Expected Use 959
QueryFormVisual Overview 953
QueryFormVisual Relationship to Other Application Builder Classes 953
QueryFormVisual Source Files 954
QueryListClass 969
QueryListClass Concepts 969
QueryListClass Methods 975
QueryListClass Properties 974
QueryListClass Source Files 970
QueryListClass--Conceptual Example 971
QueryListClass--Functional Organization--Expected Use 975
QueryListClass--Overview 969
QueryListClass--Relationship to Other Application Builder Classes 969
QueryListVisual 979
QueryListVisual Concepts 979
QueryListVisual Methods 986
QueryListVisual Properties 984
QueryListVisual Source Files 979
QueryListVisual--ABC Template Implementation 979
QueryListVisual--Conceptual Example ... 981
QueryListVisual--Functional Organization--Expected Use 986
QueryListVisual--Overview 979
QueryListVisual--Relationship to Other Application Builder Classes 979
QueryVisualClass Overview 997
QueryVisualClass Methods 999
QueryVisualClass Properties 998
QuickScan 163
BrowseClass 163
READONLY 343
ReadOnly (edit-in-place control is read-only) 343
RealList 235
BufferedPairsClass 235
RealList (recognized field pairs) 235
RECORDS 192
Records(return number of records) 223
RecordsProcessed 908
ProcessClass 908
RecordsProcessed (number of elements processed) 908
RecordsToProcess 908
ProcessClass 908
RecordsToProcess (number of elements to process) 908
Redo (reapply action) 306
referential integrity enforcement of 1005
Refresh 757
refresh/redisplay ABC BrowseBoxes 172
RelationManager 1005, 1006, 1007
properties 1010
RelationManager Functional Organization--Expected Use 1011
RelationManager Overview 1005
RelationManager Properties 1010
Relationship to Other Application Builder Classes 221, 225, 313, 325, 333, 337, 377, 543, 699, 765, 781, 785, 1107, 1171, 1179, 1307
RemoveDuplicatesFlag (remove duplicate data) 569
RemoveErrors 517

ErrorClass 517
RemoveErrors (remove or restore recognized errors) 517
RemoveItem(remove WindowComponent object) 1375
Replace (find and replace search) 306
Report
ReportManagerClass 1039
REPORT 1039
Report (the managed REPORT) 1039
ReportManager Concepts 1029
ReportManager Functional Organization--Expected Use 1043
ReportManager Methods 1043
ReportManager Overview 1029
ReportManager Properties 1034
ReportManagerClass
methods 1043
properties 1034
ReportTarget 1039
Repost 459
Repost (event synchronization) 459
RepostField 459
RepostField (event synchronization field) 459
REQ 460
Req (database request) 460
Request 1236, 1353
ToolbarUpdateClass 1236
WindowManagerClass 1353
Request (database request) 1353
Request (requested database operation) 1236
Reset 1250
ASCIIFileClass 74
ASCIIViewerClass 113
ConstantClass 263
EditMultiSelectClass 438
FilterLocatorClass 829
QueryClass 935
ViewManagerClass 1299
WindowManagerClass 1376
WindowResizeClass 1328
RESET 74, 113, 263, 915, 1001, 1299, 1328, 1376
Reset (reset the dialog for display QueryVisualClass) 1001
Reset (reset the ASCIIFileClass object) ... 74
Reset (reset the ASCIIViewerClass object) 113
Reset (reset the locator for next search) . 829
Reset (reset the object to the beginning of the constant data) 263
Reset (reset the QueryClass object) 935
Reset (reset the view position) 1299
Reset (reset the window for display) 1376
Reset (resets the WindowResizeClass object) 1328
reset ABC BrowseBoxes 172
Reset(reset object's data) 1311
ResetButton (synchronize a toolbar control with a corresponding browse control) .. 231
ResetColumn 469
ResetColumn (reset edit-in-place object to selected field) 469
ResetFromAsk 193
BrowseClass 193, 194
ResetFromAsk (reset browse after update) 193
ResetFromBrowse(synchronize toolbar controls with browse controls) 232
ResetFromBuffer 195
BrowseClass 195
ResetFromBuffer (fill queue starting from record buffer) 195
ResetFromFile 196
BrowseClass 196
ResetFromFile (fill queue starting from file POSITION) 196
ResetFromQuery 962, 989
ResetFromQuery (reset the QueryFormVisual object) 962
ResetFromQuery (reset the QueryList Visual object) 989
ResetFromView 197
BrowseClass 197
ResetFromView (reset browse from current result set) 197
ResetHistory(clear History structure) 518
ResetOnGainFocus 1354
WindowManagerClass 1354
ResetOnGainFocus (gain focus reset flag) 1354
ResetQueue 198, 578, 595
BrowseClass 198

FileDropClass 595
FileDropComboClass 578
ResetQueue (fill filedrop queue) 595
ResetQueue (fill or refill queue) 198
ResetQueue (refill the filedrop queue) 578
ResetRequired(determine if screen refresh needed)..... 1312
ResetResets..... 199
BrowseClass..... 199
ResetResets (copy the Reset fields)..... 199
ResetSort 200
BrowseClass..... 200
ResetSort (apply sort order to browse) ... 200
Resize 757
WindowResizeClass..... 1329
RESIZE 1329
Resize (resize and reposition controls). 1329
Resize (WindowResize object) 1354
ResizeControls (used internally) 306
Resizer 998
Resizer (reference to the WindowResizeClass QueryVisualClass) 998
Response 1355
WindowManagerClass..... 1355
Response (response to database request) 1355
Restore..... 861, 936
PopupClass 861
Restore (retrieve saved query)..... 936
Restore (restore a saved menu) 861
RestoreBuffer 662
RestoreBuffers 1300
RestoreField..... 1377
WindowManagerClass..... 1377
RestoreField (restore field to last saved value)..... 1377
RestoreFile..... 663
FileManagerClass..... 663
RestoreFile (restore a previously saved file state)..... 663
RestoreLogout..... 1251
RestoreWindow..... 1330
WindowResizeClass..... 1330
RestoreWindow (restore window to initial size) 1330
RetainRow..... 164
BrowseClass..... 164
ReturnFromDrillDown..... 758
RightIndent (indent the current or selected paragraph) 307
Root 1163
StepStringClass 1163
Root (the static portion of the step) 1163
Run 1252
WindowManagerClass..... 1378
RUN..... 470, 1378, 1379
Run (run the EIPManager) 470
Run (run this procedure or a subordinate procedure)..... 1378
Save 862, 937, 1024
PopupClass..... 862
RelationManagerClass 1024
Save (save a query) 937
Save (copy the current record and any related records)..... 1024
Save (save a menu for restoration)..... 862
SaveAsGraph 759
SaveBuffer..... 664
FileManagerClass..... 664
SaveBuffer (save a copy of the record buffer)..... 664
SaveBuffers..... 1281, 1300
Saved 1355
WindowManagerClass..... 1355
Saved (copy of primary file record buffer) 1355
SaveField (save rich text data to field) 307
SaveFile..... 665
FileManagerClass..... 665
SaveFile (save rich text data to file) 308
SaveFile (save the current file state)..... 665
SaveGraph 759
SaveHistory 1380
WindowManagerClass..... 1380
SaveHistory (save history fields for later restoration)..... 1380
SaveOnChangeAction..... 1381
SaveOnInsertAction 1382
ScrollEnd 201
BrowseClass..... 201
ScrollEnd (scroll to first or last item)..... 201
ScrollOne..... 202
BrowseClass..... 202

ScrollOne (scroll up or down one item) ... 202
ScrollPage ... 203
  BrowseClass ... 203
ScrollPage (scroll up or down one page) 203
Searcher ... 101
  ASCIIViewerClass ... 101
SeekForward ... 460
SeekForward (get next field flag) ... 460
SelColor (color of selected element) ... 769
SelE (ending edit position) ... 1180
Selectable (element selectable flag) ... 769
SelectButton ... 1220
  ToolbarTargetClass ... 1220
SelectButton (select control number) ... 1220
SelectControl ... 164
  BrowseClass ... 164
SelectFileClass
  properties ... 1100
SelectFileClass Overview ... 1097
SelectFileClass Properties ... 1100
Selecting ... 165
  BrowseClass ... 165
SelectionFormula retireve or set the Crystal
  formula ... 285
SelectText (select characters) ... 308
SelectWholeRecord ... 165
SelS (starting edit position) ... 1180
Set
  ConstantClass ... 264
  EntryLocatorClass ... 484
  LocatorClass ... 830
  StepLocatorClass ... 1147
SET ... 264, 484, 830, 1147
Set (restart the locator) ... 484, 830, 1147
Set (set the constant data to process) ... 264
SetAlerts ... 204, 794, 830, 990, 1383
  BrowseClass ... 204
  EditClass ... 347, 393
  IncrementalLocatorClass ... 794
  LocatorClass ... 830
  WindowManagerClass ... 1383
SetAlerts (alert keystrokes for list and
  locator controls) ... 204
SetAlerts (alert keystrokes for the edit
  control
  QueryListVisual) ... 990
SetAlerts (alert keystrokes for the edit
  control) ... 393
SetAlerts (alert keystrokes for the LIST
  control) ... 794, 830
SetAlerts (alert window control keystrokes)
  ... 1383
SetAlerts (initialize and create child controls)
  ... 774
SetAlerts(alert keystrokes for window
  component) ... 1313
SetAlias ... 1025
  RelationManagerClass ... 1025
SetAlias (set a file alias) ... 1025
SetCategory (set error category) ... 518
SetChoice(change selected entry) ... 787
SetControl(change selected entry) ... 787
SetDefault ... 760
SetDefaultCategory ... 518
SetDefaultPages ... 897
SetDirtyFlag (set modified flag) ... 309
SetDynamicControlsAttributes ... 1056
SetEnabled ... 831
  LocatorClass ... 831
SetEnabled (enable or disable the locator
  control) ... 831
SetError ... 666
  FileManagerClass ... 666
SetError (save the specified error and
  underlying error state) ... 666
SetErrors ... 519, 667
  ErrorClass ... 519
SetErrors (save the error state) ... 519
SetFatality ... 520
  ErrorClass ... 520
SetFatality (set severity level for a particular
  error) ... 520
SetField ... 521
  ErrorClass ... 521
SetField (set the substitution value of the
  %Field macro) ... 521
SetFieldName ... 521
SetFile ... 522
  ErrorClass ... 522
SetFile (set the substitution value of the
  %File macro) ... 522
SetFileName ... 522
SetFilter ... 1301

SetFM (determine log file status) 323
SetFocus (give rich text control focus) 309
SetHelpFile (set the current HTML Help file name) 1176
SetHistoryResetOnView 523
SetHistoryThreshold 523
SetHistoryViewLevel 524
SetId 527
ErrorClass 527
SetId (make a specific error current) 527
SetINIManager 894
PrintPreviewClass 894
SetINIManager (save and restore window coordinates) 894
SetItemCheck 864
PopupClass 864
SetItemCheck (set toggle item status) 864
SetItemEnable 865
PopupClass 865
SetItemEnable (set item status) 865
SetKey 668
FileManagerClass 668
SetKey (set current key) 668
SetKeyName 526
SetLevel 866
PopupClass 866
SetLevel (set menu item level) 866
SetLimit 1122, 1141, 1155, 1169
QueryClass 938, 939
StepClass 1122
StepLongClass 1141
StepRealClass 1155
StepStringClass 1169
SetLimit (set search values) 938
SetLimit (set smooth data distribution) . 1122, 1141, 1155, 1169
SetLimitNeeded 1123, 1170
StepClass 1123
StepStringClass 1170
SetLimitNeeded (return static/dynamic boundary flag) 1170
SetLine 75, 114
ASCIIFileClass 75
ASCIIViewerClass 114
SetLine (a virtual to position the file) 75
SetLine (position to specific line) 114
SetLineRelative 115
ASCIIViewerClass 115
SetLineRelative (move n lines) 115
SetLocatorField 205
SetLocatorFromSort 205
SetLogErrors 528
SetLogoutOff 1253
SetMask 1105
SelectFileClass 1105
SetMask (set file dialog file masks) 1105
SetMessageText 529
SetName 669
FileManagerClass 669
SetName (set current filename) 669
SetOption (set fuzzymatch options) 702
SetOrder 1303
ViewManagerClass 1303
SetOrder (replace a sort order) 1303
SetParentControl 1331
SetParentDefaults 1332
WindowResizeClass 1332
SetParentDefaults (set default parent controls) 1332
SetPercentile 76
ASCIIFileClass 76
SetPercentile (set file to relative position) . 76
SetPosition
PrintPreviewClass 895
SETPOSITION 895
SetPosition (set initial preview window coordinates) 895
SetProcedureName 530
SetProcedureName (stores procedure names 530
SetProgressLimits 915
SetQueueRecord 206, 596
BrowseClass 206
FileDropClass 596
SetQueueRecord (copy data from file buffer to queue buffer) 206, 596
SetQuickPopup 940
SetQuickPopup (add QuickQBE to browse popup) 940
SetQuickScan 1026
RelationManagerClass 1026
SetQuickScan (enable QuickScan on a file and any related files) 1026
SetReadOnly 348, 394

SetReadOnly (set edit control to read-only EditDropClass) 394
SetReadOnly (set edit control to read-only) 348
SetReportTarget 1055
SetResponse 1384
WindowManagerClass 1384
SetResponse (OK or Cancel the window) 1384
SetShadow 485
SetShadow (update shadow value) 831
SetShadow(set shadow value) 485
SetSilent 531
SetSort 207, 1304
BrowseClass 207
ViewManagerClass 1304
SetSort (apply a sort order to the browse) 207
SetSort (set the active sort order) 1304
SetStaticControlsAttributes 1055
SetStrategy 1333
WindowResizeClass 1333
SetStrategy (set control resize strategy) 1333
SetTarget
ToolbarClass 1194
SETTARGET 1194
SetTarget (sets the active target) 1194
SetText 867, 963
PopupClass 867
SetText (set prompt text QueryFormVisual) 963
SetText (place text into rich text control) . 310
SetText (set menu item text) 867
SetThread (read triggerqueue) 330
SetTimeout 1254
SetTopic (set the current HTML Help file topic) 1177
SetTranslator 116, 869
ASCIIViewerClass 116
PopupClass 869
SetTranslator (set run-time translator) ... 116, 869
Setup 95
ASCIISearchClass 95
Setup (set search constraints) 95
SetupAdditionalFeqs (initialize additional control properties) 840
SetViewPosition(set VIEW position) 223
SetZoom 896
SetZoomPercentile
PrintPreviewClass 896
SetZoomPercentile (set user or standard zoom factor) 896
Shadow 481
EntryLocatorClass 481
Shadow (the search value) 481
ShowControl (hide/unhide RTF control) .. 311
ShowDocumentTips show tips on docuement in the preview window 286
ShowIndex (open the HTML Help index tab) 1177
ShowOnField 760
ShowOnStatusBar 761
ShowReportControls show print controls 287
ShowSearch (open the HTML Help search tab) 1178
ShowTOC (open the HTML Help contents tab) 1178
ShowToolbarTips 288
ShowToolbarTips show tips on preview window toolbar 288
ShowTopic (display a help topic) 1178
Silent Database Operations
FileManagerClass 613
SkipHeldRecords 612
FileManagerClass 612
SkipHeldRecords (HELD record switch) . 612
SkipPreview 1039
ReportManagerClass 1039
SkipPreview (print rather than preview) 1039
Sort
BrowseClass 166
SORT 166
Sort (browse sort information) 166
SortChars 1163
StepStringClass 1163
SortChars (valid sort characters) 1163
StandardBehavior Class Concepts 1107
StandardBehavior Methods 1109
StandardBehavior Overview 1107
StandardBehavior Properties 1108
StandardBehavior Source Files 1107
StandardErrorLogClass Overview 1111
StandardErrorLogClass Properties 1112

StandardErrorLogClass Source Files ... 1111
Start ... 1255
StartAtCurrent ... 167
  BrowseClass ... 167
StartAtCurrent (initial browse position) ... 167
StepClass ... 1115, 1116
  properties ... 1117
StepClass Overview ... 1115
StepClass Properties ... 1117
StepCustomClass ... 1125, 1126, 1127
  GetPercentile ... 1165
  GetValue ... 1166
  Init ... 1167
  methods ... 1130
  properties ... 1129
StepCustomClass Methods ... 1130
StepCustomClass Overview ... 1125
StepCustomClass Properties ... 1129
StepLocatorClass
  methods ... 1147
  properties ... 1146
StepLocatorClass Methods ... 1147
StepLocatorClass Overview ... 1143
StepLocatorClass Properties ... 1146
StepLongClass ... 1135, 1136
  methods ... 1139
  properties ... 1138
StepLongClass Methods ... 1139
StepLongClass Overview ... 1135
StepLongClass Properties ... 1138
StepRealClass ... 1149, 1150
  methods ... 1153
  properties ... 1152
StepRealClass Methods ... 1153
StepRealClass Overview ... 1149
StepRealClass Properties ... 1152
StepStringClass ... 1157, 1158, 1159, 1160
  methods ... 1165
  properties ... 1162
StepStringClass Methods ... 1165
StepStringClass Overview ... 1157
StepStringClass Properties ... 1162
Style (font style) ... 837
SubsString ... 532
  ErrorClass ... 532
SubsString (resolves error message
  macros) ... 532
SyncGroup (initialize GROUP field
  properties) ... 774
SyncImageQueue ... 897
TAB ... 460
Tab (action on a tab key) ... 460
TabAction ... 168
  BrowseClass ... 168
TabAction (edit-in-place action on tab key)
  ... 168
TagHTMLHelp ABC Template
  Implementation ... 1171
TagHTMLHelp Class Concepts ... 1171
TagHTMLHelp Methods ... 1172
TagHTMLHelp Source Files ... 1171
TagHTMLHelpOverview ... 1171
Take ... 941
Take (process QuickQBE popup menu
  choice) ... 941
Take (update the log file) ... 545
TakeAcceptAll ... 470
TakeAccepted ... 348, 485, 696, 832, 898, 991, 1385
  LocatorClass ... 832
  PrintPreviewClass ... 898
  QueryFormVisual ... 964
  WindowManager ... 1385
TakeAccepted (a virtual to process EVENT
  Accepted) ... 1385
TakeAccepted (handle query dialog EVENT
  Accepted events
    QueryFormVisual) ... 964
  Accepted events) ... 991
TakeAccepted (handle query dialog EVENT
  Accepted events) ... 1002
TakeAccepted (process accepted event)
  ... 579, 840
TakeAccepted (process an accepted locator
  value) ... 832
TakeAccepted (process EVENT
  Accepted events) ... 898
TakeAccepted (process window controls)
  ... 1182
TakeAcceptedLocator ... 208
  BrowseClass ... 208
TakeAcceptedLocator (apply an accepted
  locator value) ... 208
TakeAcepted ... 1002

TakeAction 471
EditMultiSelectClass 439
TakeAction (process MultiSelect dialog action) 439
TakeAction (process edit-in-place action) 471
TakeBenign 533
ErrorClass 533
TakeBenign (process benign error) 533
TakeCloseEvent 1057, 1386
ReportManagerClass 1057
WindowManagerClass 1386
TakeCloseEvent (a virtual to Cancel the window) 1386
TakeCloseEvent (a virtual to process EVENT CloseWindow) 1057
TakeCompleted 142, 472, 992, 1388
QueryFormVisual 965
TakeCompleted (complete the query dialog QueryFormVisual) 965
TakeCompleted (complete the query dialog) 992
TakeCompleted (process completion of edit EIPManagerClass) 472
TakeCompleted (process completion of edit) 142
TakeError 534
ErrorClass 534
TakeError (process specified error) 534
TakeEvent 117, 209, 395, 448, 473, 579, 597, 761, 899, 993, 1195, 1204, 1223, 1224, 1239, 1390
ASCIIViewerClass 117
BrowseClass 209
EditClass 349
EditColorClass 376, 415
EditFontClass 426
EditMultiSelectClass 442
FileDropClass 597
FileDropComboClass 579
PrintPreviewClass 899
ToolbarClass 1195
ToolbarListBoxClass 1204
ToolbarTargetClass 1223
ToolbarUpdateClass 1239
WindowManagerClass 1390
TakeEvent (process edit-in-place events QueryListVisual) 993
TakeEvent (process edit-in-place events) 349, 415
TakeEvent (process window specific events) 473
TakeEvent (a virtual to process all events) 1390
TakeEvent (convert toolbar events) 1204, 1223, 1239
TakeEvent (process ACCEPT loop event) 117
TakeEvent (process all events) 899
TakeEvent (process the current ACCEPT loop event) 209, 579, 597, 775
TakeEvent (process toolbar event) 1195
TakeEvent (process window events) 779
TakeEvent(process the current ACCEPT loop event) 1313
TakeEvent(process the current event) 232
TakeEventofParent 762
TakeFatal 535
ErrorClass 535
TakeFatal (process fatal error) 535
TakeFieldEvent 474, 900, 966, 994, 1003, 1391
PrintPreviewClass 900
WindowManager 1391
TakeFieldEvent (process field specific events) 474
TakeFieldEvent (a virtual to process field events QueryFormVisual) 966
TakeFieldEvent (a virtual to process field events QueryListVisual) 994
TakeFieldEvent (a virtual to process field events QueryVisualClass) 1003
TakeFieldEvent (a virtual to process field events) 900, 1391
TakeFocusLoss 475
TakeFocusLoss (a virtual to process loss of focus) 475
TakeKey 210, 486, 795, 832, 1148
BrowseClass 210
IncrementalLocatorClass 795
LocatorClass 832
StepLocatorClass 1148
TakeKey (process an alerted keystroke) 210, 795, 832, 1148

TakeNewSelection 211, 476, 580, 598
BrowseClass.....211
FileDropClass 598
FileDropComboClass 580
WindowManagerClass.....1392
TakeNewSelection (reset edit-in-place column
EIPManagerClass) 476
TakeNewSelection (reset edit-in-place column).....143
TakeNewSelection (a virtual to process EVENT
NewSelection) 1392
TakeNewSelection (process a new selection) 211
TakeNewSelection (process EVENT NewSelection events).....580, 598
TakeNoRecords 1058
ReportManagerClass.....1058
TakeNoRecords (process empty report)1058
TakeNotify 536, 1393
ErrorClass.....536
TakeNotify (process notify error).....536
TakeOther 537
ErrorClass.....537
TakeOther (process other error) 537
TakeProgram.....538
ErrorClass.....538
TakeProgram (process program error) ..538
TakeRecord.....916
ProcessClass.....916
TakeRecord (a virtual to process each report record) 916
TakeRecord(process each record).....1058
TakeRejected 1394
WindowManagerClass.....1394
TakeRejected (a virtual to process EVENT Rejected) 1394
TakeScroll 212
BrowseClass.....212
TakeScroll (process a scroll event).....212
TakeSelected 1395
WindowManagerClass.....1395
TakeSelected (a virtual to process EVENT Selected).....1395
TakeToolbar 1214, 1225, 1240
ToolbarListBoxClass.....1205
ToolbarReltreeClass 1214
ToolbarTargetClass 1225
ToolbarUpdateClass 1240
TakeToolbar (assume contol of the toolbar) 1205
TakeToolbar (assume control of the toolbar) 1214, 1225, 1240
TakeUser 539
ErrorClass.....539
TakeUser (process user error) 539
TakeVCRScroll.....213
BrowseClass.....213
TakeVCRScroll (process a VCR scroll event).....213
TakeWindowEvent 901, 1004, 1059, 1396
PrintPreviewClass.....901
ReportManager.....1059
TakeWindowEvent (process non-field events) 901
TakeWindowEvent (a virtual to process non-field events).....1059
TargetSelector.....1040
TargetSelectorCreated 1040
TerminatorField 253
TerminatorInclude 253
TerminatorValue (end of data marker) 254
TestLen.....1164
StepStringClass 1164
TestLen (length of the static step portion) 1164
TextWindowClass Concepts 1179
TextWindowClass Methods.....1181
TextWindowClass Overview.....1179
TextWindowClass Properties 1180
TextWindowClass Source Files.....1179
Throw.....540, 671
ErrorClass.....540
FileManagerClass.....671
Throw (process specified error).....540
Throw (pass an error to the error handler for processing) 671
ThrowFile.....541
ErrorClass.....541
ThrowFile (set value of %File then process error) 541
ThrowMessage.....542, 672
ErrorClass.....542

FileManagerClass 672
ThrowMessage (pass an error and text to the error handler) 672
TimeOut 1282
ViewManagerClass 1282
TimeOut (buffered pages freshness) 1282
TimeSlice 1041
ReportManagerClass 1041
TimeSlice (report resource usage) 1041
Title 445
EditColorClass 373
EditFileClass 412
EditFontClass 423
EditMultiSelectClass 434
Title (color dialog title text) 373
Title (font dialog title text) 423, 434
Title (text dialog title text) 445
Toolbar
BrowseClass 169
TOOLBAR 169
Toolbar (browse Toolbar object) 169
ToolbarClass 1183, 1184, 1185, 1186, 1188
methods 1190
properties 1190
ToolbarClass Functional Organization--Expected Use 1190
ToolbarClass Methods 1190
ToolbarClass Overview 1183
ToolbarItem 170
BrowseClass 170
ToolbarItem (browse ToolbarTarget object) 170
ToolbarListboxClass 1197
methods 1203
properties 1202
ToolbarListboxClass Methods 1203
ToolbarListBoxClass Overview 1197
ToolbarListboxClass Properties 1202
ToolbarReltreeClass
methods 1213
properties 1212
ToolbarReltreeClass Methods 1213
ToolbarReltreeClass Overview 1207
ToolbarReltreeClass Properties 1212
ToolbarTarget 1215, 1216
ToolbarTarget Functional Organization--Expected Use 1221
ToolbarTarget Overview 1215
ToolbarUpdateClass 1228, 1233
methods 1238
properties 1236
ToolbarUpdateClass Methods 1238
ToolbarUpdateClass Overview 1228
ToolbarUpdateClass Properties 1236
ToolTip 762
TopLine 101
ASCIIViewerClass 101
ToShowValues 763
TransactionCommit 1257
TransactionManager 1242
TransactionRollback 1258
TranslateControl 1268
TranslatorClass 1268
TranslateControl (translate text for a control) 1268
TranslateControls 1269
TranslatorClass 1269
TranslateControls (translate text for range of controls) 1269
TranslateString 1270
TranslatorClass 1270
TranslateString (translate text) 1270
TranslateWindow 1271
TranslatorClass 1271
TranslateWindow (translate text for a window) 1271
Translator 82, 91, 1356
AsciiPrintClass 82
ASCIISearchClass 91
WindowManager 1356
Translator (TranslatorClass object) 1356
TranslatorClass 1259, 1260, 1261, 1262
methods 1265
properties 1264
TranslatorClass Methods 1265
TranslatorClass Overview 1259
TranslatorClass Properties 1264
TriggerQueue (pointer to BFP for field changes) 326
TryFetch 674, 807
FileManagerClass 674
INIClass 807
TryFetch (get a value from the INI file) 807

TryFetch (try to get a specific record by key value) 674
TryFetchField 808
INIClass 808
TryFetchField (return comma delimited INI file value) 808
TryInsert 675
TryNext 676
FileManagerClass 676
TryNext (try to get next record in sequence) 676
TryOpen 677
FileManagerClass 677
TryOpen (try to open the file) 677
TryPrevious 678
FileManagerClass 678
TryPrevious (try to get previous record in sequence) 678
TryPrimeAutoInc 679
FileManagerClass 679
TryPrimeAutoInc (try to prepare an autoincremented record for adding) 679
TryReget 681
TryTakeToolbar 1206, 1225, 1241
ToolbarListBoxClass 1206
ToolbarTargetClass 1225
ToolbarUpdateClass 1241
TryTakeToolbar (return toolbar control indicator) 1206, 1225, 1241
TryUpdate 681
FileManagerClass 681
TryUpdate (try to change the current record) 681
TryValidateField(validate field contents) . 682
Txt (field equate number) 1180
Undo (undo action) 311
UniquePosition (check queue for duplicate record by key position) 581
Update
EntryLocatorClass 487
FileManagerClass 683
INIClass 810
RelationManagerClass 1027
UPDATE 487, 683, 809, 810, 1027, 1397
Update (change the current record) 683
Update (update record subject to referential constraints) 1027
Update (update the audit log file buffer) .. 331
Update (update the locator control and free elements) 487
Update (write INI file entries) 809
Update(FileManager) 1359
Update(get VIEW data for the selected item) 1314
Update(update entry in LIST queue) 224
UpdateBuffer 214
BrowseClass 214
UpdateBuffer (copy selected item from queue buffer to file buffer) 214
UpdateControl (file update trigger) 769
UpdateControl(updates the edit-in-place entry control) 995
UpdateControlEvent 769
UpdateFields 967, 995
UpdateFields (process query values) ... 967, 995
UpdateQuery (set default query interface) 215
UpdateResets 216
BrowseClass 216
UpdateResets (copy reset fields to file buffer) 216
UpdateThumb 217
BrowseClass 217
UpdateThumb (position the scrollbar thumb) 217
UpdateThumbFixed 218
BrowseClass 218
UpdateThumbFixed (position the scrollbar fixed thumb) 218
UpdateViewRecord 219
BrowseClass 219
UpdateViewRecord (get view data for the selected item) 219
UpdateWindow 220, 487, 697, 833
BrowseClass 220
EntryLocatorClass 487
FilterLocatorClass 697
LocatorClass 833
UpdateWindow (apply the search criteria) 697
UpdateWindow (redraw the locator control with its current value) 833

UpdateWindow (redraw the locator control) 487
UpdateWindow (update display variables to match browse) 220
UpdateWindow(update window controls) 1314
UseField 570
FileDropComboClass 570
UseField (COMBO USE variable) 570
UseFile 684
FileManagerClass 684
UseFile (use LazyOpen file) 684
UseLogout (transaction framing flag) 1010
UserPercentile 880
PrintPreviewClass 880
UserPercentile (custom zoom factor) 880
UseView 1305
ViewManagerClass 1305
UseView (use LazyOpen files) 1305
ValidateField 686
FileManagerClass 686
ValidateField (validate a field) 686
ValidateFields 687
FileManagerClass 687
ValidateFields (validate a range of fields) 687
ValidateFieldServer(validate field contents) 688
ValidateLine 77
ASCIIFileClass 77
ValidateLine (a virtual to implement a filter) 77
ValidateRecord 599, 689, 1306
FileDropClass 599
FileManagerClass 689
ViewManagerClass 1306
ValidateRecord (a virtual to validate records) 599
ValidateRecord (validate all fields) 689
ValidateRecord (validate an element) ... 1306
ValueEIP(reference to QEditEntryClass) 985
VCRRequest 1356
WindowManagerClass 1356
VCRRequest (delayed scroll request) ... 1356
View
ViewManagerClass 1282
VIEW 1282
View (the managed VIEW) 1282
ViewHistory (initiates the view of the current errors) 542
ViewManager 826, 1273, 1274, 1275
LocatorClass 826
methods 1283
properties 1278
ViewManager (the locator's ViewManager object) 826
ViewManager Functional Organization--Expected Use 1283
ViewManager Methods 1283
ViewManager Overview 1273
ViewManager Properties 1278
ViewMenu 871
PopupClass 871
ViewMenu (popup menu debugger) 871
VLBProc (retrieve LIST and error history information.) 780
WaitCursor 1041
Who(returns field name) 224
Win (reference to window) 778, 837
Window
BrowseClass 171
WINDOW 171, 923
Window (browse window QueryClass) .. 923
Window (WindowManager object) 227
WindowComponent Concepts 1307
WindowComponent Methods 1308
WindowComponent Overview 1307
WindowComponent Source Files 1307
WindowManager 1335, 1336, 1337, 1338, 1340, 1341
methods 1357
properties 1343
WindowManager Functional Organization--Expected Use 1357
WindowManager Methods 1357
WindowManager Overview 1335
WindowManager Properties 1343
WindowPosSet 881
PrintPreviewClass 881
WindowPosSet (use a non-default initial preview window position) 881
WindowResizeClass 1315, 1316, 1317
methods 1320
properties 1319

WindowResizeClass Functional Organization--Expected Use 1320
WindowResizeClass Methods..... 1320
WindowResizeClass Overview 1315
WindowResizeClass Properties..... 1319
WindowSizeSet 881
PrintPreviewClass 881
WindowSizeSet (use a non-default initial preview window size)..... 881
WindowTitle..... 1101
SelectFileClass..... 1101
WindowTitle (file dialog title text)..... 1101
WMFParser 1041
Zoom 1042
ReportManagerClass..... 1042
Zoom (initial report preview magnification) 1042
ZoomIndex..... 882
PrintPreviewClass..... 882
ZoomIndex (index to applied zoom factor) 882