## Figures, Tables, and Listings

Chapter 1	Resource Manager 1-1	
	Figure 1-1	The data fork and resource fork of a file 1-4
	Figure 1-2	An application's and a document's data fork and resource fork 1-6
	Figure 1-3	Resource attributes 1-8
	Figure 1-4	A typical search order for a specific resource 1-11
	Table 1-1	Typical locations of resources 1-12
	Figure 1-5	The ResEdit window for the SurfWriter application 1-15
	Figure 1-6	The menus of the SurfWriter application 1-16
	Listing 1-1	A menu in Rez input format 1-17
	Figure 1-7	Getting a handle to a resource 1-19
	Figure 1-8	A handle to a purgeable resource after the resource has been purged 1-20
	Listing 1-2	Safely changing a resource that is purgeable 1-21
	Listing 1-3	Releasing a resource 1-22
	Figure 1-9	Detaching a resource 1-23
	Listing 1-4	Detaching a resource 1-24
	Listing 1-5	Getting the file reference number for your application's resource fork 1-25
	Listing 1-6	Creating an empty resource fork 1-26
	Listing 1-7	Creating and opening a resource fork 1-27
	Listing 1-8	Saving and restoring the current resource file 1-29
	Listing 1-9	Getting a resource from a document file 1-32
	Listing 1-10	Counting and indexing through resources 1-34
	Listing 1-11	Saving a resource to a resource fork 1-38
	Listing 1-12	Using partial resource routines 1-41
	Table 1-2	Standard resource types 1-43
	Table 1-3	Resource types reserved for use by system software 1-46
	Figure 1-10	Resource ID of an owned resource 1-48
	Figure 1-11	Format of a resource fork 1-121
	Figure 1-12	Format of a resource header in a resource fork 1-122
	Figure 1-13	Format of resource data for a single resource 1-122
	Figure 1-14	Format of the resource map in a resource fork 1-123
	Figure 1-15	Format of an item in a resource type list 1-123
	Figure 1-16	Format of an entry in the reference list for a resource type 1-124
	Figure 1-17	Format of an item in a resource name list 1-124
	Figure 1-18	Offsets in a resource fork and an entry for a single resource in a reference list 1-125
	Table 1-4	Document and application icons 1-130
	Table 1-5	Folder icons 1-131
	Table 1-6	System Folder icons 1-132
	Table 1-7	Desktop icons 1-133
	Table 1-8	Standard File Package icons 1-133
	Figure 1-19	Structure of a compiled ROM override ('ROv#') resource 1-136

Chapter 2	Scrap Manage	r 2-1
	Figure 2-1	Copying and pasting data between two applications using the scrap 2-5
	Table 2-1	Actions your application perfoms in response to editing commands 2-6
	Figure 2-2	Writing both standard formats to the scrap 2-8
	Figure 2-3	Using a private scrap 2-9
	Figure 2-4	Intelligent cut and paste 2-11
	Figure 2-5	Non-intelligent cut and paste 2-11
	Figure 2-6	Location of the scrap in memory 2-13
	Listing 2-1	Writing data to the scrap 2-16
	Listing 2-2	Writing data to a private scrap 2-18
	Listing 2-3	Copying data from the scrap in response to suspend events 2-19
	Listing 2-4	Handling the Paste command using the scrap 2-21
	Listing 2-5	Handling the Paste command using a private scrap 2-24
	Listing 2-6	Handling resume events 2-25
	Listing 2-7	Converting data between the scrap and a private scrap 2-27
	Listing 2-8	Using TextEdit to handle the Cut command 2-29
	Listing 2-9	Using TextEdit to handle the Paste command 2-30
Chapter 3	Help Manager	3-1
	Figure 3-1	The Help menu for the Finder 3-7
	Figure 3-2	A help balloon drawn with the standard balloon definition function 3-8
	Figure 3-3	The tip and hot rectangle for a help balloon 3-9
	Figure 3-4	Standard balloon positions and their variation codes 3-10
	Figure 3-5	Alternate positions of a help balloon 3-11
	Figure 3-6	Default help balloons for the window frame 3-15
	Figure 3-7	Default help balloons for the Apple and Help menus 3-16
	Figure 3-8	Default help balloons for application and document icons 3-17
	Figure 3-9	Help balloons for different states of the Cut command 3-29
	Listing 3-1	Rez input for a partial 'hmnu' resource 3-31
	Listing 3-2	Rez input for the missing-items component of an 'hmnu' resource 3-35
	Figure 3-10	A help balloon for an enabled menu title 3-37
	Figure 3-11	A help balloon for a dimmed menu title 3-37
	Figure 3-12	A help balloon for a menu title dimmed by the Dialog Manager 3-38
	Figure 3-13	A help balloon for menu items dimmed by the Dialog Manager 3-38
	Figure 3-14	A help balloon for a menu item 3-39
	Figure 3-15	A help balloon for a dimmed menu item 3-40
	Listing 3-3	Rez input for corresponding 'hmnu' and 'STR#' resources 3-41
	Listing 3-4	Rez input for an 'hmnu' resource that uses HMCompareItem for a changing menu item 3-44
	Figure 3-16	Help balloons for a changing menu item 3-45
	Listing 3-5	Rez input for specifying help messages with named resources 3-46

Listing 3-6	Specifying an alternate 'hmnu' resource for a menu that your application disables when it displays movable modal dialog boxes 3-49
Listing 3-7	Reassigning 'hmnu' resources before displaying a movable modal dialog box $$3\text{-}50$$
Listing 3-8	Rez input for an item list resource and an 'hdlg' resource 3-59
Figure 3-17	A help balloon in a modal dialog box 3-61
Figure 3-18	Static and dynamic windows 3-64
Figure 3-19	A tool palette with a help balloon 3-70
Listing 3-9	Rez input for corresponding 'hwin' and 'hrct' resources 3-71
Figure 3-20	A help balloon for a dialog box with a title 3-72
Listing 3-10	Rez input for specifying help for titled and untitled windows 3-72
Listing 3-11	Using a string resource as the help message for HMShowBalloon 3-77
Listing 3-12	Using a picture resource as the help message for HMShowBalloon 3-77
Listing 3-13	Using a handle to a picture resource as the help message for HMShowBalloon 3-78
Listing 3-14	Using a string list resource as the help message for HMShowBalloon 3-79
Listing 3-15	Using styled text resources as the help message for HMShowBalloon 3-80
Listing 3-16	Using HMShowBalloon to display help balloons 3-82
Figure 3-21	Default and custom help balloons for an application icon 3-86
Listing 3-17	Rez input for creating an 'hfdr' resource for an application icon 3-86
Listing 3-18	Rez input for an 'hovr' resource 3-89
Figure 3-22	The Help menu with an appended menu item 3-90
Listing 3-19	Rez input for specifying help balloons for items in the Help menu 3-91
Listing 3-20	Responding to the user's choice in a menu command 3-92
Listing 3-21	Using the HMExtractHelpMsg function 3-124
Listing 3-22	Using a tip function 3-131
Figure 3-23	Structure of a compiled menu help ('hmnu') resource 3-133
Figure 3-24	Structure of an 'hmnu' component compiled with the HMStringItem identifier 3-135
Figure 3-25	Structure of an 'hmnu' component compiled with the HMStringResItem identifier 3-136
Figure 3-26	Structure of an 'hmmu' component compiled with the HMPictItem, HMTEResItem, or HMSTRResItem identifier 3-137
Figure 3-27	Structure of an 'hmnu' component compiled with the HMSkipItem identifier 3-138
Figure 3-28	Structure of a menu-item component compiled with the HMCompareItem identifier 3-139
Figure 3-29	Structure of a menu-item component compiled with the HMNamedResourceItem identifier 3-140
Figure 3-30	Structure of a compiled dialog-item help ('hdlg') resource 3-141
Figure 3-31	Structure of an 'hdlg' component compiled with the HMStringItem identifier 3-144

Figure 3-32	Structure of an 'hdlg' component compiled with the HMStringResItem identifier 3-145
Figure 3-33	Structure of an 'hdlg' component compiled with the HMPictItem, HMTEResItem, Or HMSTRResItem
	identifier 3-146
Figure 3-34	Structure of an 'hdlg' component compiled with the HMSkipItem identifier 3-148
Figure 3-35	Structure of a compiled rectangle help ('hrct') resource 3-149
Figure 3-36	Structure of an 'hret' component compiled with the HMStringItem identifier 3-150
Figure 3-37	Structure of an 'hrct' component compiled with the HMStringResItem identifier 3-151
Figure 3-38	Structure of an 'hrct' component compiled with the HMPictItem, HMTEResItem, Or HMSTRResItem identifier 3-152
Figure 3-39	Structure of an 'hrct' component compiled with the HMSkipItem identifier 3-153
Figure 3-40	Structure of a compiled window help ('hwin') resource 3-155
Figure 3-41	Structure of a compiled Finder icon help ('hfdr') resource 3-157
Figure 3-42	Structure of an 'hfdr' component compiled with the HMStringItem identifier 3-158
Figure 3-43	Structure of an 'hfdr' component compiled with the HMStringResItem identifier 3-158
Figure 3-44	Structure of an 'hfdr' component compiled with the HMPictItem, HMTEResItem, Or HMSTRResItem identifier 3-159
Figure 3-45	Structure of an 'hfdr' component compiled with the HMSkipItem identifier 3-160
Figure 3-46	Structure of a compiled default help override ('hovr') resource 3-161
Figure 3-47	Structure of an 'hovr' component compiled with the HMStringItem identifier 3-163
Figure 3-48	Structure of an 'hovr' component compiled with the HMStringResItem identifier 3-163
Figure 3-49	Structure of an 'hovr' component compiled with the HMPictItem, HMTEResItem, or HMSTRResItem identifier 3-164
Figure 3-50	Structure of an 'hovr' component compiled with the HMSkipItem identifier 3-165
List Manager	4-1
Figure 4-1	A one-column, text-only list without a scroll bar 4-4
Figure 4-2	A one-column, text-only list with a vertical scroll bar 4-5
Figure 4-3	A list whose scroll bar has been disabled 4-6 A deactivated list 4-6
Figure 4-4 Figure 4-5	A list containing multiple columns and graphical elements 4-7
Figure 4-6	A list of items whose cells display more than one type of information 4-8
Figure 4-7	A list with an item selected 4-9
Figure 4-8 Figure 4-9	Selection of a range of items in a list 4-10 Effect of dragging after Shift-clicking 4-11

Chapter 4

Figure 4-10	Selection of discontiguous items in a list 4-12
Figure 4-11	Effect of Shift-clicking in a list that contains discontiguous items 4-13
Figure 4-12	Notifying the user of nonstandard list behavior 4-14
Figure 4-13	Response to pressing the Command–Up Arrow keys 4-16
Figure 4-14	Response to user making a discontiguous selection, then pressing Shift–Right Arrow followed by Shift–Left Arrow using the extend algorithm 4-17
Figure 4-15	Response to Shift–Right Arrow using the anchor algorithm 4-19
Figure 4-16	An outlined list in a window with more than one list 4-21
Figure 4-17	Coordinates of cells 4-22
Listing 4-1	Creating a list with a vertical scroll bar 4-27
Listing 4-2	Installing a list in a dialog box 4-29
Listing 4-3	Drawing a border around a list 4-30
Listing 4-4	Adding items from a string list to a one-column, text-only list 4-31
Listing 4-5	Responding to a mouse-down event in a list 4-33
Listing 4-6	Responding to an update event in a list 4-33
Listing 4-7	Finding the first selected cell in a list 4-34
Listing 4-8	Finding the last selected cell in a list 4-35
Listing 4-9	Selecting a cell and deselecting other cells 4-36
Listing 4-10	Scrolling so that a particular cell is visible 4-37
Figure 4-18	Selection flags 4-38
Listing 4-11	Clearing all cell data 4-40
Listing 4-12	Getting a copy of the data of a cell 4-41
Listing 4-13	Directly accessing a cell's data 4-41
Listing 4-14	Adding an item to a one-column, alphabetical text list 4-42
Listing 4-15	A match function 4-43
Listing 4-16	Searching a list for a cell containing certain text or the next cell alphabetically 4-44
Listing 4-17	Resetting variables related to type selection 4-46
Listing 4-18	Selecting an item in response to a key-down event 4-47
Listing 4-19	Determining the location of a new cell in response to an arrow-key event 4-49
Listing 4-20	Moving the selection in response to an arrow-key event 4-50
Listing 4-21	Extending the selection in response to an arrow-key event 4-51
Listing 4-22	Processing an arrow-key event 4-52
Listing 4-23	Drawing an outline around a list 4-54
Listing 4-24	Adding a list to the ring 4-55 Updating the outline of all lists in a window 4-56
Listing 4-25 Listing 4-26	Updating the outline of all lists in a window 4-56  Moving the outline to the next list in a window 4-57
Listing 4-27	Moving the outline to the previous list in a window 4-57  Moving the outline to the previous list in a window 4-57
Figure 4-19	The Chooser's use of a custom list definition procedure 4-58
Listing 4-28	Processing messages to a list definition procedure 4-59
Listing 4-29	Using the default initialization method 4-60
Listing 4-20	Responding to the 1DrawMsg message 4-61
Listing 4-30	Responding to the liliteMsg message 4-62
Listing 4-31	Responding to the ICloseMsg message 4-63
Listing 4-33	Setting the cell size of a list 4-63
Listing 4-34	Adding an icon to a list of icons 4-64
J	<u> </u>

Chapter 5	Icon Utilities	5-1
	Figure 5-1	The ResEdit view of an icon 5-4
	Figure 5-2	An icon family 5-5
	Listing 5-1	Drawing the icon from an icon family that is best suited to the user's display 5-10
	Listing 5-2	Drawing the icon from an icon suite that is best suited to the display device 5-11
	Listing 5-3	Drawing a specific icon from an icon family or icon suite 5-12
	Listing 5-4	Manipulating icon data in memory 5-13
	Listing 5-5	Drawing an icon of resource type 'ICON' 5-14
	Listing 5-6	Drawing an icon of resource type 'ICON' with a specific alignment and transform 5-15
	Listing 5-7	Drawing an icon of resource type 'cicn' 5-15
	Listing 5-8	Drawing an icon of resource type 'cicn' with a specific alignment and transform 5-16
	Listing 5-9	Drawing an icon of resource type 'SICN' with a specific alignment and transform 5-16
Chapter 6	Component M	lanager 6-1
•	<u>-</u>	
	Figure 6-1	The relationship between an application, the Component Manager, and components 6-5
	Listing 6-1	Finding a component 6-9
	Listing 6-2	Opening a specific component 6-10
	Listing 6-3	Getting information about a component 6-10
	Listing 6-4	Using a drawing component 6-11
	Table 6-1	Request codes 6-14
	Listing 6-5	A drawing component for ovals 6-16
	Listing 6-6	Responding to an open request 6-20
	Listing 6-7	Responding to a close request 6-21
	Listing 6-8	Responding to the can do request 6-22
	Listing 6-9	Responding to the setup request 6-26
	Listing 6-10	Responding to the draw request 6-27
	Listing 6-11	Responding to the erase request 6-27
	Listing 6-12	Responding to the click request 6-27
	Listing 6-13	Responding to the move to request 6-28
	Listing 6-14	Registering a component 6-31
	Listing 6-15	Rez input for a component resource 6-33
	Figure 6-2	Supporting multiple component connections 6-34
	Listing 6-16	Delegating a request to another component 6-36
	Figure 6-3	Interaction between the componentFlags and componentFlagsMask fields 6-40
	Figure 6-4	Format of a component file 6-84
	Figure 6-5	Structure of a compiled component ('thng') resource 6-85
Chapter 7	Translation Ma	anager 7-1
	Figure 7-1	The Finder's application-unavailable alert box 7-5
	Figure 7-2	The application-unavailable alert box for 'TEXT' and 'PICT' documents 7-5

	Figure 7-3	The translation choices dialog box 7-6
	Figure 7-4	A translation progress dialog box 7-7
	Figure 7-5	The modified application-unavailable alert box 7-7
	Figure 7-6	The enhanced file-opening dialog box 7-8
	Figure 7-7	Document Converter configuration dialog box 7-9
	Listing 7-1	Translation-specific selectors and response bit for Gestalt 7-12
	Listing 7-2	A sample resource of type 'open' 7-13
	Listing 7-3	A sample resource of type 'kind' 7-15
	Listing 7-4	Sample resources for a translation extension 7-22
	Listing 7-5	Handling Component Manager request codes 7-25
	Figure 7-8	A translation group with multiple source and destination types 7-29
	Figure 7-9	A translation group with a single destination type 7-29
	Figure 7-10	Point-to-point translation 7-30
	Listing 7-6	Creating a file translation list 7-30
	Listing 7-7	Identifying file types 7-33
	Listing 7-8	Translating a document 7-34
	Figure 7-11	Structure of a compiled open ('open') resource 7-44
	Figure 7-12	Structure of a compiled kind ('kind') resource 7-45
Chapter 8	Control Panels	8-1
	Figure 8-1	Two control panels, each with its own window 8-5
	Figure 8-2	The General Controls control panel 8-6
	Figure 8-3	Control panel icons in the Control Panels folder 8-9
	Figure 8-4	The Monitors control panel 8-10
	Figure 8-5	An Options dialog box for the SurfBoard video card 8-11
	Figure 8-6	The River control panel interface 8-13
	Figure 8-7	An icon for the River control panel file 8-14
	Figure 8-8	The Color control panel 8-15
	Figure 8-9	Coordinates defining the rectangles of the River control panel display area 8-16
	Listing 8-1	Rez input for a rectangle positions list ('nrct') resource 8-16
	Listing 8-2	Rez input for an item list ('DITL') resource 8-18
	Listing 8-3	Rez input for a machine ('mach') resource 8-21
	Listing 8-4	Rez input for a file reference ('FREF') resource 8-21
	Table 8-1	Possible settings for the machine resource masks 8-21
	Listing 8-5	Rez input for a signature resource 8-22
	Listing 8-6	Rez input for a bundle ('BNDL') resource 8-22
	Listing 8-7	A control panel's static text defined as user items 8-24
	Listing 8-8	A control device function 8-27
	Listing 8-9	Initializing a control panel: Allocating memory and setting controls 8-31
	Figure 8-10	Example of an inactive control panel 8-34
	Listing 8-10	Responding to an activate event 8-35
	Listing 8-11	Responding to a keyboard event 8-38
	Listing 8-12	Responding to the user's interaction with controls 8-41
	Listing 8-13	Responding to update events 8-43
	Listing 8-14	Drawing text defined as user items 8-44

Listing 8-15	Terminating a control device function when the user closes the control panel 8-45
Listing 8-16	Responding to Edit menu commands 8-46
Table 8-2	Error codes and their meaning 8-47
Figure 8-11	An Options dialog box with standard controls 8-49
Figure 8-12	An Options dialog box with superuser controls 8-50
Figure 8-13	The SurfBoard monitors extension icon 8-51
Listing 8-17	Rez input for a card ('card') resource 8-52
Figure 8-14	Display area defined by a rectangle resource 8-53
Listing 8-18	Rez input for a rectangle ('RECT') resource 8-53
Figure 8-15	The SurfBoard Options dialog box with superuser controls 8-54
Listing 8-19	Rez input for the SurfBoard monitors extension item list resource 8-55
Listing 8-20	Rez input for icon family resources for a monitors extension 8-57
Listing 8-21	Rez input for a version ('vers') resource 8-58
Listing 8-22	Rez input for the SurfBoard string list resource 8-59
Listing 8-23	Rez input for a file reference resource of a monitors extension 8-60
Listing 8-24	Rez input for a bundle resource of a monitors extension 8-60
Listing 8-25	A monitors extension function 8-64
Listing 8-26	Handling the startup message 8-66
Listing 8-27	Using a normal user rectangle or extending it to display superuser controls 8-68
Listing 8-28	Initializing a monitors extension 8-69
Listing 8-29	Drawing a line to separate superuser controls 8-70
Listing 8-30	Responding when a user clicks a control 8-72
Table 8-3	Messages from the Finder 8-77
Table 8-4	Messages from the Monitors control panel 8-81
Figure 8-16	Structure of a compiled machine ('mach') resource 8-85
Figure 8-17	Structure of a compiled rectangle positions ('nrct') resource 8-86
Table 8-5	Possible settings for the machine resource masks 8-86
Figure 8-18	Structure of a compiled font information ('finf') resource 8-87
Figure 8-19	Structure of a compiled card ('card') resource 8-88
Figure 8-20	Structure of a compiled rectangle ('RECT') resource 8-89