File created: 5-Dec-2020 16:35:05 **{DSK}<Users>arunwelch>SKYDRIVE>DOCUMENTS>UNIX>LISP>LDE>ROOMS>MEDLEY-35>ROOMS-BUTTONS.;3**

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Read Table: XCL

Package: ROOMS

Format: XCCS


```
(IL:RPAQQ IL:ROOMS-BUTTONSCOMS
          ((FILE-ENVIRONMENTS IL:ROOMS-BUTTONS)
           (IL:FILES (IL:SYSLOAD)
                 IL:ROOMS-D IL:ROOMS-TEXT IL:ROOMS-BIOS)
           (IL:P (EXPORT '(BUTTON *DEFAULT-BUTTON-TYPE* DEF-BUTTON-TYPE MAKE-BUTTON BUTTON-PROP
                               *BUTTON-HELP-DELAY* *BUTTON-SELECTION-SHADE* MAKE-BUTTON-WINDOW
                               SET-BUTTON-WINDOW-TEXT-STRING WITH-BUTTON *DEFAULT-BUTTON-SHADOWS*
                               MAKE-EAST-WEST-BITMAP MAKE-NORTH-SOUTH-BITMAP MAKE-NSEW-BITMAP)
                        "ROOMS"))
           (IL:COMS                                          ; button types
                 (IL:DEFINE-TYPES IL:BUTTON-TYPES)
                 (IL:STRUCTURES BUTTON-TYPE)
                 (IL:VARIABLES *BUTTON-TYPES* *DEFAULT-BUTTON-TYPE*)
                 (IL:FUNCTIONS DEF-BUTTON-TYPE BUTTON-TYPE-PROP SELECT-BUTTON-TYPE BUTTON-TYPE-NAMED)
                 (IL:SEDIT-FORMATS DEF-BUTTON-TYPE))
           (IL:COMS                                          ; the button object
                 (IL:STRUCTURES BUTTON UPDATED-BUTTON MARGINS)
                 (IL:VARIABLES *DEFAULT-BUTTON-SHADOWS*)
                 (IL:FUNCTIONS                               ; core code
                        MAKE-BUTTON COPY-BUTTON DISPLAY-BUTTON UPDATE-BUTTON SET-BUTTON-TEXT-STRING BUTTON-PROP
                        )
                 (IL:FUNCTIONS                               ; text
                        SET-BUTTON-TEXT-STRING COMPUTE-BUTTON-TEXT-POSITION BUTTON-TEXT-X-COORD
                        BUTTON-TEXT-Y-COORD TEXT-FROM-TEXT-FORM)
                 (IL:FUNCTIONS                               ; mouse code
                        BUTTON-TRACK-MOUSE PERFORM-BUTTON-ACTION EDIT-BUTTON BUTTON-COPY-SELECTED SHADE-BUTTON
                        PRINT-BUTTON-HELP))
           (IL:COMS                                          ; button windows
                 (IL:VARIABLES *BUTTON-HELP-DELAY* *BUTTON-SELECTION-SHADE*)
                 (IL:FUNCTIONS MAKE-BUTTON-WINDOW BW-REPAINTFN BW-TOTOPFN BW-BUTTONEVENTFN
                        BW-BUTTONEVENTFN-INTERNAL SET-BUTTON-WINDOW-TEXT-STRING MAYBE-RESIZE-BUTTON-WINDOW
                        BW-SCREEN-CHANGED-FUNCTION)
                 (IL:VARIABLES
                        ;; this variable also on ROOMS-CORE, but here so we can be loaded w/o loading all of rooms
                        *SCREEN-CHANGED-FUNCTIONS*)
                 (IL:P (PUSHNEW 'BW-SCREEN-CHANGED-FUNCTION *SCREEN-CHANGED-FUNCTIONS*)))
           (IL:COMS                                          ; button bitmaps
                 (IL:STRUCTURES NORTH-SOUTH-BITMAP EAST-WEST-BITMAP NSEW-BITMAP)
                 (IL:FUNCTIONS DISPLAY-BUTTON-IMAGE DISPLAY-BUTTON-MASK BUTTON-WIDTH BUTTON-HEIGHT
                        BUTTON-BITMAP-BITBLT EW-BITBLT NS-BITBLT NSEW-BITBLT PAINT-REGION))
                                                             ; externalization
           (IL:FUNCTIONS EDIT-BUTTON-WINDOW EXTERNALIZE-BUTTON EXTERNALIZE-FONT)
           (IL:FUNCTIONS WITH-BUTTON)
           (IL:BUTTON-TYPES :DOOR :SHADOWED :TRANSPARENT :PORTHOLE :ARK :ROUND-ARK :STRETCHY-ARK
                 :STRETCHY-ROUND-ARK)
           (IL:GLOBALVARS IL:MENUHELDWAIT)))


(DEFINE-FILE-ENVIRONMENT IL:ROOMS-BUTTONS :COMPILER :COMPILE-FILE
   :PACKAGE (DEFPACKAGE "ROOMS" (:USE "LISP" "XCL")
                 (:SHADOW CL:ROOM))
   :READTABLE "XCL")

(IL:FILESLOAD (IL:SYSLOAD)
       IL:ROOMS-D IL:ROOMS-TEXT IL:ROOMS-BIOS)

(EXPORT '(BUTTON *DEFAULT-BUTTON-TYPE* DEF-BUTTON-TYPE MAKE-BUTTON BUTTON-PROP *BUTTON-HELP-DELAY*
               *BUTTON-SELECTION-SHADE* MAKE-BUTTON-WINDOW SET-BUTTON-WINDOW-TEXT-STRING WITH-BUTTON
               *DEFAULT-BUTTON-SHADOWS* MAKE-EAST-WEST-BITMAP MAKE-NORTH-SOUTH-BITMAP MAKE-NSEW-BITMAP)
       "ROOMS")
```

;; button types

```
(DEF-DEFINE-TYPE IL:BUTTON-TYPES "Button types"
   :UNDEFINER (LAMBDA (NAME)
                     (REMHASH NAME *BUTTON-TYPES*)))


(DEFSTRUCT BUTTON-TYPE
   NAME
```

;; name of the type

```
   IMAGE-BITMAP
   ;; the background for the text
   MASK-BITMAP
   ;; to allow non-rectangular buttons.  should be a bitmap the same size as IMAGE-BITMAP.  designates the set of bits of IMAGE-BITMAP which are
   ;; the region to be displayed.
   (MARGINS (MAKE-MARGINS))
   ;; a MARGINS record.
   PROPS)

(DEFGLOBALVAR *BUTTON-TYPES* (MAKE-HASH-TABLE :TEST 'EQ))

(DEFPARAMETER *DEFAULT-BUTTON-TYPE* :SHADOWED)

(DEFDEFINER DEF-BUTTON-TYPE IL:BUTTON-TYPES (NAME &REST REST-KEYS &KEY IMAGE MASK (MARGINS (MAKE-MARGINS))
                                             &ALLOW-OTHER-KEYS)
   `(SETF (GETHASH ',NAME *BUTTON-TYPES*)
          (MAKE-BUTTON-TYPE :NAME ',NAME :IMAGE-BITMAP ',IMAGE :MASK-BITMAP ',MASK :MARGINS ',MARGINS :PROPS
                 ',(LET ((PROPS (COPY-LIST REST-KEYS)))
                        (DOLIST (KEYWORD '(:IMAGE :MASK :MARGINS))
                            (REMF PROPS KEYWORD))
                        PROPS))))

(DEFMACRO BUTTON-TYPE-PROP (BUTTON-TYPE PROP &OPTIONAL (NEW-VALUE NIL NEW-VALUE-SUPPLIED))
   (IF NEW-VALUE-SUPPLIED
       `(SETF (GETF (BUTTON-TYPE-PROPS ,BUTTON-TYPE)
                    ,PROP)
              ,NEW-VALUE)
       `(GETF (BUTTON-TYPE-PROPS ,BUTTON-TYPE)
              ,PROP)))

(DEFUN SELECT-BUTTON-TYPE (&OPTIONAL (REASON "Select Button Type"))
   ;; returns the name of a button type or NIL
   (MENU (WITH-COLLECTION
          (DOLIST (TYPE (SORT (WITH-COLLECTION (MAPHASH #'(LAMBDA (NAME TYPE)
                                                                  (COLLECT TYPE))
                                               *BUTTON-TYPES*))
                              #'STRING-LESSP :KEY #'BUTTON-TYPE-NAME))
              (LET ((NAME (BUTTON-TYPE-NAME TYPE)))
                   (COLLECT `(,(OR (BUTTON-TYPE-PROP TYPE :SAMPLE-IMAGE)
                                   ;; cache sample images on button type
                                   (LET* ((BUTTON (MAKE-BUTTON :TYPE NAME :TEXT (LET ((*PRINT-CASE* :CAPITALIZE
                                                                                      )
                                                                                      (*READTABLE* (
                                                                                              IL:FIND-READTABLE
                                                                                                    "XCL")))
                                                                                      (PRINC-TO-STRING NAME))))
                                                  (IMAGE (IL:BITMAPCREATE (BUTTON-WIDTH BUTTON)
                                                                          (BUTTON-HEIGHT BUTTON))))
                                                  (DISPLAY-BUTTON BUTTON IMAGE)
                                                  (BUTTON-TYPE-PROP TYPE :SAMPLE-IMAGE IMAGE)
                                                  IMAGE))
                              ',NAME)))))
         REASON))

(DEFMACRO BUTTON-TYPE-NAMED (TYPE-NAME)
   `(GETHASH ,TYPE-NAME *BUTTON-TYPES*))

(SEDIT:DEF-LIST-FORMAT DEF-BUTTON-TYPE :ARGS (NIL :KEYWORD NIL)
   :INDENT (1))

;; the button object

(DEFSTRUCT (BUTTON (:CONSTRUCTOR MAKE-BUTTON-INTERNAL)
                   (:PRINT-FUNCTION (LAMBDA (BUTTON STREAM DEPTH)
                                            (LET ((TYPE (BUTTON-TYPE BUTTON))
                                                  (TEXT (BUTTON-TEXT BUTTON)))
                                                 (FORMAT STREAM "#<~A button ~S>" (TYPECASE TYPE
                                                                                    (BUTTON-TYPE
                                                                                       (BUTTON-TYPE-NAME
                                                                                        TYPE))
                                                                                    (T TYPE))
                                                                                  (TYPECASE (BUTTON-TEXT BUTTON)
                                                                                      (TEXT (TEXT-STRING TEXT))
                                                                                      (T TEXT))))))
```

```
                    (:COPIER COPY-BUTTON-INTERNAL))
   (TYPE *DEFAULT-BUTTON-TYPE* :TYPE BUTTON-TYPE)
   ;; a BUTTON-TYPE structure
   (TEXT NIL :TYPE TEXT)
   ;; a TEXT structure
   (ACTION NIL :TYPE LIST)
   ;; form to EVAL when this button is pressed
   (HELP-STRING NIL :TYPE STRING)
   ;; printed when button is held
   (INVERTED? NIL :TYPE (MEMBER T NIL))
   ;; if true, button image will be inverted
   (%SELECTED? NIL :TYPE (MEMBER T NIL))
   ;; non-nil when button appears selected
   %MASK %IMAGE
   ;; caches used by redisplay
   (PROPS NIL :TYPE LIST))

(DEFSTRUCT (UPDATED-BUTTON (:INCLUDE BUTTON)
                           (:PRINT-FUNCTION (LAMBDA (BUTTON STREAM DEPTH)
                                                    (FORMAT STREAM "#<Updated ~A button ~S>"
                                                            (LET ((TYPE (BUTTON-TYPE BUTTON)))
                                                                 (TYPECASE TYPE
                                                                     (BUTTON-TYPE (BUTTON-TYPE-NAME TYPE))
                                                                     (T TYPE)))
                                                            (UPDATED-BUTTON-TEXT-FORM BUTTON)))))
   (TEXT-FORM NIL :TYPE T))

(DEFSTRUCT (MARGINS (:TYPE LIST))
;;; defines the region within a button intended for the text.  We cannot use a region, as buttons may be strechable.
   (LEFT 0 :TYPE INTEGER)
   (BOTTOM 0 :TYPE INTEGER)
   (RIGHT 0 :TYPE INTEGER)
   (TOP 0 :TYPE INTEGER))

(DEFVAR *DEFAULT-BUTTON-SHADOWS* NIL
   "Default for :SHADOWS arg to MAKE-BUTTON.\
Overridden when button type has default shadows.")

(DEFUN MAKE-BUTTON (&REST REST-KEYS &KEY (TYPE *DEFAULT-BUTTON-TYPE*)
                          (TEXT NIL TEXT-PROVIDED)
                          (TEXT-FORM NIL TEXT-FORM-PROVIDED)
                          (SHADOWS NIL SHADOWS-PROVIDED)
                          ACTION HELP FONT INVERTED? &ALLOW-OTHER-KEYS)
;;; make & return a button.  use MAKE-BUTTON-WINDOW to put this button in a window.
   (LET* ((BUTTON-TYPE (OR (IF (BUTTON-TYPE-P TYPE)
                               TYPE)
                           (BUTTON-TYPE-NAMED TYPE)
                           (ERROR "No button type named ~S exists." TYPE)))
          (TEXT (MAKE-TEXT :STRING (IF (AND (NOT TEXT-PROVIDED)
                                            TEXT-FORM-PROVIDED)
                                       (TEXT-FROM-TEXT-FORM TEXT-FORM)
                                       TEXT)
                           :ALIGNMENT :CENTER :FONT (IF FONT
                                                        (IL:FONTCREATE FONT)
                                                        *DEFAULT-TEXT-FONT*)
                           :SHADOWS
                           (IF SHADOWS-PROVIDED
                               SHADOWS
                               ;; default shadows per button type
                               (GETF (BUTTON-TYPE-PROPS BUTTON-TYPE)
                                     :DEFAULT-SHADOWS *DEFAULT-BUTTON-SHADOWS*))))
          (BUTTON (APPLY (IF TEXT-FORM-PROVIDED
                             #'MAKE-UPDATED-BUTTON
                             #'MAKE-BUTTON-INTERNAL)
                         :TYPE BUTTON-TYPE :TEXT TEXT :ACTION ACTION :HELP-STRING HELP :INVERTED? INVERTED?
                         :PROPS (LET ((PROPS (COPY-LIST REST-KEYS)))
                                     (DOLIST (KEYWORD '(:TYPE :TEXT :ACTION :HELP :FONT :SHADOWS :TEXT-FORM
                                                        :INVERTED?))
                                         (REMF PROPS KEYWORD))
                                     PROPS)
                         (WHEN TEXT-FORM-PROVIDED
```

```
                                `(:TEXT-FORM ,TEXT-FORM)))))
          (COMPUTE-BUTTON-TEXT-POSITION BUTTON)
          BUTTON))

(DEFUN COPY-BUTTON (OLD)
   (LET ((NEW (ETYPECASE OLD
                  (UPDATED-BUTTON (COPY-UPDATED-BUTTON OLD))
                  (BUTTON (COPY-BUTTON-INTERNAL OLD)))))
        (SETF (BUTTON-TEXT NEW)
              (COPY-TEXT (BUTTON-TEXT OLD)))
        NEW))

(DEFUN DISPLAY-BUTTON (BUTTON DSP &KEY NO-UPDATE WIDTH HEIGHT)
   (WHEN (AND (NULL NO-UPDATE)
              (OR WIDTH HEIGHT))
          (ERROR "Illegal to pass WIDTH & HEIGHT unless NO-UPDATE specified"))
   (UNLESS NO-UPDATE (UPDATE-BUTTON BUTTON))
   (LET* ((WIDTH (OR WIDTH (BUTTON-WIDTH BUTTON)))
          (HEIGHT (OR HEIGHT (BUTTON-HEIGHT BUTTON)))
          (TYPE (BUTTON-TYPE BUTTON)))
          (WHEN (OR (BUTTON-TYPE-MASK-BITMAP TYPE)
                    (NOT (BUTTON-TYPE-IMAGE-BITMAP TYPE)))
              ;; erase what's in the mask (or if button is transparent)
              (DISPLAY-BUTTON-MASK BUTTON DSP WIDTH HEIGHT))
          ;; paint the image on
          (DISPLAY-BUTTON-IMAGE BUTTON DSP WIDTH HEIGHT)
          (WHEN (BUTTON-%SELECTED? BUTTON)
              ;; rationalize the selection
              (SETF (BUTTON-%SELECTED? BUTTON)
                    NIL)
              (SHADE-BUTTON BUTTON DSP))))

(DEFUN UPDATE-BUTTON (BUTTON DSP)
;;; should really be called BUTTON-NEEDS-REDISPLAY?
   (WHEN (UPDATED-BUTTON-P BUTTON)
       ;; set the text string of WINDOW's BUTTON to the value of its TEXT-FORM.
       (LET ((NEW-TEXT-STRING (TEXT-FROM-TEXT-FORM (UPDATED-BUTTON-TEXT-FORM BUTTON)
                                                   DSP BUTTON)))
            (UNLESS (EQUAL NEW-TEXT-STRING (TEXT-STRING (BUTTON-TEXT BUTTON)))
                ;; optimization: don't bother if string is same
                (SET-BUTTON-TEXT-STRING BUTTON NEW-TEXT-STRING)
                ;; return T if things have changed
                (RETURN-FROM UPDATE-BUTTON T))))
   ;; a null image cache means button needs redisplay
   (NULL (BUTTON-%IMAGE BUTTON)))

(DEFUN SET-BUTTON-TEXT-STRING (BUTTON STRING)
;;; does everything but redisplay
   (SET-TEXT-STRING (BUTTON-TEXT BUTTON)
         STRING)
   (COMPUTE-BUTTON-TEXT-POSITION BUTTON)
   ;; clear caches
   (SETF (BUTTON-%MASK BUTTON)
         NIL)
   (SETF (BUTTON-%IMAGE BUTTON)
         NIL))

(DEFMACRO BUTTON-PROP (BUTTON PROP &OPTIONAL (NEW-VALUE NIL NEW-VALUE-SUPPLIED))
   (IF NEW-VALUE-SUPPLIED
       `(SETF (GETF (BUTTON-PROPS ,BUTTON)
                    ,PROP)
              ,NEW-VALUE)
       `(GETF (BUTTON-PROPS ,BUTTON)
              ,PROP)))

(DEFUN SET-BUTTON-TEXT-STRING (BUTTON STRING)
;;; does everything but redisplay
```

```
   (SET-TEXT-STRING (BUTTON-TEXT BUTTON)
         STRING)
   (COMPUTE-BUTTON-TEXT-POSITION BUTTON)
   ;; clear caches
   (SETF (BUTTON-%MASK BUTTON)
         NIL)
   (SETF (BUTTON-%IMAGE BUTTON)
         NIL))
```

```
(DEFUN COMPUTE-BUTTON-TEXT-POSITION (BUTTON)
   (SETF (TEXT-POSITION (BUTTON-TEXT BUTTON))
         (MAKE-POSITION (BUTTON-TEXT-X-COORD BUTTON)
                (BUTTON-TEXT-Y-COORD BUTTON))))
```

```
(DEFUN BUTTON-TEXT-X-COORD (BUTTON)
   (LET ((TEXT (BUTTON-TEXT BUTTON))
         (MARGINS (BUTTON-TYPE-MARGINS (BUTTON-TYPE BUTTON))))
        (ECASE (TEXT-ALIGNMENT TEXT)
            (:CENTER (+ (MARGINS-LEFT MARGINS)
                        (FLOOR (MAX (TEXT-%WIDTH TEXT)
                                    (- (BUTTON-WIDTH BUTTON)
                                       (MARGINS-LEFT MARGINS)
                                       (MARGINS-RIGHT MARGINS)))
                               2)))
            ((:LEFT-BOTTOM :LEFT-TOP) (MARGINS-LEFT MARGINS))
            ((:RIGHT-BOTTOM :RIGHT-TOP) (MARGINS-RIGHT MARGINS)))))
```

```
(DEFUN BUTTON-TEXT-Y-COORD (BUTTON)
   (LET ((TEXT (BUTTON-TEXT BUTTON))
         (MARGINS (BUTTON-TYPE-MARGINS (BUTTON-TYPE BUTTON))))
        (ECASE (TEXT-ALIGNMENT TEXT)
            (:CENTER (+ (MARGINS-BOTTOM MARGINS)
                        (FLOOR (MAX (TEXT-%HEIGHT TEXT)
                                    (- (BUTTON-HEIGHT BUTTON)
                                       (MARGINS-BOTTOM MARGINS)
                                       (MARGINS-TOP MARGINS)))
                               2)))
            ((:LEFT-BOTTOM :RIGHT-BOTTOM) (MARGINS-BOTTOM MARGINS))
            ((:LEFT-TOP :RIGHT-TOP) (MARGINS-TOP MARGINS)))))
```

```
(DEFUN TEXT-FROM-TEXT-FORM (TEXT-FORM &OPTIONAL DSP BUTTON)
```

;;; return the text string for an updated button in WINDOW.

```
   (TYPECASE TEXT-FORM
       (LIST (EVAL TEXT-FORM))
       ;; note: when an updated button is first created this is called with WINDOW=NIL.  text form functions are required to handle this condition
       ;; gracefully.
       (T (FUNCALL TEXT-FORM DSP BUTTON))))
```

```
(DEFUN BUTTON-TRACK-MOUSE (BUTTON DSP)
```

;;; a mouse key has gone down in BUTTON. watch the mouse with button shaded 'til either the key goes up or the mouse leaves BUTTON. if key went
;;; up then perform button action & return true.

```
   (LET ((REGION (MAKE-REGION :LEFT 0 :BOTTOM 0 :WIDTH (BUTTON-WIDTH BUTTON)
                      :HEIGHT
                      (BUTTON-HEIGHT BUTTON)))
         (TIMER (IL:SETUPTIMER *BUTTON-HELP-DELAY*)))
        (UNWIND-PROTECT
            (PROGN (SHADE-BUTTON BUTTON DSP :REGION REGION)
                   (LOOP (IL:GETMOUSESTATE)
                         (UNLESS (IL:INSIDEP REGION (IL:LASTMOUSEX DSP)
                                         (IL:LASTMOUSEY DSP))
                                 (RETURN))
                         (UNLESS (IL:LASTMOUSESTATE (OR IL:LEFT IL:MIDDLE))
                             (PERFORM-BUTTON-ACTION BUTTON DSP)
                             ;; return true if we performed action
                             (RETURN T))
                         (WHEN (AND TIMER (IL:TIMEREXPIRED? TIMER))
                             (SETQ TIMER NIL)
                             (PRINT-BUTTON-HELP BUTTON))))
            (SHADE-BUTTON BUTTON DSP :REGION REGION :DESELECT T))))
```

```
(DEFUN PERFORM-BUTTON-ACTION (BUTTON DSP)
   (LET ((ACTION (BUTTON-ACTION BUTTON)))
        (TYPECASE ACTION
            (LIST (EVAL ACTION))
```

```
            (T (FUNCALL ACTION DSP BUTTON)))))

(DEFUN EDIT-BUTTON (BUTTON)
   (IL:ALLOW.BUTTON.EVENTS)
   (LET* ((EXTERNAL-FORM (EXTERNALIZE-BUTTON BUTTON T))
          (COPY (COPY-TREE EXTERNAL-FORM))
          (EDITED (WITH-PROFILE (FIND-PROFILE "XCL")
                          (IL:EDITE EXTERNAL-FORM NIL (TEXT-STRING (BUTTON-TEXT BUTTON))
                                 NIL NIL :CLOSE-ON-COMPLETION))))
         (IF (EQUAL EDITED COPY)
             BUTTON
             (APPLY #'MAKE-BUTTON EDITED))))

(DEFUN BUTTON-COPY-SELECTED (BUTTON)
   (IF (FBOUNDP 'MAKE-BIO)
       ;; if ROOMS-BIO is loaded
       (LET* ((DESTINATION (IL:WFROMDS (IL:PROCESS.TTY (IL:TTY.PROCESS))))
              (COPYINSERTFN (AND DESTINATION (IL:WINDOWPROP DESTINATION 'IL:COPYINSERTFN))))
              ;; fake IL:COPYINSERT, but instead of punting to IL:BKSYSBUF punt to copying the window
              (IF COPYINSERTFN
                  (FUNCALL COPYINSERTFN (MAKE-BIO (COPY-BUTTON BUTTON))
                         DESTINATION)
                  (MAKE-BUTTON-WINDOW (COPY-BUTTON BUTTON))))
       (MAKE-BUTTON-WINDOW (COPY-BUTTON BUTTON))))

(DEFUN SHADE-BUTTON (BUTTON DSP &KEY (REGION (MAKE-REGION :LEFT 0 :BOTTOM 0 :WIDTH (BUTTON-WIDTH BUTTON)
                                                          :HEIGHT
                                                          (BUTTON-HEIGHT BUTTON)))
                                 DESELECT)
;;; called when mouse key down in BUTTON.
   ;; DESELECT? tells the intention of the call.
   ;; see also DISPLAY-BUTTON
   (LET ((MASK (BUTTON-%MASK BUTTON))
         (SELECTED? (BUTTON-%SELECTED? BUTTON)))
        (WHEN (EQ DESELECT SELECTED?)
            ;; invert MASK with *BUTTON-SELECTION-SHADE*
            (IL:BITBLT MASK NIL NIL DSP 0 0 (REGION-WIDTH REGION)
                   (REGION-HEIGHT REGION)
                   (IF (NULL MASK)
                       'IL:TEXTURE
                       'IL:MERGE)
                   'IL:INVERT *BUTTON-SELECTION-SHADE*)
            ;; toggle SELECTED? bit
            (SETF (BUTTON-%SELECTED? BUTTON)
                  (NOT SELECTED?)))))

(DEFUN PRINT-BUTTON-HELP (BUTTON)
   (NOTIFY-USER (OR (BUTTON-HELP-STRING BUTTON)
                    "No help provided for this button.")))

;; button windows

(DEFGLOBALVAR *BUTTON-HELP-DELAY* IL:MENUHELDWAIT)

(DEFPARAMETER *BUTTON-SELECTION-SHADE* 32768)

(DEFUN MAKE-BUTTON-WINDOW (BUTTON &OPTIONAL POSITION)
   (LET* ((WIDTH (BUTTON-WIDTH BUTTON))
          (HEIGHT (BUTTON-HEIGHT BUTTON))
          (POSITION (OR (IL:POSITIONP POSITION)
                        (IL:GETBOXPOSITION WIDTH HEIGHT)))
          (WINDOW (IL:CREATEW (IL:CREATEREGION (POSITION-X POSITION)
                                               (POSITION-Y POSITION)
                                               WIDTH HEIGHT)
                              NIL 0)))
         (IL:WINDOWPROP WINDOW 'BUTTON BUTTON)
         (IL:WINDOWPROP WINDOW 'IL:BUTTONEVENTFN 'BW-BUTTONEVENTFN)
         (IL:WINDOWPROP WINDOW 'IL:AFTERMOVEFN 'BW-REPAINTFN)
         (IL:WINDOWPROP WINDOW 'IL:OPENFN 'BW-REPAINTFN)
         (IL:WINDOWPROP WINDOW 'IL:TOTOPFN 'BW-TOTOPFN)
         (IL:WINDOWPROP WINDOW 'IL:REPAINTFN 'BW-REPAINTFN)
         (IL:WINDOWPROP WINDOW 'IL:RESHAPEFN 'IL:DON\'T)
         (IL:WINDOWPROP WINDOW 'IL:SHRINKFN 'IL:DON\'T)
```

```
        (WHEN (BUTTON-PROP BUTTON :PROTECTED?)
            (IL:WINDOWPROP WINDOW 'IL:RIGHTBUTTONFN 'IL:TOTOPW))
        (BW-REPAINTFN WINDOW)
        WINDOW))


(DEFUN BW-REPAINTFN (WINDOW &REST REST &KEY NO-UPDATE)
   (DECLARE (IGNORE REST))
   (IL:TOTOPW WINDOW T)
   (LET* ((BUTTON (IL:WINDOWPROP WINDOW 'BUTTON))
          (DSP (IL:WINDOWPROP WINDOW 'IL:DSP))
          (TYPE (BUTTON-TYPE BUTTON)))
        (UNLESS NO-UPDATE
            (WHEN (UPDATED-BUTTON-P BUTTON)
                  (UPDATE-BUTTON BUTTON)))
        (LET ((WIDTH (BUTTON-WIDTH BUTTON))
              (HEIGHT (BUTTON-HEIGHT BUTTON)))
             (MAYBE-RESIZE-BUTTON-WINDOW WINDOW BUTTON WIDTH HEIGHT)
             (IF (AND (BUTTON-TYPE-IMAGE-BITMAP TYPE)
                      (NOT (BUTTON-TYPE-MASK-BITMAP TYPE)))
                 ;; OK to clear - don't care what's behind
                 (IL:CLEARW WINDOW)
                 ;; copy what's behind the window through
                 (IL:BITBLT (IL:WINDOWPROP WINDOW 'IL:IMAGECOVERED)
                            0 0 DSP 0 0 WIDTH HEIGHT 'IL:INPUT 'IL:REPLACE))
             (DISPLAY-BUTTON BUTTON DSP :NO-UPDATE T :WIDTH WIDTH :HEIGHT HEIGHT))))


(DEFUN BW-TOTOPFN (WINDOW)
   ;; called when window is un-hidden or brought to top
   (LET ((BUTTON (IL:WINDOWPROP WINDOW 'BUTTON)))
        (WHEN (BUTTON-P BUTTON)
            (WHEN (OR ;; needs redisplay because of update
                      (UPDATE-BUTTON BUTTON)
                      ;; or it has a mask & needs background copied through
                      (BUTTON-TYPE-MASK-BITMAP (BUTTON-TYPE BUTTON))
                      ;; or it has no mask and no image, i.e. it's transparent & needs background copied through.
                      (NULL (BUTTON-TYPE-IMAGE-BITMAP (BUTTON-TYPE BUTTON))))
                 (BW-REPAINTFN WINDOW :NO-UPDATE T)))))


(DEFUN BW-BUTTONEVENTFN (WINDOW)
   (LET ((BUTTON (IL:WINDOWPROP WINDOW 'BUTTON)))
        (IF (IL:MOUSESTATE IL:MIDDLE)
            (COND
               ((BUTTON-PROP BUTTON :PROTECTED?)
                (BW-BUTTONEVENTFN-INTERNAL BUTTON WINDOW))
               ((EDIT-KEY-DOWN-P)
                (EDIT-BUTTON-WINDOW BUTTON WINDOW))
               ((COPY-KEY-DOWN-P)
                (BUTTON-COPY-SELECTED BUTTON))
               ((MOVE-KEY-DOWN-P)
                (IL:MOVEW WINDOW))
               ((DELETE-KEY-DOWN-P)
                (IF (FBOUNDP 'INTERACTIVE-CLOSE-WINDOW)
                    (INTERACTIVE-CLOSE-WINDOW WINDOW)
                    (CLOSE-WINDOW WINDOW)))
               ((HELP-KEY-DOWN-P)
                (PRINT-BUTTON-HELP BUTTON))
               (T (BW-BUTTONEVENTFN-INTERNAL BUTTON WINDOW)))
            (BW-BUTTONEVENTFN-INTERNAL BUTTON WINDOW))))


(DEFUN BW-BUTTONEVENTFN-INTERNAL (WINDOW BUTTON)
   (LET ((WINDOW WINDOW)
         (BUTTON BUTTON))
        (LOOP (WHEN (BUTTON-P BUTTON)
                    (IL:TOTOPW WINDOW)
                    (WHEN (BUTTON-TRACK-MOUSE BUTTON WINDOW)
                          (WHEN (UPDATE-BUTTON BUTTON)
                                ;; button's action caused it to need redisplay
                                (BW-REPAINTFN WINDOW :NO-UPDATE T))
                          (RETURN)))
              (UNLESS (IL:MOUSESTATE (OR IL:LEFT IL:MIDDLE))
                      (RETURN))
              (SETQ WINDOW (IL:WHICHW))
              (SETQ BUTTON (WHEN WINDOW
                                 (IL:WINDOWPROP WINDOW 'BUTTON))))))
```

```
(DEFUN SET-BUTTON-WINDOW-TEXT-STRING (WINDOW STRING)

;;; note: this does everything but the redisplay.

   (LET ((BUTTON (IL:WINDOWPROP WINDOW 'BUTTON)))
        (SET-BUTTON-TEXT-STRING BUTTON STRING)
        (MAYBE-RESIZE-BUTTON-WINDOW WINDOW BUTTON)))


(DEFUN MAYBE-RESIZE-BUTTON-WINDOW (WINDOW BUTTON &OPTIONAL (WIDTH (BUTTON-WIDTH BUTTON))
                                                           (HEIGHT (BUTTON-HEIGHT BUTTON)))
   (LET ((OLD-REGION (WINDOW-REGION WINDOW)))
        (UNLESS (AND (= WIDTH (REGION-WIDTH OLD-REGION))
                     (= HEIGHT (REGION-HEIGHT OLD-REGION)))
            (UNWIND-PROTECT
                (PROGN (IL:TOTOPW WINDOW T)
                       (IL:WINDOWPROP WINDOW 'IL:RESHAPEFN 'IL:NILL)
                       (IL:SHAPEW1 WINDOW (MAKE-REGION :LEFT (REGION-LEFT OLD-REGION)
                                                       :BOTTOM
                                                       (REGION-BOTTOM OLD-REGION)
                                                       :WIDTH WIDTH :HEIGHT HEIGHT))

                       ;; return true if we shaped

                       T)
                (IL:WINDOWPROP WINDOW 'IL:RESHAPEFN 'IL:DON\'T)))))


(DEFUN BW-SCREEN-CHANGED-FUNCTION ()
   (LET ((OLD-DEFAULT-FONT *DEFAULT-TEXT-FONT*)
         (NEW-DEFAULT-FONT (SET-DEFAULT-TEXT-FONT)))
        (UNLESS (EQ OLD-DEFAULT-FONT NEW-DEFAULT-FONT)
            (DOLIST (WINDOW (ALL-WINDOWS T))
                (LET ((BUTTON (IL:WINDOWPROP WINDOW 'BUTTON)))
                     (WHEN (AND (BUTTON-P BUTTON)
                                (EQ OLD-DEFAULT-FONT (TEXT-FONT (BUTTON-TEXT BUTTON))))

                         ;; upgrade buttons with default font

                         (SETF (TEXT-FONT (BUTTON-TEXT BUTTON))
                               NEW-DEFAULT-FONT)
                         (UPDATE-TEXT-CACHES (BUTTON-TEXT BUTTON))
                         (COMPUTE-BUTTON-TEXT-POSITION BUTTON)

                         ;; force redisplay

                         (SETF (BUTTON-%IMAGE BUTTON)
                               NIL)
                         (SETF (BUTTON-%MASK BUTTON)
                               NIL)))))))


(DEFGLOBALVAR *SCREEN-CHANGED-FUNCTIONS* (LIST '%INTERNALIZE-ALL-PLACEMENTS))

(PUSHNEW 'BW-SCREEN-CHANGED-FUNCTION *SCREEN-CHANGED-FUNCTIONS*)

;; button bitmaps


(DEFSTRUCT (NORTH-SOUTH-BITMAP (:CONC-NAME "NS-BITMAP-"))
   NORTH
   CENTER
   SOUTH)


(DEFSTRUCT (EAST-WEST-BITMAP (:CONC-NAME "EW-BITMAP-"))
   EAST
   CENTER
   WEST)


(DEFSTRUCT NSEW-BITMAP
   NORTH
   NW
   NE
   SOUTH
   SW
   SE
   EAST
   CENTER
   WEST)


(DEFUN DISPLAY-BUTTON-IMAGE (BUTTON DSP WIDTH HEIGHT)
   (LET ((CACHED-IMAGE (BUTTON-%IMAGE BUTTON))
         (INVERTED? (BUTTON-INVERTED? BUTTON))
         (MASK? (BUTTON-%MASK BUTTON)))
        (UNLESS CACHED-IMAGE
            (SETQ CACHED-IMAGE (IL:BITMAPCREATE WIDTH HEIGHT))
            (LET ((TYPE-IMAGE (BUTTON-TYPE-IMAGE-BITMAP (BUTTON-TYPE BUTTON))))
```

```
                (WHEN TYPE-IMAGE (BUTTON-BITMAP-BITBLT TYPE-IMAGE CACHED-IMAGE WIDTH HEIGHT)))
            (DISPLAY-TEXT (BUTTON-TEXT BUTTON)
                   CACHED-IMAGE)
            (SETF (BUTTON-%IMAGE BUTTON)
                  CACHED-IMAGE))
        (IL:BITBLT CACHED-IMAGE 0 0 DSP 0 0 WIDTH HEIGHT (IF (AND INVERTED? (NOT MASK?))
                                                             'IL:INVERT
                                                             'IL:SOURCE)
               (IF (AND INVERTED? MASK?)
                   'IL:INVERT
                   'IL:PAINT))))
```

```
(DEFUN DISPLAY-BUTTON-MASK (BUTTON DSP WIDTH HEIGHT)
   (LET ((CACHED-MASK (BUTTON-%MASK BUTTON)))
        (UNLESS CACHED-MASK
            (SETQ CACHED-MASK (IL:BITMAPCREATE WIDTH HEIGHT))
            (LET ((TYPE-MASK (BUTTON-TYPE-MASK-BITMAP (BUTTON-TYPE BUTTON))))
                 (WHEN TYPE-MASK (BUTTON-BITMAP-BITBLT TYPE-MASK CACHED-MASK WIDTH HEIGHT)))
            (DISPLAY-TEXT (BUTTON-TEXT BUTTON)
                   CACHED-MASK :MASK-ONLY T)
            (SETF (BUTTON-%MASK BUTTON)
                  CACHED-MASK))
        (IL:BITBLT CACHED-MASK 0 0 DSP 0 0 WIDTH HEIGHT 'IL:SOURCE (IF (BUTTON-INVERTED? BUTTON)
                                                                       'IL:PAINT
                                                                       'IL:ERASE))))
```

```
(DEFUN BUTTON-WIDTH (BUTTON)
   (LET* ((BUTTON-TYPE (BUTTON-TYPE BUTTON))
          (MARGINS (BUTTON-TYPE-MARGINS BUTTON-TYPE))
          (BITMAP (BUTTON-TYPE-IMAGE-BITMAP BUTTON-TYPE))
          (TEXT-WIDTH (TEXT-%WIDTH (BUTTON-TEXT BUTTON))))
         (ETYPECASE BITMAP
             (BITMAP (IL:BITMAPWIDTH BITMAP))
             (NULL TEXT-WIDTH)
             (NORTH-SOUTH-BITMAP (IL:BITMAPWIDTH (NS-BITMAP-NORTH BITMAP)))
             ((OR NSEW-BITMAP EAST-WEST-BITMAP) (LET* ((WIDTH (+ TEXT-WIDTH (MARGINS-LEFT MARGINS)
                                                                 (MARGINS-RIGHT MARGINS)))
                                                       (EAST-WIDTH (IL:BITMAPWIDTH (TYPECASE BITMAP
                                                                                     (NSEW-BITMAP
                                                                                        (NSEW-BITMAP-EAST
                                                                                         BITMAP))
                                                                                     (EAST-WEST-BITMAP
                                                                                        (EW-BITMAP-EAST BITMAP
                                                                                              )))))
                                                       (CENTER-WIDTH (IL:BITMAPWIDTH (TYPECASE BITMAP
                                                                                       (NSEW-BITMAP
                                                                                          (NSEW-BITMAP-CENTER
                                                                                           BITMAP))
                                                                                       (EAST-WEST-BITMAP
                                                                                          (EW-BITMAP-CENTER
                                                                                           BITMAP)))))
                                                       (WEST-WIDTH (IL:BITMAPWIDTH (TYPECASE BITMAP
                                                                                     (NSEW-BITMAP
                                                                                        (NSEW-BITMAP-WEST
                                                                                         BITMAP))
                                                                                     (EAST-WEST-BITMAP
                                                                                        (EW-BITMAP-WEST BITMAP
                                                                                              ))))))
                                                 ;; we could use WIDTH directly but we'd rather tile in an even number of CENTER bitmaps, in case
                                                 ;; it's a pattern that needs to blend with the EAST and WEST.
                                                 (MAX (+ WIDTH (- CENTER-WIDTH (MOD (- WIDTH EAST-WIDTH
                                                                                       WEST-WIDTH)
                                                                                    CENTER-WIDTH)))
                                                      (+ EAST-WIDTH WEST-WIDTH)))))))
```

```
(DEFUN BUTTON-HEIGHT (BUTTON)
   (LET* ((BUTTON-TYPE (BUTTON-TYPE BUTTON))
          (MARGINS (BUTTON-TYPE-MARGINS BUTTON-TYPE))
          (BITMAP (BUTTON-TYPE-IMAGE-BITMAP BUTTON-TYPE))
          (TEXT-HEIGHT (TEXT-%HEIGHT (BUTTON-TEXT BUTTON))))
         (ETYPECASE BITMAP
             (BITMAP (IL:BITMAPHEIGHT BITMAP))
             (NULL TEXT-HEIGHT)
             (EAST-WEST-BITMAP (IL:BITMAPHEIGHT (EW-BITMAP-EAST BITMAP)))
             ((OR NSEW-BITMAP NORTH-SOUTH-BITMAP) (LET* ((HEIGHT (+ TEXT-HEIGHT (MARGINS-BOTTOM MARGINS)
                                                                    (MARGINS-TOP MARGINS)))
                                                         (NORTH-HEIGHT (IL:BITMAPHEIGHT
                                                                        (TYPECASE BITMAP
                                                                            (NSEW-BITMAP (NSEW-BITMAP-NORTH
                                                                                          BITMAP))
                                                                            (NORTH-SOUTH-BITMAP (NS-BITMAP-NORTH
                                                                                                 BITMAP)))))
                                                         (CENTER-HEIGHT (IL:BITMAPHEIGHT
```

```
                                                    (TYPECASE BITMAP
                                                        (NSEW-BITMAP (NSEW-BITMAP-CENTER
                                                                      BITMAP))
                                                        (NORTH-SOUTH-BITMAP (
                                                                             NS-BITMAP-CENTER
                                                                              BITMAP)))))
                                  (SOUTH-HEIGHT (IL:BITMAPHEIGHT
                                                 (TYPECASE BITMAP
                                                     (NSEW-BITMAP (NSEW-BITMAP-SOUTH
                                                                   BITMAP))
                                                     (NORTH-SOUTH-BITMAP (NS-BITMAP-SOUTH
                                                                          BITMAP))))))
                        ;; we could use HEIGHT directly but we'd rather tile in an even number of CENTER bitmaps, in case
                        ;; it's a pattern that needs to blend with the EAST and WEST.
                                  (MAX (+ HEIGHT (- CENTER-HEIGHT
                                                    (MOD (- HEIGHT NORTH-HEIGHT
                                                            SOUTH-HEIGHT)
                                                         CENTER-HEIGHT)))
                                       (+ NORTH-HEIGHT SOUTH-HEIGHT)))))))
```

```
(DEFUN BUTTON-BITMAP-BITBLT (BITMAP DESTINATION WIDTH HEIGHT)
   (ETYPECASE BITMAP
       (BITMAP (IL:BITBLT BITMAP 0 0 DESTINATION 0 0 WIDTH HEIGHT))
       (EAST-WEST-BITMAP (EW-BITBLT (EW-BITMAP-WEST BITMAP)
                                    (EW-BITMAP-CENTER BITMAP)
                                    (EW-BITMAP-EAST BITMAP)
                                    DESTINATION WIDTH 0))
       (NORTH-SOUTH-BITMAP (NS-BITBLT (NS-BITMAP-SOUTH BITMAP)
                                      (NS-BITMAP-CENTER BITMAP)
                                      (NS-BITMAP-NORTH BITMAP)
                                      DESTINATION HEIGHT 0))
       (NSEW-BITMAP (NSEW-BITBLT BITMAP DESTINATION WIDTH HEIGHT))))
```

```
(DEFUN EW-BITBLT (WEST CENTER EAST DESTINATION WIDTH BOTTOM)
   (LET* ((WEST-WIDTH (IL:BITMAPWIDTH WEST))
          (CENTER-WIDTH (IL:BITMAPWIDTH CENTER))
          (EAST-WIDTH (IL:BITMAPWIDTH EAST))
          (EAST-LEFT (- WIDTH EAST-WIDTH))
          (HEIGHT (IL:BITMAPHEIGHT CENTER)))
         ;; blt the west bitmap down the left
         (IL:BITBLT WEST 0 0 DESTINATION 0 BOTTOM WEST-WIDTH HEIGHT)
         (WHEN (> EAST-LEFT WEST-WIDTH)
             ;; blt in one copy of center
             (IL:BITBLT CENTER 0 0 DESTINATION WEST-WIDTH BOTTOM CENTER-WIDTH HEIGHT)
             (DO* ((WIDTH CENTER-WIDTH (+ WIDTH WIDTH))
                   (LEFT (+ WEST-WIDTH WIDTH)
                         (+ WEST-WIDTH WIDTH)))
                  ((>= LEFT EAST-LEFT))
                 ;; blt the center bitmap across the middle
                 (IL:BITBLT DESTINATION WEST-WIDTH BOTTOM DESTINATION LEFT BOTTOM (MIN WIDTH (- EAST-LEFT LEFT))
                        HEIGHT)))
         ;; blt the east bitmap on the right end
         (IL:BITBLT EAST 0 0 DESTINATION EAST-LEFT BOTTOM EAST-WIDTH HEIGHT)))
```

```
(DEFUN NS-BITBLT (SOUTH CENTER NORTH DESTINATION HEIGHT LEFT &OPTIONAL (DO-ENDS? T))
   (LET* ((SOUTH-HEIGHT (IL:BITMAPHEIGHT SOUTH))
          (CENTER-HEIGHT (IL:BITMAPHEIGHT CENTER))
          (NORTH-HEIGHT (IL:BITMAPHEIGHT NORTH))
          (NORTH-BOTTOM (- HEIGHT NORTH-HEIGHT))
          (WIDTH (IL:BITMAPWIDTH CENTER)))
         (WHEN DO-ENDS?
             ;; blt the south bitmap across the bottom
             (IL:BITBLT SOUTH 0 0 DESTINATION LEFT 0 WIDTH SOUTH-HEIGHT))
         (WHEN (> NORTH-BOTTOM SOUTH-HEIGHT)
             ;; blt in one copy of center
             (IL:BITBLT CENTER 0 0 DESTINATION LEFT SOUTH-HEIGHT WIDTH CENTER-HEIGHT)
             (DO* ((HEIGHT CENTER-HEIGHT (+ HEIGHT HEIGHT))
                   (BOTTOM (+ SOUTH-HEIGHT HEIGHT)
                           (+ SOUTH-HEIGHT HEIGHT)))
                  ((>= BOTTOM NORTH-BOTTOM))
                 ;; blt the center bitmap up the middle
                 (IL:BITBLT DESTINATION LEFT SOUTH-HEIGHT DESTINATION LEFT BOTTOM WIDTH (MIN HEIGHT
                                                                                            (- NORTH-BOTTOM
                                                                                               BOTTOM)))))
         (WHEN DO-ENDS?
             ;; blt the north bitmap across the top
```

```
            (IL:BITBLT NORTH 0 0 DESTINATION LEFT NORTH-BOTTOM WIDTH NORTH-HEIGHT))))
```

```
(DEFUN NSEW-BITBLT (NSEW-BITMAP DESTINATION WIDTH HEIGHT)
   (LET* ((SW (NSEW-BITMAP-SW NSEW-BITMAP))
          (SE (NSEW-BITMAP-SE NSEW-BITMAP))
          (NW (NSEW-BITMAP-NW NSEW-BITMAP))
          (NE (NSEW-BITMAP-NE NSEW-BITMAP))
          (NORTH-BOTTOM (- HEIGHT (IL:BITMAPHEIGHT NW)))
          (EAST-LEFT (- WIDTH (IL:BITMAPWIDTH SE))))
         ;; across the bottom
         (EW-BITBLT SW (NSEW-BITMAP-SOUTH NSEW-BITMAP)
                SE DESTINATION WIDTH 0)
         ;; across the top
         (EW-BITBLT NW (NSEW-BITMAP-NORTH NSEW-BITMAP)
                NE DESTINATION WIDTH NORTH-BOTTOM)
         ;; up the left
         (NS-BITBLT SW (NSEW-BITMAP-WEST NSEW-BITMAP)
                NW DESTINATION HEIGHT 0 NIL)
         ;; up the right
         (NS-BITBLT SE (NSEW-BITMAP-EAST NSEW-BITMAP)
                NE DESTINATION HEIGHT EAST-LEFT NIL)
         ;; tile the center
         (PAINT-REGION DESTINATION (LET ((LEFT (IL:BITMAPWIDTH SW))
                                         (BOTTOM (IL:BITMAPHEIGHT SW)))
                                        (MAKE-REGION :LEFT LEFT :BOTTOM BOTTOM :WIDTH (- EAST-LEFT LEFT)
                                               :HEIGHT
                                               (- NORTH-BOTTOM BOTTOM)))
                (NSEW-BITMAP-CENTER NSEW-BITMAP))))
```

```
(DEFUN PAINT-REGION (DESTINATION REGION SHADE &OPTIONAL CLIPPING-REGION)
   ;; fill REGION of DESTINATION with SHADE
   (TYPECASE SHADE
       (BITMAP
          ;; tile the bitmap within REGION
          (LET* ((REGION-LEFT (REGION-LEFT REGION))
                 (REGION-BOTTOM (REGION-BOTTOM REGION))
                 (REGION-WIDTH (REGION-WIDTH REGION))
                 (REGION-HEIGHT (REGION-HEIGHT REGION))
                 (BITMAP-WIDTH (IL:BITMAPWIDTH SHADE))
                 (BITMAP-HEIGHT (IL:BITMAPHEIGHT SHADE))
                 (REGION-RIGHT (+ REGION-LEFT REGION-WIDTH))
                 (REGION-TOP (+ REGION-BOTTOM REGION-HEIGHT))
                 (CLIPPING-REGION (IF CLIPPING-REGION
                                      (IL:INTERSECTREGIONS CLIPPING-REGION REGION)
                                      REGION)))
                ;; blt in one copy in lower left corner
                (IL:BITBLT SHADE 0 0 DESTINATION REGION-LEFT REGION-BOTTOM BITMAP-WIDTH BITMAP-HEIGHT NIL NIL
                       NIL CLIPPING-REGION)
                ;; blt across bottom, doubling size each time
                (LET ((LEFT BITMAP-WIDTH))
                     (LOOP (WHEN (>= LEFT REGION-RIGHT)
                                 (RETURN))
                           (IL:BITBLT DESTINATION REGION-LEFT REGION-BOTTOM DESTINATION (+ LEFT REGION-LEFT)
                                  REGION-BOTTOM LEFT BITMAP-HEIGHT NIL NIL NIL CLIPPING-REGION)
                           (SETF LEFT (+ LEFT LEFT))))
                ;; blt up, doubling size each time
                (LET ((BOTTOM BITMAP-HEIGHT))
                     (LOOP (WHEN (>= BOTTOM REGION-TOP)
                                 (RETURN))
                           (IL:BITBLT DESTINATION REGION-LEFT REGION-BOTTOM DESTINATION REGION-LEFT
                                  (+ REGION-BOTTOM BOTTOM)
                                  REGION-WIDTH BOTTOM NIL NIL NIL CLIPPING-REGION)
                           (SETF BOTTOM (+ BOTTOM BOTTOM))))))
       (TEXTURE
          ;; squirt the texture onto the screen within REGION
          (IL:BLTSHADE SHADE DESTINATION (REGION-LEFT REGION)
                 (REGION-BOTTOM REGION)
                 (REGION-WIDTH REGION)
                 (REGION-HEIGHT REGION)
                 NIL CLIPPING-REGION))))
```

;; externalization

```
(DEFUN EDIT-BUTTON-WINDOW (BUTTON WINDOW)
   (UNLESS (IL:WINDOWPROP WINDOW 'BUTTON-BEING-EDITED)
       (UNWIND-PROTECT
           (PROGN (IL:WINDOWPROP WINDOW 'BUTTON-BEING-EDITED T)
                  (LET ((NEW-BUTTON (EDIT-BUTTON BUTTON)))
                       (UNLESS (EQ BUTTON NEW-BUTTON)
                           (IL:WINDOWPROP WINDOW 'BUTTON NEW-BUTTON)
                           (BW-REPAINTFN WINDOW))))
           (IL:REMWINDOWPROP WINDOW 'BUTTON-BEING-EDITED))))
```

```
(DEFUN EXTERNALIZE-BUTTON (BUTTON &OPTIONAL VERBOSE)
```

;;; returns a property list to which MAKE-BUTTON can be applied

```
   (LET* ((TEXT (BUTTON-TEXT BUTTON))
          (TYPE (BUTTON-TYPE BUTTON))
          (TYPE-NAME (BUTTON-TYPE-NAME TYPE))
          (SHADOWS (TEXT-SHADOWS TEXT))
          (FONT (TEXT-FONT TEXT))
          (INVERTED? (BUTTON-INVERTED? BUTTON)))
         `(,@(ETYPECASE BUTTON
                (UPDATED-BUTTON `(:TEXT-FORM ,(UPDATED-BUTTON-TEXT-FORM BUTTON)))
                (BUTTON `(:TEXT ,(TEXT-STRING TEXT))))
           :ACTION
           ,(COPY-TREE (BUTTON-ACTION BUTTON))
           :HELP
           ,(BUTTON-HELP-STRING BUTTON)
           ,@(WHEN (OR VERBOSE (NOT (EQ FONT *DEFAULT-TEXT-FONT*)))
                 (LIST :FONT (EXTERNALIZE-FONT FONT)))
           ,@(WHEN (OR VERBOSE (NOT (EQUAL SHADOWS (GETF (BUTTON-TYPE-PROPS TYPE)
                                                         :DEFAULT-SHADOWS *DEFAULT-BUTTON-SHADOWS*))))
                 (LIST :SHADOWS (EXTERNALIZE-TEXT-SHADOWS SHADOWS)))
           ,@(WHEN (OR (NULL TYPE-NAME)
                       VERBOSE
                       (NOT (EQUAL TYPE-NAME *DEFAULT-BUTTON-TYPE*)))
                 (LIST :TYPE (IF (NULL TYPE-NAME)
                                 TYPE
                                 TYPE-NAME)))
           ,@(WHEN (OR VERBOSE INVERTED?)
                   (LIST :INVERTED? INVERTED?))
           ,@(COPY-TREE (BUTTON-PROPS BUTTON)))))
```

```
(DEFUN EXTERNALIZE-FONT (FONT)
   (LIST (IL:FONTPROP FONT 'IL:FAMILY)
         (IL:FONTPROP FONT 'IL:SIZE)
         (IL:FONTPROP FONT 'IL:FACE)))
```

```
(DEFUN WITH-BUTTON (ACTION TEXT HELP)
   (IF (COPY-KEY-DOWN-P)
       (PROG1 NIL
           (MAKE-BUTTON-WINDOW (MAKE-BUTTON :TYPE *DEFAULT-BUTTON-TYPE* :TEXT TEXT :HELP HELP :ACTION ACTION
                                            )
                   TEXT HELP))
       (EVAL ACTION)))
```

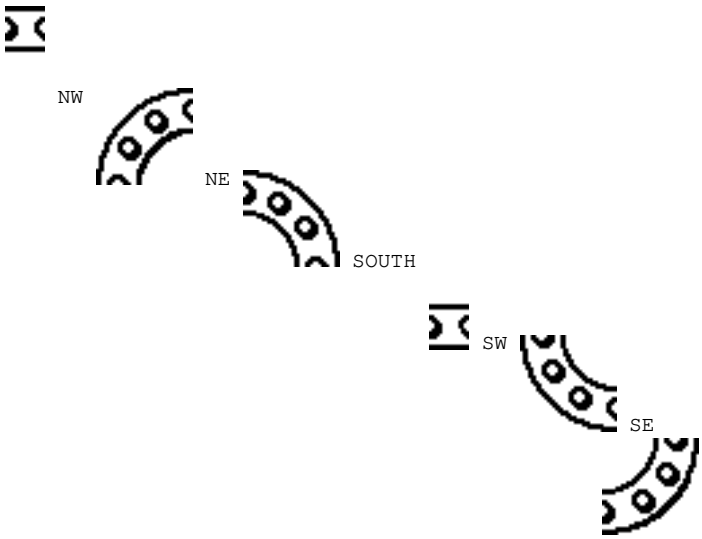
```
(DEF-BUTTON-TYPE :DOOR :IMAGE
```

```
   :MASK NIL
   :MARGINS (2 18 3 2)
   :DEFAULT-SHADOWS NIL)
```

```
(DEF-BUTTON-TYPE :SHADOWED :IMAGE
   #S(NSEW-BITMAP NORTH ▪ NW ▗ NE ▝ SOUTH ▗ SW ▝ SE ▚ EAST ▗ CENTER  WEST ▗)
   :MASK #S(NSEW-BITMAP NORTH ▮ NW ▟ NE ▙ SOUTH ▗ SW ▝ SE ▚ EAST ▗ CENTER ▗ WEST ▗)
   :MARGINS (3 5 7 3))
```

```
(DEF-BUTTON-TYPE :TRANSPARENT :IMAGE NIL
   :MASK NIL
   :MARGINS (0 0 0 0)
```

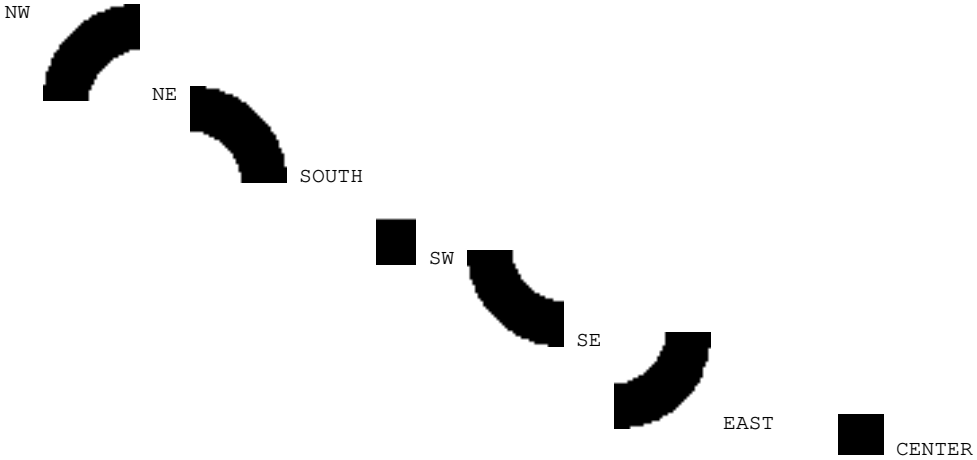
```
   :DEFAULT-SHADOWS T)

(DEF-BUTTON-TYPE :PORTHOLE :IMAGE #S(NSEW-BITMAP NORTH
```




```
EAST
```

```
CENTER
WEST
```

```
   :MASK #S(NSEW-BITMAP NORTH
```




```
WEST
```

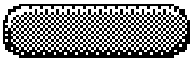
```
   :MARGINS (17 17 17 17)
   :DEFAULT-SHADOWS T)

(DEF-BUTTON-TYPE :ARK :IMAGE
   #S(NORTH-SOUTH-BITMAP NORTH
```

```
CENTER
```



```
SOUTH
```

```
)
   :MARGINS (4 5 5 6)
   :DEFAULT-SHADOWS :ARK)

(DEF-BUTTON-TYPE :ROUND-ARK :IMAGE
```



```
   :MASK
```

```
   :MARGINS (5 4 5 2)
   :DEFAULT-SHADOWS :ARK)

(DEF-BUTTON-TYPE :STRETCHY-ARK :IMAGE
   #S(NSEW-BITMAP NORTH
```

```
NW
```



```
NE
```



```
SOUTH
```



```
SW
```



```
SE
```



```
EAST
```



```
CENTER
```



```
WEST
```



```
)
   :MARGINS (6 6 6 6)
   :DEFAULT-SHADOWS :ARK)
```

```
(DEF-BUTTON-TYPE :STRETCHY-ROUND-ARK :IMAGE
   #S(NSEW-BITMAP NORTH ▒ NW ▒ NE ▒ SOUTH ▒ SW ▒ SE ▒ EAST ▒ CENTER ▒ WEST ▒)

   :MASK #S(NSEW-BITMAP NORTH ▒ NW ▒ NE ▒ SOUTH ▒ SW ▒ SE ▒ EAST ▒ CENTER ▒ WEST ▒)

   :MARGINS (4 1 4 2)
   :DEFAULT-SHADOWS :ARK)

(IL:DECLARE\: IL:DOEVAL@COMPILE IL:DONTCOPY

(IL:GLOBALVARS IL:MENUHELDWAIT)
)

(IL:PUTPROPS IL:ROOMS-BUTTONS IL:COPYRIGHT ("Venue & Xerox Corporation" 1987 1988 1990 2020))
```

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