

File created: 23-Jun-93 20:39:54 {DSK}<python>release>loops>2.0>library-src>LOTSMAP.;1

changes to: (VARS LOTSMAPCOMS)
(FNS MAP-EQUAL)

previous date: 14-Jun-93 14:27:03 {DSK}<users>sybalsky>lots>phase-2>LOTSMAP.;21

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(RPAQQ LOTSMAPCOMS

```
((COMS (RECORDS MAPMARK)  
(FNS MAPMARK-REMOVE MAPMARK-PLACE MAPMARK-UNPLACE MAKE-MAPMARK MAPW-DISPLAY-MARK)  
(FNS MAPMARKS-UPDATEY MAPMARKS-UPDATEX))
```

;;; This file implements map windows for LOTS.

```
(COMS ;; The map/map window itself  
(RECORDS MAP)  
(BITMAPS MAPW-ICON-IMAGE MAPW-ICON-MASK)  
(CONSTANTS (MAP-SIDE-BEARING 50)  
(MAP-BOTTOM-BEARING 60)  
(MAP-TOP-BEARING 30)  
(MAP-2SIDE-BEARING 100)  
(MAP-2BOTTOM-BEARING 90))  
(FNS MAP-CREATE)  
;; Creation and basic window operations  
(FNS MAPW-CREATE MAPW-P MAP-EQUAL MAPW-REPAINTFN MAPW-SCROLLFN MAPW-BUTTONFN MAPW-RESHAPEFN  
MAPW-ICONCREATE)  
;; Drawing of lat/long. marks, the map legend, etc.  
(FNS MAPW-DRAWLEGEND MAP-DRAWTICKS MAP-DRAWTICKS-LEFT MAP-DRAWTICKS-RIGHT MAP-DRAWTICKS-TOP  
MAP-DRAWTICKS-BOTTOM MAPW-PRINT-COORD)  
;; Coordinate-display subwindow support  
;; Generic COordinate-window functions:  
(FNS COORDW-CREATE COORDW-UPDATE COORDW-REPAINTFN)  
;; Latitude/longitude window  
(FNS COORDW-LAT-CREATE COORDW-LAT-UPDATE COORDW-LAT-REPAINTFN)  
;; Bit-offset window for mapmaking.  
(FNS COORDW-BIT-CREATE COORDW-BIT-UPDATE COORDW-BIT-REPAINTFN)  
;; Functions called to ADD and DELETE items from the map  
(FNS MAPW-ADD-OBJECT MAPW-DELETE-OBJECT)  
(FNS MAPW-MAKE-LEFTMENU MAPW-MAKE-MIDDLEMENU MAPW-MENU-WHENSELECTEDFN)  
(VARS (*MAPW-LEFTBUTTON-ITEMS* '(|Lat/Long Window|))  
(*MAPW-MIDDLEBUTTON-ITEMS* '(|Bit-offset Window|))  
(*MAPW-LEFTBUTTON-MENU*)  
(*MAPW-MIDDLEBUTTON-MENU*))  
(P (MAPW-MAKE-LEFTMENU)  
(MAPW-MAKE-MIDDLEMENU)))  
(COMS ;; Map references. Each reference is a map and coordinates within the map (in pixels) of the location.  
;; You can get ranges and bearings between references.  
(RECORDS MAPREF)  
(FNS MAPREF-BEARING MAPREF-RANGE))  
(COMS ;; The window for unplaced assets.  
(FNS UNPLACEDW-CREATE UNPLACEDW-BUTTONFN))  
(COMS ;; Utility functions  
(FNS SECONDS)  
;; HOLDS THE OBJECT BEING MOVED AROUND BY MOUSE ON THE MAP.  
(INITVARS (*MAPW-MOVING-OBJECT* NIL))  
;; A LIST OF ALL THE MAPS KNOWN TO THE SYSTEM:  
(INITVARS *MAPS* NIL))  
(COMS ;; Object support for mappable items.  
(BITMAPS MAPITEM-CURSOR-IMAGE GENERIC-MAP-IMAGE AMPHIB-CURSOR-IMAGE RORO-CURSOR-IMAGE  
ELCAS-CURSOR-IMAGE CRANE-CURSOR-IMAGE)  
(CLASSES |LotsMappableItem|)  
(METHODS |LotsMappableItem.BuildMarker| |LotsMappableItem.Display|  
|LotsMappableItem.DisplayUnplaced| |LotsMappableItem.HotX| |LotsMappableItem.HotY|  
|LotsMappableItem.ImageH| |LotsMappableItem.ImageW| |LotsMappableItem.SetLocation|  
|LotsMappableItem.UnDisplay| |LotsMappableItem.UnDisplayUnplaced|)))
```

(DECLARE\ : EVAL@COMPILE

(DATATYPE MAPMARK (PIXLAT PIXLONG MARKIMAGE MARKSAVE LAT LONG MARKREGION HOTSPOTX HOTSPOTY OBJECT))

(/DECLAREDATATYPE 'MAPMARK ' (POINTER POINTER POINTER POINTER POINTER POINTER POINTER POINTER POINTER POINTER)
;; ---field descriptor list elided by lister---
'20)

(DEFINEQ

(MAPMARK-REMOVE

(LAMBDA (WINDOW MARK DX DY MAPXOFFSET MAPYOFFSET) ; Edited 7-Jun-93 01:16 by sybalsky:mv:envos
(LET ((X (|fetch| (MAPMARK PIXLONG) |of| MARK))
(Y (|fetch| (MAPMARK PIXLAT) |of| MARK)))
(MAPMARK-UNPLACE WINDOW MARK MAPXOFFSET MAPYOFFSET)
(MAPMARK-PLACE WINDOW MARK (+ X DX)
(+ Y DY)
MAPXOFFSET MAPYOFFSET))))

(MAPMARK-PLACE

(LAMBDA (WINDOW MARK NEWX NEWY MAPXOFFSET MAPYOFFSET) ; Edited 10-Jun-93 14:14 by bane
;; Move MARK's notion of where it is to NEWX,NEWY, and display it at that place, offset by the two MAP offsets (to allow for scrolling, etc.)
(LET ((REG (|fetch| (MAPMARK MARKREGION) |of| MARK))
(|replace| (MAPMARK PIXLAT) |of| MARK |with| (+ NEWY MAPYOFFSET))
(|replace| (MAPMARK PIXLONG) |of| MARK |with| (+ NEWX MAPXOFFSET))
(SETQ LEFT (|replace| (REGION LEFT) |of| REG |with| (- NEWX (|fetch| (MAPMARK HOTSPOTX) |of| MARK))))
(SETQ BOTTOM (|replace| (REGION BOTTOM) |of| REG |with| (- NEWY (|fetch| (MAPMARK HOTSPOTY) |of| MARK))))
_!
(|fetch| (MAPMARK OBJECT) |of| MARK)
(CL:IF (MAPW-P WINDOW)
' |Display|
' |DisplayUnplaced|)
WINDOW NEWX NEWY)
(* BITBLT WINDOW LEFT BOTTOM
(|fetch| (MAPMARK MARKSAVE) |of| MARK) 0 0 NIL NIL
(QUOTE INPUT) (QUOTE REPLACE))
(* BITBLT (|fetch| (MAPMARK MARKIMAGE) |of| MARK) 0 0
WINDOW LEFT BOTTOM NIL NIL
(QUOTE INPUT) (QUOTE PAINT))
)))

(MAPMARK-UNPLACE

(LAMBDA (WINDOW MARK NEWX NEWY MAPXOFFSET MAPYOFFSET) ; Edited 10-Jun-93 14:14 by bane
;; UNdisplay MARK off of WINDOW, leaving behind the saved image.
(LET* ((REG (|fetch| (MAPMARK MARKREGION) |of| MARK))
(X (|fetch| (REGION LEFT) |of| REG))
(Y (|fetch| (REGION BOTTOM) |of| REG)))
_!
(|fetch| (MAPMARK OBJECT) |of| MARK)
(CL:IF (MAPW-P WINDOW)
' |UnDisplay|
' |UnDisplayUnplaced|)
WINDOW
(+ X (|fetch| (MAPMARK HOTSPOTX) |of| MARK))
(+ Y (|fetch| (MAPMARK HOTSPOTY) |of| MARK)))
(* BITBLT (|fetch| (MAPMARK MARKSAVE) |of| MARK) 0 0
WINDOW X Y NIL NIL (QUOTE INPUT)
(QUOTE REPLACE))
)))

(MAKE-MAPMARK

(LAMBDA (OBJECT) ; Edited 10-Jun-93 19:53 by bane
(LET* ((WIDTH (_ OBJECT |ImageW|))
(HEIGHT (_ OBJECT |ImageH|))
(HOTX (_ OBJECT |HotX|))
(HOTY (_ OBJECT |HotY|))
(REGION (LIST (IMINUS HOTX)
(IMINUS HOTY)
WIDTH HEIGHT)))
(|create| MAPMARK
PIXLAT _ 0
PIXLONG _ 0
HOTSPOTX _ HOTX
HOTSPOTY _ HOTY
MARKREGION _ REGION
MARKSAVE _ (_@
OBJECT : |map-save| (BITMAPCREATE WIDTH HEIGHT))
OBJECT _ OBJECT))))

(MAPW-DISPLAY-MARK

; Edited 10-Jun-93 16:23 by bane

```
(LAMBDA (WINDOW MARK)
  (LET ((REG (|fetch| (MAPMARK MARKREGION) |of| MARK))
        (MAPX (WINDOWPROP WINDOW 'MAPX))
        (MAPY (WINDOWPROP WINDOW 'MAPY))
        (CLP (DSPCLIPPINGREGION (WINDOWPROP WINDOW 'MAPCLIP)
                                WINDOW)))
    (_!
     (|fetch| (MAPMARK OBJECT) |of| MARK)
     ' |Draw| WINDOW (+ (|fetch| (MAPMARK HOTSPOTX) |of| MARK)
                       (|fetch| (REGION LEFT) |of| REG))
     (+ (|fetch| (MAPMARK HOTSPOTY) |of| MARK)
        (|fetch| (REGION BOTTOM) |of| REG)))

    (DSPCLIPPINGREGION CLP WINDOW))))
```

```
(* BITBLT (|fetch| (MAPMARK MARKIMAGE) |of| MARK) 0 0
WINDOW (|fetch| (REGION LEFT) |of| REG)
(|fetch| (REGION BOTTOM) |of| REG) NIL NIL
(QUOTE INPUT) (QUOTE PAINT))
```

(DEFINEQ

(MAPMARKS-UPDATEY

; Edited 4-Jun-93 19:04 by sybalsky:mv:envos

```
(LAMBDA (MARKS DY)
  (|for| MARK |in| MARKS |do| (|add| (|fetch| (REGION BOTTOM) |of| (|fetch| (MAPMARK MARKREGION) |of| MARK))
                                DY))))
```

(MAPMARKS-UPDATEX

```
(LAMBDA (MARKS DX)
  (|for| MARK |in| MARKS |do| (|add| (|fetch| (REGION LEFT) |of| (|fetch| (MAPMARK MARKREGION) |of| MARK))
                                DX))))
```

;;; This file implements map windows for LOTS.

;; The map/map window itself

(DECLARE\ : EVAL@COMPILE

```
(DATATYPE MAP (MAPNAME MAPSERIES MAPSCALE LATITUDE LONGITUDE IMAGE PIXPERSECLAT PIXPERSECLONG PIXPERYARD MAGDEC
               TRUEDEC OTHERMAPS LATORG LONGORG)
MAGDEC _ 0 TRUEDEC _ 0 LATORG _ 0 LONGORG _ 0)
```

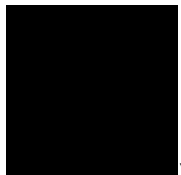
```
(/DECLAREDATATYPE 'MAP '(POINTER POINTER POINTER POINTER POINTER POINTER POINTER POINTER POINTER POINTER POINTER
                           POINTER POINTER POINTER))
```

```
;; ---field descriptor list elided by lister---
' 28)
```

(RPAQQ **MAPW-ICON-IMAGE**



(RPAQQ **MAPW-ICON-MASK**



(DECLARE\ : EVAL@COMPILE

(RPAQQ **MAP-SIDE-BEARING** 50)

(RPAQQ **MAP-BOTTOM-BEARING** 60)

(RPAQQ **MAP-TOP-BEARING** 30)

(RPAQQ **MAP-2SIDE-BEARING** 100)

(RPAQQ **MAP-2BOTTOM-BEARING** 90)

```
(CONSTANTS (MAP-SIDE-BEARING 50)
            (MAP-BOTTOM-BEARING 60)
            (MAP-TOP-BEARING 30)
            (MAP-2SIDE-BEARING 100)
            (MAP-2BOTTOM-BEARING 90))
```

)

(DEFINEQ

(MAP-CREATE

(LAMBDA (NAME SERIES SCALE LAT LONG IMAGE PIX/LAT PIX/LONG PIX/YARD MAGDEC TRUEDEC OTHERMAPS) ; Edited 9-Jun-93 15:32 by bane

:: Create a MAP from its constituent parts.

(|create| MAP
MAPNAME _ NAME
MAPSERIES _ SERIES
MAPSCALE _ SCALE
LATITUDE _ LAT
LONGITUDE _ LONG
IMAGE _ IMAGE
PIXPERSECLAT _ PIX/LAT
PIXPERSECLONG _ PIX/LONG
PIXPERYARD _ PIX/YARD
MAGDEC _ MAGDEC
TRUEDEC _ TRUEDEC
OTHERMAPS _ OTHERMAPS))

)

:: Creation and basic window operations

(DEFINEQ

(MAPW-CREATE

(LAMBDA (REGION MAP SCENARIO) ; Edited 10-Jun-93 23:48 by bane

:: Create a map window in REGION. The window will display the map MAP, and any mappable objects from LOTS scenario SCENARIO.

(LET ((WINDOW (CREATEW (AND REGION (|create| REGION |using| REGION BOTTOM _ (+ 60 (|fetch| (REGION BOTTOM) |of| REGION))
HEIGHT _ (- (|fetch| (REGION HEIGHT) |of| REGION) 60)))
(|fetch| (MAP MAPNAME) |of| MAP)))
REG MAPCLIP UNPLACED)

:: Start out with the lower-left corner of the map showing in the window.

(WINDOWPROP WINDOW 'MAPX 0)
(WINDOWPROP WINDOW 'MAPY 0)
(WINDOWPROP WINDOW 'MAP MAP)

:: Connect the scenario, so the map can find it, if need be.

(WINDOWPROP WINDOW 'MAPSCENARIO SCENARIO)

:: Set up MAPCLIP, the clipping region for the actual map display within the window.

(SETQ REG (COPY (DSPCLIPPINGREGION NIL WINDOW)))
(|add| (|fetch| (REGION LEFT) |of| REG)
MAP-SIDE-BEARING)
(|add| (|fetch| (REGION BOTTOM) |of| REG)
MAP-BOTTOM-BEARING)
(|add| (|fetch| (REGION WIDTH) |of| REG)
(IMINUS MAP-2SIDE-BEARING))
(|add| (|fetch| (REGION HEIGHT) |of| REG)
(IMINUS MAP-2BOTTOM-BEARING))
(WINDOWPROP WINDOW 'MAPCLIP REG)
(SETQ MAPCLIP REG)

:: Set up the window support functions for a Map window.

(WINDOWPROP WINDOW 'SCROLLFN (FUNCTION MAPW-SCROLLFN))
(WINDOWPROP WINDOW 'REPAINTFN (FUNCTION MAPW-REPAINTFN))
(WINDOWPROP WINDOW 'BUTTONEVENTFN (FUNCTION MAPW-BUTTONFN))
(WINDOWPROP WINDOW 'RESHAPEFN (FUNCTION MAPW-RESHAPEFN))
(WINDOWPROP WINDOW 'ICONFN (FUNCTION MAPW-ICONCREATE))
(REDISPLAYW WINDOW)
(DSOPERATION 'PAINT WINDOW)

:: Set up the window for unplaced assets

(SETQ REG (WINDOWPROP WINDOW 'REGION))
(ATTACHWINDOW (SETQ UNPLACED (UNPLACEDW-CREATE (LIST (|fetch| (REGION LEFT) |of| REG)
(- (|fetch| (REGION BOTTOM) |of| REG) 60)
(|fetch| (REGION WIDTH) |of| REG) 60)))
WINDOW
'BOTTOM
'JUSTIFY)
(WINDOWPROP WINDOW 'MAPUNPLACED UNPLACED)
(WINDOWPROP WINDOW 'EXTENT (CREATEREGION 0 0 (FIXR (TIMES (|fetch| (REGION WIDTH) |of| REG)
(FQUOTIENT (BITMAPWIDTH (|fetch| (MAP IMAGE) |of| MAP))
(|fetch| (REGION WIDTH) |of| MAPCLIP))))
(FIXR (TIMES (|fetch| (REGION HEIGHT) |of| REG)
(FQUOTIENT (BITMAPHEIGHT (|fetch| (MAP IMAGE) |of| MAP))

(|fetch| (REGION HEIGHT) |of| MAPCLIP))))))

:: Set us up a prompt window attached to this window.

(GETPROMPTWINDOW WINDOW 1)
WINDOW))

(MAPW-P

(LAMBDA (WINDOW
(WINDOWPROP WINDOW 'MAP)))

(MAP-EQUAL

(LAMBDA (MAP1 MAP2)

; Edited 23-Jun-93 20:04 by sybalsky:mv:envos

:: Equality predicate for two maps. Returns NIL unless they represent the same region, with the same name, etc.

(AND (STRING-EQUAL (|fetch| (MAP MAPNAME) |of| MAP1)
(|fetch| (MAP MAPNAME) |of| MAP2))
(STRING-EQUAL (|fetch| (MAP MAPSERIES) |of| MAP1)
(|fetch| (MAP MAPSERIES) |of| MAP2))
(= (|fetch| (MAP MAPSCALE) |of| MAP1)
(|fetch| (MAP MAPSCALE) |of| MAP2))
(= (|fetch| (MAP LATITUDE) |of| MAP1)
(|fetch| (MAP LATITUDE) |of| MAP2))
(= (|fetch| (MAP LONGITUDE) |of| MAP1)
(|fetch| (MAP LONGITUDE) |of| MAP2))
(= (|fetch| (MAP PIXPERSECLAT) |of| MAP1)
(|fetch| (MAP PIXPERSECLAT) |of| MAP2))
(= (|fetch| (MAP PIXPERSECLONG) |of| MAP1)
(|fetch| (MAP PIXPERSECLONG) |of| MAP2))
(= (|fetch| (MAP PIXPERYARD) |of| MAP1)
(|fetch| (MAP PIXPERYARD) |of| MAP2))))))

(MAPW-REPAINTFN

(LAMBDA (WINDOW REGION)

; Edited 10-Jun-93 23:44 by bane

(LET ((L (|fetch| (REGION LEFT) |of| REGION))
(B (|fetch| (REGION BOTTOM) |of| REGION))
(W (|fetch| (REGION WIDTH) |of| REGION))
(H (|fetch| (REGION HEIGHT) |of| REGION))
(MAP (WINDOWPROP WINDOW 'MAP))
(MAPX (WINDOWPROP WINDOW 'MAPX))
(MAPY (WINDOWPROP WINDOW 'MAPY))
(MAPCLIP (WINDOWPROP WINDOW 'MAPCLIP))
(MAPMARKS (WINDOWPROP WINDOW 'MAPMARKS))
IMAGE-L IMAGE-B IMAGE-W IMAGE-H SCALE SEC/TICK TICKS/PRINT)

:: Compute tick frequency, in (A) seconds per tick, and (B) ticks per printing of lat/long markings

(SETQ SCALE (|fetch| (MAP MAPSCALE) |of| MAP))
(COND
((<= 18000 SCALE 30000)
(SETQ SEC/TICK 30)
(SETQ TICKS/PRINT 5))
((<= 30001 SCALE 50000)

:: SCALE 80000 NAUTICAL CHARTS & DOUBLE SIZE VERSIONS big tick every 5 min.

(SETQ SEC/TICK 30)
(SETQ TICKS/PRINT 2))
(T (SETQ SEC/TICK 5)
(SETQ TICKS/PRINT 2)))
(BITBLT (|fetch| (MAP IMAGE) |of| MAP)
MAPX MAPY WINDOW MAP-SIDE-BEARING MAP-BOTTOM-BEARING 10000 10000 'INPUT 'REPLACE NIL
(INTERSECTREGIONS REGION (WINDOWPROP WINDOW 'MAPCLIP))
MAPCLIP)

(CL:WHEN (REGIONSINTERSECTP REGION (LIST 0 0 MAP-SIDE-BEARING 10000))
(MAP-DRAWTICKS-LEFT WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT))
(CL:WHEN (REGIONSINTERSECTP REGION (LIST 0 0 10000 MAP-BOTTOM-BEARING))
(MAP-DRAWTICKS-BOTTOM WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT)
(MAPW-DRAWLEGEND WINDOW MAP))
(CL:WHEN (REGIONSINTERSECTP REGION (LIST (|fetch| (REGION RIGHT) |of| MAPCLIP)
0 MAP-SIDE-BEARING 10000))
(MAP-DRAWTICKS-RIGHT WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT))
(CL:WHEN (REGIONSINTERSECTP REGION (LIST 0 (|fetch| (REGION TOP) |of| MAPCLIP)
10000 MAP-BOTTOM-BEARING))
(MAP-DRAWTICKS-TOP WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT))
(|for| MARK |in| MAPMARKS |when| (REGIONSINTERSECTP MAPCLIP (|fetch| (MAPMARK MARKREGION) |of| MARK))
|do| (MAPW-DISPLAY-MARK WINDOW MARK))))))

(MAPW-SCROLLFN

(LAMBDA (WINDOW DX DY CONTINUOUSFLG)

; Edited 10-Jun-93 23:39 by bane

:: First, do X scrolling

(LET ((OLDMAPX (WINDOWPROP WINDOW 'MAPX))
(OLDMAPY (WINDOWPROP WINDOW 'MAPY))
(MAP (WINDOWPROP WINDOW 'MAP))
(MAPCLIP (WINDOWPROP WINDOW 'MAPCLIP))

```

(MAPMARKS (WINDOWPROP WINDOW 'MAPMARKS))
MAPX MAPY)
(COND
  ((FIXP DX)
   ;; Scroll a fixed amount
   (SETQ MAPX (IPLUS OLDMAPX (IMINUS DX)))
   (SETQ MAPX (IMAX 0 (IMIN MAPX (- (BITMAPWIDTH (|fetch| (MAP IMAGE) |of| MAP))
                                     (|fetch| (REGION WIDTH) |of| MAPCLIP)))))
   (CL:WHEN (NOT (IEQP OLDMAPX MAPX))
    (WINDOWPROP WINDOW 'MAPX MAPX)
    (MAPMARKS-UPDATEX MAPMARKS (- OLDMAPX MAPX))
    (MAPW-REPAINTFN WINDOW ` (,MAP-SIDE-BEARING 0 , (SUB1 (|fetch| (REGION WIDTH) |of| MAPCLIP))
                            1000))))
  ((FLOATP DX)
   ;; Thumb-scrolling in X
   (SETQ MAPX (FIXR (FTIMES DX (BITMAPWIDTH (|fetch| (MAP IMAGE) |of| MAP)))))
   (SETQ MAPX (IMAX 0 (IMIN MAPX (- (BITMAPWIDTH (|fetch| (MAP IMAGE) |of| MAP))
                                     (|fetch| (REGION WIDTH) |of| MAPCLIP)))))
   (CL:WHEN (NOT (IEQP OLDMAPX MAPX))
    (WINDOWPROP WINDOW 'MAPX MAPX)
    (MAPMARKS-UPDATEX MAPMARKS (- OLDMAPX MAPX))
    (MAPW-REPAINTFN WINDOW ` (,MAP-SIDE-BEARING 0 , (SUB1 (|fetch| (REGION WIDTH) |of| MAPCLIP))
                            1000))))
  ;; Now, do Y scrolling
  (COND
   ((AND (FIXP DY)
          (NOT (ZEROP DY)))
    ;; Scroll a fixed amount
    (SETQ MAPY (IPLUS OLDMAPY (IMINUS DY)))
    (SETQ MAPY (IMAX 0 (IMIN MAPY (- (BITMAPHEIGHT (|fetch| (MAP IMAGE) |of| MAP))
                                      (|fetch| (REGION HEIGHT) |of| MAPCLIP)))))
    (CL:WHEN (NOT (IEQP OLDMAPY MAPY))
     (MAPMARKS-UPDATEY MAPMARKS (- OLDMAPY MAPY))
     (WINDOWPROP WINDOW 'MAPY MAPY)
     (MAPW-REPAINTFN WINDOW `(0 ,MAP-BOTTOM-BEARING 1000 ,(|fetch| (REGION HEIGHT) |of| MAPCLIP))))
    ((FLOATP DY)
     ;; Thumb-scrolling in Y
     (SETQ MAPY (FIXR (FTIMES (FDIFFERENCE 1.0 DY)
                              (BITMAPHEIGHT (|fetch| (MAP IMAGE) |of| MAP)))))
     (SETQ MAPY (IMAX 0 (IMIN MAPY (- (BITMAPHEIGHT (|fetch| (MAP IMAGE) |of| MAP))
                                       (|fetch| (REGION HEIGHT) |of| MAPCLIP)))))
     (CL:WHEN (NOT (IEQP OLDMAPY MAPY))
      (WINDOWPROP WINDOW 'MAPY MAPY)
      (MAPMARKS-UPDATEY MAPMARKS (- OLDMAPY MAPY))
      (MAPW-REPAINTFN WINDOW `(0 ,MAP-BOTTOM-BEARING 1000 ,(|fetch| (REGION HEIGHT) |of| MAPCLIP))))
     (LET ((WID (|fetch| (REGION WIDTH) |of| (WINDOWPROP WINDOW 'REGION)))
           (HGT (|fetch| (REGION HEIGHT) |of| (WINDOWPROP WINDOW 'REGION)))
           (MAPX (WINDOWPROP WINDOW 'MAPX))
           (MAPY (WINDOWPROP WINDOW 'MAPY)))
      (WINDOWPROP WINDOW 'EXTENT (CREATEREGION (FIXR (TIMES WID (FQUOTIENT (BITMAPWIDTH
                                                                           (|fetch| (MAP IMAGE)
                                                                           |of| MAP))
                                                                           (|fetch| (REGION WIDTH)
                                                                           |of| MAPCLIP))
                                                  (- 0 (FQUOTIENT MAPX
                                                         (BITMAPWIDTH (|fetch| (MAP IMAGE)
                                                         |of| MAP)))))
          (FIXR (TIMES HGT (FQUOTIENT (BITMAPHEIGHT (|fetch| (MAP IMAGE)
                                                         |of| MAP))
                                     (|fetch| (REGION HEIGHT) |of| MAPCLIP))
              (- 0 (FQUOTIENT MAPY (BITMAPHEIGHT
                                     (|fetch| (MAP IMAGE)
                                     |of| MAP)))))
          (FIXR (TIMES WID (FQUOTIENT (BITMAPWIDTH (|fetch| (MAP IMAGE)
                                                         |of| MAP))
                                     (|fetch| (REGION WIDTH) |of| MAPCLIP)))))
          (FIXR (TIMES HGT (FQUOTIENT (BITMAPHEIGHT (|fetch| (MAP IMAGE)
                                                         |of| MAP))
                                     (|fetch| (REGION HEIGHT) |of| MAPCLIP)))))
      ))
    )))

```

(MAPW-BUTTONFN

(LAMBDA (WINDOW)

; Edited 11-Jun-93 00:06 by bane

;; BUTTONEVENTFN for map windows.

```

(LET ((X (LASTMOUSEX WINDOW))
      (Y (LASTMOUSEY WINDOW))
      (MAPX (WINDOWPROP WINDOW 'MAPX))
      (MAPY (WINDOWPROP WINDOW 'MAPY))
      (MAP (WINDOWPROP WINDOW 'MAP))
      (MAPMARKS (WINDOWPROP WINDOW 'MAPMARKS)))

```

```

(MAPCLIP (WINDOWPROP WINDOW 'MAPCLIP))
(COORDW (WINDOWPROP WINDOW 'COORDW))
(COND
  ((MOUSESTATE (NOT (OR LEFT MIDDLE)))) ; No buttons down.
)
((NOT (INSIDE? (DSPCLIPPINGREGION NIL WINDOW)
  X Y))
(COND
  ((MOUSESTATE LEFT)
  (MAPW-MENU-WHENSELECTEDFN WINDOW (MENU (OR *MAPW-LEFTBUTTON-MENU* (MAPW-MAKE-LEFTMENU))))
  )
  ((MOUSESTATE MIDDLE)
  (MAPW-MENU-WHENSELECTEDFN WINDOW (MENU (OR *MAPW-MIDDLEBUTTON-MENU* (MAPW-MAKE-MIDDLEMENU
  ))))))
(MOUSESTATE LEFT) ; Left button went down
(|while| (MOUSESTATE LEFT) |do|)
(SETQ X (LASTMOUSEX WINDOW))
(SETQ Y (LASTMOUSEY WINDOW))
(CL:WHEN (INSIDE? MAPCLIP X Y)
  (AND (WINDOWPROP WINDOW 'COORDW)
  (COORDW-UPDATE (WINDOWPROP WINDOW 'COORDW)
  X Y))
(COND
  (*MAPW-MOVING-OBJECT* ; There's a mark being moved; This mouse click puts it in place.
  (MAPMARK-PLACE WINDOW *MAPW-MOVING-OBJECT* X Y (- MAPX MAP-SIDE-BEARING)
  (- MAPY MAP-BOTTOM-BEARING))
  (WINDOWPROP WINDOW 'MAPMARKS (NCONC1 MAPMARKS *MAPW-MOVING-OBJECT*))
  (|fetch| (MAPMARK OBJECT) |of| *MAPW-MOVING-OBJECT*
  '|SetLocation|
  (|create| MAPREF
  MAP _ (WINDOWPROP WINDOW 'MAP)
  PIXLAT _ (|fetch| (MAPMARK PIXLAT) |of| *MAPW-MOVING-OBJECT*)
  PIXLONG _ (|fetch| (MAPMARK PIXLONG) |of| *MAPW-MOVING-OBJECT*))
  (SETQ *MAPW-MOVING-OBJECT* NIL)
  (CURSOR T))
  (T (SETQ MARK (|for| AMARK |in| MAPMARKS |suchthat| (INSIDE? (|fetch| (MAPMARK MARKREGION)
  |of| AMARK)
  X Y)))
  (CL:WHEN MARK
  (MAPMARK-UNPLACE WINDOW MARK (- MAPX MAP-SIDE-BEARING)
  (- MAPY MAP-BOTTOM-BEARING))
  (SETQ *MAPW-MOVING-OBJECT* MARK)
  (|fetch| (MAPMARK OBJECT) |of| *MAPW-MOVING-OBJECT*
  '|SetLocation| NIL)
  (CURSOR (@ (|fetch| (MAPMARK OBJECT) |of| MARK)
  |::move-cursor|))
  (SETQ MAPMARKS (REMOVE MARK MAPMARKS))
  (WINDOWPROP WINDOW 'MAPMARKS MAPMARKS))))))
(MOUSESTATE MIDDLE) ; Middle button went down
))))

```

(MAPW-RESHAPEFN

```

(LAMBDA (WINDOW) ; Edited 7-Jun-93 13:13 by sybalsky:mv:envos
;; Aftermath of reshaping a map window -- fix the clipping region. ; Edited 7-Jun-93 13:12 by sybalsky:mv:envos
(LET (REG MAPCLIP)
  (SETQ REG (COPY (DSPCLIPPINGREGION NIL WINDOW)))
  (|add| (|fetch| (REGION LEFT) |of| REG)
  MAP-SIDE-BEARING)
  (|add| (|fetch| (REGION BOTTOM) |of| REG)
  MAP-BOTTOM-BEARING)
  (|add| (|fetch| (REGION WIDTH) |of| REG)
  (MINUS MAP-2SIDE-BEARING))
  (|add| (|fetch| (REGION HEIGHT) |of| REG)
  (MINUS MAP-2BOTTOM-BEARING))
  (WINDOWPROP WINDOW 'MAPCLIP REG)
  (REDISPLAYW WINDOW)
  WINDOW))

```

(MAPW-ICONCREATE

```

(LAMBDA (W ICON ICON-POSITION) ; Edited 7-Jun-93 13:37 by sybalsky:mv:envos
;; Create the icon that represents this window.
(PROG ((ICON (WINDOWPROP W 'ICON)))
  (COND
    (ICON) ; install a new icon
    (T
      (WINDOWPROP W 'ICON (TITLEDICONW (|create| TITLEDICON
      ICON _ MAPW-ICON-IMAGE
      MASK _ MAPW-ICON-MASK
      TITLEREG _ '(3 3 57 33))
      (WINDOWPROP W 'TITLE)

```

```
(FONTCREATE 'MODERN 10)
ICON-POSITION T NIL 'FILE))))
```

```
(WINDOWPROP W 'ICON)))
```

)

:: Drawing of lat/long. marks, the map legend, etc.

(DEFINEQ

(MAPW-DRAWLEGEND

```
(LAMBDA (WINDOW)
  (LET ((MAP (WINDOWPROP WINDOW 'MAP))
        STRING)
    (DSPFONT ' (MODERN 12)
             WINDOW)
    (SETQ STRING (CONCAT "1:" (MKSTRING (|fetch| (MAP MAPSCALE) |of| MAP))))
    (MOVETO (- (/ (|fetch| (REGION WIDTH) |of| (DSPCLIPPINGREGION NIL WINDOW)
                  2)
                 (/ (STRINGWIDTH STRING WINDOW)
                    2))
            10 WINDOW)
    (PRIN1 STRING WINDOW))))
```

(MAP-DRAWTICKS

```
(LAMBDA (WINDOW MAP MAPX MAPY L B W H)
```

; Edited 4-Jun-93 14:13 by sybalsky:mv:envos

:: Draw the latitude/longitude indicia in a map window

```
(LET ((R (IPLUS L W -1))
      (TOP (IPLUS B H -1))
      (PIXLAT (|fetch| (MAP PIXPERSECLAT) |of| MAP))
      (PIXLONG (|fetch| (MAP PIXPERSECLONG) |of| MAP))
      (LATBOT (|fetch| (MAP LATITUDE) |of| MAP))
      (LONGBOT (|fetch| (MAP LONGITUDE) |of| MAP))
      (P5LAT (FIXR (FTIMES (|fetch| (MAP PIXPERSECLAT) |of| MAP)
                          5)))
      (P5LONG (FIXR (FTIMES (|fetch| (MAP PIXPERSECLONG) |of| MAP)
                           5)))
      FIRSTTICK LASTTICK)
```

:: Draw ticks at 5" intervals in latitude, labelling every 10"

```
(SETQ FIRSTTICK (CL:CEILING (+ MAPY B
                              P5LAT))
      LASTTICK (CL:FLOOR (+ MAPY TOP
                            P5LAT))
      (BITBLT NIL NIL NIL WINDOW 0 0 MAP-SIDE-BEARING 10000 'TEXTURE 'REPLACE 0)
      (|for| TICK |from| FIRSTTICK |to| LASTTICK |do| (SETQ Y (+ MAP-BOTTOM-BEARING (- (ITIMES P5LAT TICK)
                                                                                       MAPY)))
              (CL:WHEN (<= B Y TOP)
                (DRAWLINE (+ L MAP-SIDE-BEARING -8)
                          Y
                          (+ L MAP-SIDE-BEARING)
                          Y 1 'PAINT WINDOW)
                (DRAWLINE (+ R (IMINUS MAP-SIDE-BEARING)
                              8)
                          Y
                          (- R MAP-SIDE-BEARING)
                          Y 1 'PAINT WINDOW)
                (CL:WHEN (EVENP TICK)
                          (MOVETO 0 Y WINDOW)
                          (MAPW-PRINT-COORD WINDOW (IPLUS LATBOT
                                                           (ITIMES TICK 5)))))))
      )))
```

(MAP-DRAWTICKS-LEFT

```
(LAMBDA (WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT)
```

; Edited 10-Jun-93 22:49 by bane

:: Draw the latitude/longitude indicia in a map window

```
(LET ((R (IPLUS L W -1))
      (TOP (IPLUS B H -1))
      (PIXLAT (|fetch| (MAP PIXPERSECLAT) |of| MAP))
      (PIXLONG (|fetch| (MAP PIXPERSECLONG) |of| MAP))
      (LATBOT (|fetch| (MAP LATITUDE) |of| MAP))
      (LONGBOT (|fetch| (MAP LONGITUDE) |of| MAP))
      (LATORG (|fetch| (MAP LATORG) |of| MAP))
      (P5LAT (FIXR (FTIMES (|fetch| (MAP PIXPERSECLAT) |of| MAP)
                          SEC/TICK)))
      (P5LONG (FIXR (FTIMES (|fetch| (MAP PIXPERSECLONG) |of| MAP)
                           SEC/TICK)))
      FIRSTTICK LASTTICK Y)
```

:: Draw ticks at 15" intervals in latitude, labelling every 2'30"

```
(SETQ FIRSTTICK (CL:CEILING (- (+ MAPY B
                                MAP-BOTTOM-BEARING LATORG)
                              P5LAT))
```



```
(SETQ LASTTICK (CL:FLOOR (- (+ MAPY TOP)
                           MAP-BOTTOM-BEARING LATORG)
                          P5LAT))
(BITBLT NIL NIL NIL WINDOW 0 0 MAP-SIDE-BEARING 10000 'TEXTURE 'REPLACE 0)
(|for| TICK |from| FIRSTTICK |to| LASTTICK |do| (SETQ Y (+ LATORG MAP-BOTTOM-BEARING (- (ITIMES P5LAT TICK)
                                                                                       MAPY)))
          (CL:WHEN (<= B Y TOP)
            (DRAWLINE (+ L MAP-SIDE-BEARING -8)
                      Y
                      (+ L MAP-SIDE-BEARING)
                      Y 1 'PAINT WINDOW)
            (CL:WHEN (EVENP TICK TICKS/PRINT)
              (MOVETO 0 Y WINDOW)
              (MAPW-PRINT-COORD WINDOW (IPLUS LATBOT
                                           (ITIMES TICK
                                           SEC/TICK))))))
))))
```

(MAP-DRAWTICKS-RIGHT

(LAMBDA (WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT) ; Edited 10-Jun-93 23:00 by bane

;; Draw the latitude/longitude indicia in a map window

```
(LET ((R (|fetch| (REGION RIGHT) |of| (DSPCLIPPINGREGION NIL WINDOW)))
      (TOP (IPLUS B H -1))
      (PIXLAT (|fetch| (MAP PIXPERSECLAT) |of| MAP))
      (PIXLONG (|fetch| (MAP PIXPERSECLONG) |of| MAP))
      (LATBOT (|fetch| (MAP LATITUDE) |of| MAP))
      (LONGBOT (|fetch| (MAP LONGITUDE) |of| MAP))
      (LATORG (|fetch| (MAP LATORG) |of| MAP))
      (P5LAT (FIXR (FTIMES (|fetch| (MAP PIXPERSECLAT) |of| MAP)
                         SEC/TICK)))
      (P5LONG (FIXR (FTIMES (|fetch| (MAP PIXPERSECLONG) |of| MAP)
                          SEC/TICK)))
      (FIRSTTICK LASTTICK Y))
```

;; Draw ticks at 5" intervals in latitude, labelling every 10"

```
(SETQ FIRSTTICK (CL:CEILING (- (+ MAPY B)
                              MAP-BOTTOM-BEARING LATORG)
                             P5LAT))
(SETQ LASTTICK (CL:FLOOR (- (+ MAPY TOP)
                            MAP-BOTTOM-BEARING LATORG)
                           P5LAT))
(BITBLT NIL NIL NIL WINDOW (- R MAP-SIDE-BEARING)
         MAP-BOTTOM-BEARING MAP-SIDE-BEARING 10000 'TEXTURE 'REPLACE 0)
(|for| TICK |from| FIRSTTICK |to| LASTTICK |do| (SETQ Y (+ LATORG MAP-BOTTOM-BEARING (- (ITIMES P5LAT TICK)
                                                                                       MAPY)))
          (CL:WHEN (<= B Y TOP)
            (DRAWLINE (+ R (IMINUS MAP-SIDE-BEARING)
                          8)
                      Y
                      (- R MAP-SIDE-BEARING)
                      Y 1 'PAINT WINDOW)
            (CL:WHEN (EVENP TICK TICKS/PRINT)
              (MOVETO (+ R (IMINUS MAP-SIDE-BEARING)
                          8)
                      Y WINDOW)
              (MAPW-PRINT-COORD WINDOW (IPLUS LATBOT
                                           (ITIMES TICK
                                           SEC/TICK))))))
))))
```

(MAP-DRAWTICKS-TOP

(LAMBDA (WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT) ; Edited 6-Jun-93 11:14 by sybalsky:mv:envos

;; Draw the latitude/longitude indicia in a map window

```
(AND NIL (LET ((R (IPLUS L W -1))
              (TOP (IPLUS B H -1))
              (PIXLAT (|fetch| (MAP PIXPERSECLAT) |of| MAP))
              (PIXLONG (|fetch| (MAP PIXPERSECLONG) |of| MAP))
              (LATBOT (|fetch| (MAP LATITUDE) |of| MAP))
              (LONGBOT (|fetch| (MAP LONGITUDE) |of| MAP))
              (P5LAT (FIXR (FTIMES (|fetch| (MAP PIXPERSECLAT) |of| MAP)
                               SEC/TICK)))
              (P5LONG (FIXR (FTIMES (|fetch| (MAP PIXPERSECLONG) |of| MAP)
                               SEC/TICK)))
              (FIRSTTICK LASTTICK))
```

;; Draw ticks at 5" intervals in latitude, labelling every 10"

```
(SETQ FIRSTTICK (CL:CEILING (+ MAPY B)
                             P5LAT))
(SETQ LASTTICK (CL:FLOOR (+ MAPY TOP)
                          P5LAT))
(BITBLT NIL NIL NIL WINDOW 0 0 MAP-SIDE-BEARING 10000 'TEXTURE 'REPLACE 0)
(|for| TICK |from| FIRSTTICK |to| LASTTICK |do| (SETQ Y (+ MAP-BOTTOM-BEARING (- (ITIMES P5LAT TICK)
```

```

MAPY)))
(CL:WHEN (<= B Y TOP)
  (DRAWLINE (+ L MAP-SIDE-BEARING -8)
    Y
    (+ L MAP-SIDE-BEARING)
    Y 1 'PAINT WINDOW)
  (DRAWLINE (+ R (IMINUS MAP-SIDE-BEARING)
    8)
    Y
    (- R MAP-SIDE-BEARING)
    Y 1 'PAINT WINDOW)
  (CL:WHEN (EVENP TICK TICKS/PRINT)
    (MOVETO 0 Y WINDOW)
    (MAPW-PRINT-COORD WINDOW (IPLUS LATBOT (ITIMES TICK SEC/TICK))))))

```

(MAP-DRAWTICKS-BOTTOM

(LAMBDA (WINDOW MAP MAPX MAPY L B W H SEC/TICK TICKS/PRINT) ; Edited 8-Jun-93 10:57 by sybalsky:mv:envos

;; Draw the latitude/longitude indicia across the bottom of a map window

```

(LET ((R (IPLUS L W -1))
      (TOP (IPLUS B H -1))
      (PIXLONG (|fetch| (MAP PIXPERSECLONG) |of| MAP))
      (LONGBOT (|fetch| (MAP LONGITUDE) |of| MAP))
      (LONGORG (FETCH (MAP LONGORG) OF MAP))
      (P5LONG (FIXR (FTIMES (|fetch| (MAP PIXPERSECLONG) |of| MAP)
        SEC/TICK)))
      (FIRSTTICK LASTTICK X)

```

;; Draw ticks at 5" intervals in latitude, labelling every 10"

```

(SETQ FIRSTTICK (CL:CEILING (- (+ MAPX L)
  MAP-SIDE-BEARING LONGORG)
  P5LONG))
(SETQ LASTTICK (CL:FLOOR (- (+ MAPX R)
  MAP-SIDE-BEARING LONGORG)
  P5LONG))
(BITBLT NIL NIL NIL WINDOW 0 0 10000 MAP-BOTTOM-BEARING 'TEXTURE 'REPLACE 0)
(|for| TICK |from| FIRSTTICK |to| LASTTICK |do| (SETQ X (+ LONGORG MAP-SIDE-BEARING (- (ITIMES P5LONG TICK)
  MAPX)))
  (CL:WHEN (<= L X R)
    (DRAWLINE X (- MAP-BOTTOM-BEARING 8)
      X MAP-BOTTOM-BEARING 1 'PAINT WINDOW)
    (CL:WHEN (EVENP TICK TICKS/PRINT)
      (MOVETO X (- MAP-BOTTOM-BEARING 8)
        WINDOW)
      (MAPW-PRINT-COORD WINDOW (IPLUS LONGBOT
        (ITIMES TICK
        SEC/TICK))
        NIL T))))))

```

(MAPW-PRINT-COORD

(LAMBDA (STR SEC SHOWS CENTER? FONT) ; Edited 9-Jun-93 16:02 by bane

```

(DSPFONT (OR FONT ' (MODERN 8))
  STR)
(LET ((ORIGSEC SEC)
      (SETQ SEC (IABS SEC))
      (COND
        (CENTER?

```

;; Center it UNDER the current point.

```

(LET ((STRING (CL:FORMAT NIL "~D°~D'~d\" (IQUOTIENT SEC 3600)
  (IQUOTIENT (IREMAINDER SEC 3600)
  60)
  (IREMAINDER SEC 60))))
  (SELECTQ SHOWS
    (NS (SETQ STRING (CONCAT STRING (CL:IF (IGREATERP SEC 0)
      (PRIN1 "N" STR)
      (PRIN1 "S" STR))))
      (EW (SETQ STRING (CONCAT STRING (CL:IF (IGREATERP SEC 0)
      (PRIN1 "E" STR)
      (PRIN1 "W" STR))))
      NIL)
    (SETQ WIDTH (STRINGWIDTH STRING STR))
    (MOVETO (- (DSPXPOSITION NIL STR)
      (LRSH WIDTH 1))
      (- (DSPYPOSITION NIL STR)
      (FONTPROP (DSPFONT NIL STR)
      'ASCENT))
      STR)
    (PRIN1 STRING STR)))

```

(T ;; Print at the current point.

```

(CL:FORMAT STR "~D°~D'~d\" (IQUOTIENT SEC 3600)
  (IQUOTIENT (IREMAINDER SEC 3600)
  60)
  (IREMAINDER SEC 60))

```

```
(SELECTQ SHOWNS
  (NS (CL:IF (IGREATERP ORIGSEC 0)
    (PRIN1 "N" STR)
    (PRIN1 "S" STR)))
  (EW (CL:IF (IGREATERP ORIGSEC 0)
    (PRIN1 "E" STR)
    (PRIN1 "W" STR)))
  NIL)))
```

)

:: Coordinate-display subwindow support

:: Generic COordinate-window functions:

(DEFINEQ

(COORDW-CREATE

(LAMBDA (MAINWINDOW TYPE)

; Edited 10-Jun-93 22:13 by bane

:: Create the coordinate-display window that goes with a map window.

```
(SELECTQ TYPE
  (LATLONG (COORDW-LAT-CREATE MAINWINDOW))
  (BITS (COORDW-BIT-CREATE MAINWINDOW))
  NIL))
```

(COORDW-UPDATE

(LAMBDA (MAINWINDOW X Y)

; Edited 10-Jun-93 22:17 by bane

```
(SELECTQ (WINDOWPROP MAINWINDOW 'COORDWTYPE)
  (LATLONG (COORDW-LAT-UPDATE MAINWINDOW X Y))
  (BITS (COORDW-BIT-UPDATE MAINWINDOW X Y))
  NIL))
```

(COORDW-REPAINTFN

(LAMBDA (WINDOW)
 NIL)

; Edited 10-Jun-93 22:04 by bane

)

:: Latitude/longitude window

(DEFINEQ

(COORDW-LAT-CREATE

(LAMBDA (MAINWINDOW)

; Edited 10-Jun-93 22:01 by bane

:: Create the coordinate-display window that goes with a map window.

```
(LET* ((FONT (FONTCREATE 'MODERN 10))
  (BOLD (FONTCREATE 'MODERN 10 'BOLD))
  (WIDTH (+ (STRINGWIDTH "Lat " BOLD)
    (STRINGWIDTH "180o99'99\" " FONT)
    (STRINGWIDTH "Long: " BOLD)
    (STRINGWIDTH "180o99'99\" " FONT)))
  (HEIGHT (FONTPROP BOLD 'HEIGHT))
  WINDOW BOT)
  (SETQ WINDOW (CREATEW (LIST 0 0 (WIDTHIFWINDOW WIDTH)
    (HEIGHTIFWINDOW HEIGHT))
    NIL NIL T))
  (WINDOWPROP WINDOW 'COORDWTYPE 'LATLONG)
  (ATTACHWINDOW WINDOW MAINWINDOW 'TOP 'LEFT)
  (WINDOWPROP WINDOW 'LATBOT (SETQ BOT (FONTPROP BOLD 'DESCENT)))
  (WINDOWPROP WINDOW 'LATLEFT (STRINGWIDTH "Lat " BOLD))
  (WINDOWPROP WINDOW 'LONGLLEFT (+ (STRINGWIDTH "Lat " BOLD)
    (STRINGWIDTH "180o99'99\" " FONT)
    (STRINGWIDTH "Long: " BOLD)))
  (DSPFONT BOLD WINDOW)
  (MOVETO 0 BOT WINDOW)
  (PRIN1 "Lat: " WINDOW)
  (MOVETO (+ (STRINGWIDTH "Lat " BOLD)
    (STRINGWIDTH "180o99'99\" " FONT))
    BOT WINDOW)
  (PRIN1 "Long: " WINDOW)
  (DSPFONT FONT WINDOW)
  WINDOW))
```

(COORDW-LAT-UPDATE

(LAMBDA (WINDOW X Y)

; Edited 10-Jun-93 22:22 by bane

```
(LET* ((LATBOT (WINDOWPROP WINDOW 'LATBOT))
  (LATLEFT (WINDOWPROP WINDOW 'LATLEFT))
  (LONGLLEFT (WINDOWPROP WINDOW 'LONGLLEFT))
  MAINWINDOW (WINDOWPROP WINDOW 'MAINWINDOW))
  (MAP (WINDOWPROP MAINWINDOW 'MAP))
  (MAPX (WINDOWPROP MAINWINDOW 'MAPX))
  (MAPY (WINDOWPROP MAINWINDOW 'MAPY))
```

```

(LAT (+ (|fetch| (MAP LATITUDE) |of| MAP)
  (/ (- (+ MAPY Y)
    MAP-BOTTOM-BEARING
    (|fetch| (MAP LATORG) |of| MAP))
    (|fetch| (MAP PIXPERSECLAT) |of| MAP))))
(LONG (+ (|fetch| (MAP LONGITUDE) |of| MAP)
  (/ (- (+ MAPX X)
    MAP-SIDE-BEARING
    (|fetch| (MAP LONGORG) |of| MAP))
    (|fetch| (MAP PIXPERSECLONG) |of| MAP))))
(BITBLT NIL NIL NIL WINDOW LATLEFT LATBOT (LOADTIMECONSTANT (STRINGWIDTH "180o99'99\" "
  (FONTCREATE 'MODERN 10)))
  100
  'TEXTURE
  'REPLACE WHITESHADE)
(BITBLT NIL NIL NIL WINDOW LONGLEFT LATBOT (LOADTIMECONSTANT (STRINGWIDTH "180o99'99\" "
  (FONTCREATE 'MODERN 10)))
  100
  'TEXTURE
  'REPLACE WHITESHADE)
(MOVETO LATLEFT LATBOT WINDOW)
(MAPW-PRINT-COORD WINDOW LAT NIL NIL ' (MODERN 10))
(MOVETO LONGLEFT LATBOT WINDOW)
(MAPW-PRINT-COORD WINDOW LONG NIL NIL ' (MODERN 10))))

```

(COORDW-LAT-REPAINTFN

```

(LAMBDA (WINDOW)
  ASDF)

```

)

:: Bit-offset window for mapmaking.

(DEFINEQ

(COORDW-BIT-CREATE

```

(LAMBDA (MAINWINDOW)

```

; Edited 10-Jun-93 22:18 by bane

:: Create the coordinate-display window that goes with a map window.

```

(LET* ((FONT (FONTCREATE 'MODERN 10))
  (BOLD (FONTCREATE 'MODERN 10 'BOLD))
  (WIDTH (+ (STRINGWIDTH "X: " BOLD)
    (STRINGWIDTH "00000 " FONT)
    (STRINGWIDTH "Y: " BOLD)
    (STRINGWIDTH "00000 " FONT)))
  (HEIGHT (FONTPROP BOLD 'HEIGHT))
  WINDOW BOT)
  (SETQ WINDOW (CREATEW (LIST 0 0 (WIDTHIFWINDOW WIDTH)
    (HEIGHTIFWINDOW HEIGHT))
    NIL NIL T))
  (WINDOWPROP WINDOW 'COORDWTYPE 'BITS)
  (ATTACHWINDOW WINDOW MAINWINDOW 'TOP 'LEFT)
  (WINDOWPROP WINDOW 'LATBOT (SETQ BOT (FONTPROP BOLD 'DESCENT)))
  (WINDOWPROP WINDOW 'LONLEFT (STRINGWIDTH "X: " BOLD))
  (WINDOWPROP WINDOW 'LATLEFT (+ (STRINGWIDTH "X: " BOLD)
    (STRINGWIDTH "00000 " FONT)
    (STRINGWIDTH "Y: " BOLD)))
  (DSPFONT BOLD WINDOW)
  (MOVETO 0 BOT WINDOW)
  (PRIN1 "X: " WINDOW)
  (MOVETO (+ (STRINGWIDTH "X: " BOLD)
    (STRINGWIDTH "00000 " FONT))
    BOT WINDOW)
  (PRIN1 "Y: " WINDOW)
  (DSPFONT FONT WINDOW)
  WINDOW))

```

(COORDW-BIT-UPDATE

```

(LAMBDA (WINDOW X Y)

```

; Edited 10-Jun-93 22:22 by bane

```

(LET* ((LATBOT (WINDOWPROP WINDOW 'LATBOT))
  (LATLEFT (WINDOWPROP WINDOW 'LATLEFT))
  (LONLEFT (WINDOWPROP WINDOW 'LONLEFT))
  (MAINWINDOW (WINDOWPROP WINDOW 'MAINWINDOW))
  (MAP (WINDOWPROP MAINWINDOW 'MAP))
  (MAPX (WINDOWPROP MAINWINDOW 'MAPX))
  (MAPY (WINDOWPROP MAINWINDOW 'MAPY))
  (LAT (- (+ MAPY Y)
    MAP-BOTTOM-BEARING))
  (LONG (- (+ MAPX X)
    MAP-SIDE-BEARING))
  (BITBLT NIL NIL NIL WINDOW LATLEFT LATBOT (LOADTIMECONSTANT (STRINGWIDTH "00000 "
  (FONTCREATE 'MODERN 10)))
  100
  'TEXTURE
  'REPLACE WHITESHADE)

```

```
(BITBLT NIL NIL NIL WINDOW LONGLEFT LATBOT (LOADTIMECONSTANT (STRINGWIDTH "00000 "
                                                                    (FONTCREATE 'MODERN 10)))
      100
      'TEXTURE
      'REPLACE WHITESHADE)
(MOVETO LATLEFT LATBOT WINDOW)
(PRIN1 LAT WINDOW)
(MOVETO LONGLEFT LATBOT WINDOW)
(PRIN1 LONG WINDOW)))
```

(COORDW-BIT-REPAINTFN

```
(LAMBDA (WINDOW)
  ASDF))
```

)

:: Functions called to ADD and DELETE items from the map

(DEFINEQ

(MAPW-ADD-OBJECT

```
(LAMBDA (WINDOW OBJECT) ; Edited 10-Jun-93 19:50 by bane
  (LET ((MAPMARKS (WINDOWPROP WINDOW 'MAPMARKS))
        (UNPLACEDW (WINDOWPROP WINDOW 'MAPUNPLACED))
        UNPLACEDMARKS LASTMARK MARK MARKX MARKY)
    (COND
      ((|for| MARK |in| MAPMARKS |thereis| (EQ OBJECT (|fetch| (MAPMARK OBJECT) |of| MARK)))
        (ERROR "Adding object to a map twice!")))
      (COND
        ((|for| MARK |in| (SETQ UNPLACEDMARKS (WINDOWPROP UNPLACEDW 'MAPMARKS))
          |thereis| (EQ OBJECT (|fetch| (MAPMARK OBJECT) |of| MARK)))
          (ERROR "Adding object to a map twice!")))
        (SETQ LASTMARK (CAR (FLAST UNPLACEDMARKS)))
        (SETQ MARK (MAKE-MAPMARK OBJECT))
        (COND
          (LASTMARK (SETQ MARKX (IPLUS (|fetch| (REGION RIGHT) |of| (|fetch| (MAPMARK MARKREGION) |of| LASTMARK))
            8
            (|fetch| (MAPMARK HOTSPOTX) |of| MARK)))
            (SETQ MARKY 20)
            (MAPMARK-PLACE UNPLACEDW MARK MARKX MARKY 0 0))
          (T (SETQ MARKX (IMAX 50 (|fetch| (MAPMARK HOTSPOTX) |of| MARK)))
            (SETQ MARKY 20)
            (MAPMARK-PLACE UNPLACEDW MARK MARKX MARKY 0 0)))
          (WINDOWPROP UNPLACEDW 'MAPMARKS (NCONC1 UNPLACEDMARKS MARK))))))
```

(MAPW-DELETE-OBJECT

```
(LAMBDA (WINDOW OBJECT) ; Edited 10-Jun-93 16:52 by bane
  (LET ((UNPLACEDW (WINDOWPROP WINDOW 'MAPUNPLACED))
        MARKS)
    (|for| MARK |in| (SETQ MARKS (WINDOWPROP UNPLACEDW 'MAPMARKS)) |when| (EQ OBJECT (|fetch| (MAPMARK OBJECT)
      |of| MARK))
      |do| (MAPMARK-UNPLACE UNPLACEDW MARK 0 0)
        (_ OBJECT |SetLocation| NIL)
        (WINDOWPROP UNPLACEDW 'MAPMARKS (REMOVE MARK MARKS)))
    (|for| MARK |in| (SETQ MARKS (WINDOWPROP WINDOW 'MAPMARKS)) |when| (EQ OBJECT (|fetch| (MAPMARK OBJECT)
      |of| MARK))
      |do| (MAPMARK-UNPLACE WINDOW MARK 0 0)
        (_ OBJECT |SetLocation| NIL)
        (WINDOWPROP WINDOW 'MAPMARKS (REMOVE MARK MARKS))))))
```

)

(DEFINEQ

(MAPW-MAKE-LEFTMENU

```
(LAMBDA NIL ; Edited 10-Jun-93 21:20 by bane
  ;; Set up the MAPW left-button menu
  (SETQ *MAPW-LEFTBUTTON-MENU* (|create| MENU
    ITEMS _ *MAPW-LEFTBUTTON-ITEMS*)))
```

(MAPW-MAKE-MIDDLEMENU

```
(LAMBDA NIL ; Edited 10-Jun-93 22:15 by bane
  ;; Set up the MAPW middle-button menu
  (SETQ *MAPW-MIDDLEBUTTON-MENU* (|create| MENU
    ITEMS _ *MAPW-MIDDLEBUTTON-ITEMS*)))
```

(MAPW-MENU-WHENSELECTEDFN

```
(LAMBDA (MAINWINDOW ITEM) ; Edited 10-Jun-93 22:11 by bane
  ;; Handle menu requests for a map window.
  (SELECTQ ITEM
```

```
(|Lat/Long Window| ; Toggle the existence of the latitude/longitude display window.
  (LET ((COORDW (WINDOWPROP MAINWINDOW 'COORDW))
        (REG (WINDOWPROP MAINWINDOW 'REGION)))
    (COND
      (COORDW (DETACHWINDOW COORDW MAINWINDOW)
              (CLOSEW COORDW
                    (WINDOWPROP MAINWINDOW 'COORDW NIL)))
      (T (SETQ COORDW (COORDW-CREATE MAINWINDOW 'LATLONG)
                (WINDOWPROP MAINWINDOW 'COORDW COORDW))))))
(|Bit-offset Window| ; Toggle the existence of the latitude/longitude display window.
  (LET ((COORDW (WINDOWPROP MAINWINDOW 'COORDW))
        (REG (WINDOWPROP MAINWINDOW 'REGION)))
    (COND
      (COORDW (DETACHWINDOW COORDW MAINWINDOW)
              (CLOSEW COORDW
                    (WINDOWPROP MAINWINDOW 'COORDW NIL)))
      (T (SETQ COORDW (COORDW-CREATE MAINWINDOW 'BITS)
                (WINDOWPROP MAINWINDOW 'COORDW COORDW))))))
  NIL)))
)
```

```
(RPAQQ *MAPW-LEFTBUTTON-ITEMS* (|Lat/Long Window|))
```

```
(RPAQQ *MAPW-MIDDLEBUTTON-ITEMS* (|Bit-offset Window|))
```

```
(RPAQQ *MAPW-LEFTBUTTON-MENU* NIL)
```

```
(RPAQQ *MAPW-MIDDLEBUTTON-MENU* NIL)
```

```
(MAPW-MAKE-LEFTMENU)
```

```
(MAPW-MAKE-MIDDLEMENU)
```

:: Map references. Each reference is a map and coordinates within the map (in pixels) of the location.

:: You can get ranges and bearings between references.

```
(DECLARE\ : EVAL@COMPILE
```

```
(DATATYPE MAPREF (MAP PIXLAT PIXLONG))
```

```
(/DECLAREDATATYPE 'MAPREF ' (POINTER POINTER POINTER)
```

:: ---field descriptor list elided by lister---

```
' 6)
```

```
(DEFINEQ
```

(MAPREF-BEARING

```
(LAMBDA (MAPREF1 MAPREF2) ; Edited 4-Jun-93 16:57 by sybalsky:mv:envos
```

:: Compute the range from one map reference to another, regardless of bearing.

:: For now, the two map references must be on the same map -- there's no provision for cross-map ranging

```
(LET ((MAP1 (|fetch| (MAPREF MAP) |of| MAPREF1))
      (MAP2 (|fetch| (MAPREF MAP) |of| MAPREF2))
      ANGLE DX DY)
  (COND
    ((NEQ MAP1 MAP2)
     (ERROR "Bearings between refs on different maps not supported")))
    (SETQ DX (- (|fetch| (MAPREF PIXLONG) |of| MAPREF2)
               (|fetch| (MAPREF PIXLONG) |of| MAPREF1)))
    (SETQ DY (- (|fetch| (MAPREF PIXLAT) |of| MAPREF2)
               (|fetch| (MAPREF PIXLAT) |of| MAPREF1)))
    (COND
      ((ZEROP DX)
       (COND
         ((< DY 0)
          180)
         (T 0)))
      ((ZEROP DY)
       (COND
         ((< DX 0)
          270)
         (T 90)))
      ((< DX 0)
       (COND
         ((< DY 0)
          (+ 270 (ARCTAN (/ DY DX))))
         (T (- 270 (ARCTAN (/ DY DX))))))
      (T (- 90 (ARCTAN (/ DY DX))))))
```

(MAPREF-RANGE

```
(LAMBDA (MAPREF1 MAPREF2) ; Edited 4-Jun-93 17:00 by sybalsky:mv:envos
```

;; Compute the range from one map reference to another, regardless of bearing.
 ;; For now, the two map references must be on the same map -- there's no provision for cross-map ranging

```
(LET ((MAP1 (|fetch| (MAPREF MAP) |of| MAPREF1))
      (MAP2 (|fetch| (MAPREF MAP) |of| MAPREF2))
      (PIXPERYARD (|fetch| (MAP PIXPERYARD) |of| (|fetch| (MAPREF MAP) |of| MAPREF1)))
      DX DY)
      (COND
        ((NEQ MAP1 MAP2)
         (ERROR "Range between refs on different maps not supported")))
      (SETQ DX (- (|fetch| (MAPREF PIXLONG) |of| MAPREF1)
                 (|fetch| (MAPREF PIXLONG) |of| MAPREF2)))
      (SETQ DY (- (|fetch| (MAPREF PIXLAT) |of| MAPREF1)
                 (|fetch| (MAPREF PIXLAT) |of| MAPREF2)))
      (FQUOTIENT (SQRT (+ (TIMES DX DX)
                          (TIMES DY DY)))
                 PIXPERYARD)))
```

)

;; The window for unplaced assets.

(DEFINEQ

(UNPLACEDW-CREATE

(LAMBDA (REGION) ; Edited 10-Jun-93 16:41 by bane

;; Create a window for holding the unplaced assets of a scenario.

```
(LET ((WINDOW (CREATEW REGION "Unplaced Assets for this Scenario")))
      (* WINDOWPROP WINDOW (QUOTE REPAINTFN)
         (FUNCTION UNPLACEDW-REPAINTFN))
      (WINDOWPROP WINDOW 'BUTTONEVENTFN (FUNCTION UNPLACEDW-BUTTONFN))
      (DSEPERATION 'PAINT WINDOW)
      WINDOW)))
```

(UNPLACEDW-BUTTONFN

(LAMBDA (WINDOW) ; Edited 10-Jun-93 21:38 by bane

;; BUTTONEVENTFN for map windows.

```
(LET ((X (LASTMOUSEX WINDOW))
      (Y (LASTMOUSEY WINDOW))
      (MAPMARKS (WINDOWPROP WINDOW 'MAPMARKS))
      MARK)
      (COND
        ((MOUSESTATE (NOT (OR LEFT MIDDLE))) ; No buttons down.
         )
        ((MOUSESTATE LEFT) ; Left button went down
         (|while| (MOUSESTATE LEFT) |do|
          (SETQ X (LASTMOUSEX WINDOW))
          (SETQ Y (LASTMOUSEY WINDOW))
          (COND
            (*MAPW-MOVING-OBJECT* ; There's a mark being moved; This mouse click puts it in place.
             (LET ((LASTMARK (CAR (FLAST MAPMARKS)))
                   MARKX MARKY)
                 (COND
                  (LASTMARK (SETQ MARKX (IPLUS (|fetch| (REGION RIGHT) |of| (|fetch| (MAPMARK MARKREGION)
                                                                                   |of| LASTMARK)))
                                                8
                   (|fetch| (MAPMARK HOTSPOTX) |of| *MAPW-MOVING-OBJECT*)))
                  (SETQ MARKY 20)
                  (MAPMARK-PLACE WINDOW *MAPW-MOVING-OBJECT* MARKX MARKY 0 0))
                 (T (SETQ MARKX (IMAX 50 (|fetch| (MAPMARK HOTSPOTX) |of| *MAPW-MOVING-OBJECT*))
                     (SETQ MARKY 20)
                     (MAPMARK-PLACE WINDOW *MAPW-MOVING-OBJECT* MARKX MARKY 0 0)))
                 (WINDOWPROP WINDOW 'MAPMARKS (NCONC1 MAPMARKS *MAPW-MOVING-OBJECT*))
                 (SETQ *MAPW-MOVING-OBJECT* NIL)
                 (CURSOR T)))
             (T (LET ((MAPMARKS (WINDOWPROP WINDOW 'MAPMARKS)))
                   (SETQ MARK (|for| AMARK |in| MAPMARKS |suchthat| (INSIDE? (|fetch| (MAPMARK MARKREGION)
                                                                                   |of| AMARK)
                                                                              X Y))))
                 (CL:WHEN MARK
                  (MAPMARK-UNPLACE WINDOW MARK 0 0)
                  (SETQ *MAPW-MOVING-OBJECT* MARK)
                  (CURSOR (@ (|fetch| (MAPMARK OBJECT) |of| MARK)
                             |::move-cursor|))
                  (SETQ MAPMARKS (REMOVE MARK MAPMARKS))
                  (|for| AMARK |in| MAPMARKS |when| (> (|fetch| (REGION LEFT) |of| (|fetch| (MAPMARK MARKREGION)
                                                                                   |of| AMARK))
                                                         X)
                   |do| (MAPMARK-RELMOVE WINDOW AMARK (- -8 (|fetch| (REGION WIDTH)
                                                                                   |of| (|fetch| (MAPMARK MARKREGION)
                                                                                   |of| MARK))
                                                         0 0 0))
                  (WINDOWPROP WINDOW 'MAPMARKS MAPMARKS))))))
```

((MOUSESTATE MIDDLE) ; Middle button went down
)))))

)

:: Utility functions

(DEFINEQ

(SECONDS

(LAMBDA (DEG MIN SEC)
(+ SEC (TIMES 60 (+ MIN (TIMES 60 DEG))))))

)

:: HOLDS THE OBJECT BEING MOVED AROUND BY MOUSE ON THE MAP.

(RPAQ? *MAPW-MOVING-OBJECT* NIL)

:: A LIST OF ALL THE MAPS KNOWN TO THE SYSTEM:


(RPAQ? *MAPS* NIL)


(RPAQ? NIL NIL)


:: Object support for mappable items.


(RPAQQ MAPITEM-CURSOR-IMAGE )

(RPAQQ GENERIC-MAP-IMAGE )

(RPAQQ AMPHIB-CURSOR-IMAGE )

(RPAQQ RORO-CURSOR-IMAGE )

(RPAQQ ELCAS-CURSOR-IMAGE )

(RPAQQ CRANE-CURSOR-IMAGE )

(DEFCLASSES |LotsMappableItem|)