

File created: 31-Jul-2023 13:39:50 {WMEDLEY}<library>BIGBITMAPS.;13

edit by: rmk

changes to: (VARS BIGBITMAPSCOMS)
(FNS BIGBITMAPEQUAL)

previous date: 9-Jul-2022 09:41:26 {WMEDLEY}<library>BIGBITMAPS.;12

Read Table: XCL

Package: INTERLISP

Format: XCCS

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(RPAQQ **BIGBITMAPSCOMS**

```
((DECLARE\ : EVAL@COMPILE DONTCOPY (RECORDS BIGBM)
  (CONSTANTS (|\MaxBitMapHeight| 65535)
    (|\MaxBitMapWidth| 65535)
    (|\MaxBitMapWords| 131066))
  (MACROS |GetNewFragment|)
  (MACROS |\SFInvert|))
  (INITRECORDS BIGBM)
  (FNS BIGBITMAP BITBLT.BIGBM BITMAPCREATE.BIGBM BITMAPCREATE BITMAPCOPY BIGBITMAPEQUAL BLTSHADE.BIGBM
    BITBLT \ORG.BITBLT \BLTSHADE.DISPLAY \RESHOWBORDER1)
  (FNS \DRAWCIRCLE.BIGBM \FILLCIRCLE.BIGBM \DRAWELLIPSE.BIGBM \DRAWCURVE.BIGBM \DRAWLINE.BIGBM.DASH
    \DRAWLINE.BIGBM.NODASH)
  (FNS \GENERIC.DSPCREATE.DESTINATION.BITMAP?.BIGBM)
  (DECLARE\ : DONTEVAL@LOAD DOCOPY (P (MOVD '\GENERIC.DSPCREATE.DESTINATION.BITMAP?.BIGBM
    '\GENERIC.DSPCREATE.DESTINATION.BITMAP?)))
  (FNS DSPDESTINATION |\SFFixY| |\SFFixDestination| |\SFFixClippingRegion|)
  (FNS \SW2BM BITMAPHEIGHT BITMAPWIDTH |\SFFixFont| BITSPERPIXEL)
  (FNS COLORIZEBITMAP \BWTCOLORBLT UNCOLORIZEBITMAP)
  (DECLARE\ : DONTEVAL@LOAD DOCOPY (P (MOVD '\ORG.BITBLT 'ORG.BITBLT)
    (MOVD? 'BLTSHADE 'ORG.BLTSHADE)
    (MOVD 'BLTSHADE.BIGBM 'BLTSHADE)
    (MOVD 'BITBLT 'BKBITBLT))))))
```

(DECLARE\ : EVAL@COMPILE DONTCOPY

(DECLARE\ : EVAL@COMPILE

(DATATYPE BIGBM (BIGBMWIDTH BIGBMHEIGHT BIGBMLIST))
)

(/DECLAREDATATYPE 'BIGBM ' (POINTER POINTER POINTER)

;; ---field descriptor list elided by lister---
'6)

(DECLARE\ : EVAL@COMPILE

(RPAQQ |\MaxBitMapHeight| 65535)

(RPAQQ |\MaxBitMapWidth| 65535)

(RPAQQ |\MaxBitMapWords| 131066)

```
(CONSTANTS (|\MaxBitMapHeight| 65535)
  (|\MaxBitMapWidth| 65535)
  (|\MaxBitMapWords| 131066))
)
```

(DECLARE\ : EVAL@COMPILE

```
(PUTPROPS |GetNewFragment| MACRO ((LIST)
  (PROG1 (CAR LIST)
    (SETQ LIST (CDR LIST))))))
)
```

(DECLARE\ : EVAL@COMPILE

(PUTPROPS |\SFInvert| MACRO ((|BitMap| \y)

(* |corrects| |for| |the| |fact| |that| |alto| |bitmaps| |are| |stored| |with| 0,0 |as| |upper| |left| |while| |lisp| |bitmaps| |have| 0,0 |as|
|lower| |left|. |The| |correction| |is| |actually| |off| |by| |one| |(greater)| |because| |a |majority| |of| |the| |places| |that| |it| |is|
|called| |actually| |need| |one| |more| |than| |corrected| Y |value|.)

```
(IDIFFERENCE (|fetch| (BITMAP BITMAPHEIGHT) |of| |BitMap|)
  \y))
)
```

(/DECLAREDATATYPE 'BIGBM ' (POINTER POINTER POINTER)

;; ---field descriptor list elided by lister---

' 6)

(DEFINEQ

(BIGBITMAPP

(LAMBDA (X)
(TYPE? BIGBM X)))

; Edited 13-Jun-2021 13:27 by rmk:

(BITBLT.BIGBM

(LAMBDA (SRCE SRCELEFT SRCEBOTTOM DEST DESTLEFT DESTBOTTOM WIDTH HEIGHT SRCETYPE OPERATION TEXTURE
CLIPPINGREGION) ; Edited 24-Jan-91 11:19 by matsuda

(PROG (SRCEBMLIST DESTBMLIST SRCEBIGBMHEIGHT DESTBIGBMHEIGHT SRCETOP DESTTOP SRCEFRAG DESTFRAG SRCEFRAGTOP
DESTFRAGTOP SRCEFRAGBOTTOM DESTFRAGBOTTOM SRCE-H DEST-H H NEXT-S-TOP NEXT-D-TOP SBOTTOM DBOTTOM
)

(SETQ SRCETOP (IPLUS (OR SRCEBOTTOM (SETQ SRCEBOTTOM 0))
(OR HEIGHT (SETQ HEIGHT (BITMAPHEIGHT SRCE)))))
(SETQ DESTTOP (IPLUS (OR DESTBOTTOM (SETQ DESTBOTTOM 0))
HEIGHT))

(COND
((< DESTBOTTOM 0)
(SETQ HEIGHT (+ HEIGHT DESTBOTTOM))
(SETQ SRCEBOTTOM (- SRCEBOTTOM DESTBOTTOM))
(SETQ DESTBOTTOM 0)
(SETQ DESTTOP HEIGHT)))

(COND
((|type?| BIGBM SRCE)
(SETQ SRCEBMLIST (|fetch| (BIGBM BIGBMLIST) |of| SRCE))
(SETQ SRCEBIGBMHEIGHT (|fetch| (BIGBM BIGBMHEIGHT) |of| SRCE))
(SETQ SRCEFRAG (|GetNewFragment| SRCEBMLIST))
(SETQ SRCEFRAGTOP SRCEBIGBMHEIGHT)
(SETQ SRCEFRAGBOTTOM (- SRCEFRAGTOP (BITMAPHEIGHT SRCEFRAG)))
(|until| (< SRCEFRAGBOTTOM SRCETOP) |do| ;; Search the first fragment of SRCE bitmaps
(SETQ SRCEFRAG (|GetNewFragment| SRCEBMLIST))
(SETQ SRCEFRAGTOP SRCEFRAGBOTTOM)
(SETQ SRCEFRAGBOTTOM (- SRCEFRAGTOP (BITMAPHEIGHT SRCEFRAG))
))

(COND
(|type?| BIGBM DEST)
(PROG NIL
;; BIGBM to BIGBM case

(SETQ DESTBMLIST (|fetch| (BIGBM BIGBMLIST) |of| DEST))
(SETQ DESTBIGBMHEIGHT (|fetch| (BIGBM BIGBMHEIGHT) |of| DEST))
(SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
(SETQ DESTFRAGTOP DESTBIGBMHEIGHT)
(SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT DESTFRAG)))

LOOP
(|until| (<= DESTFRAGBOTTOM DESTTOP) |do| ;; Serch the first fragment of DEST bitmaps
(SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
(SETQ DESTFRAGTOP DESTFRAGBOTTOM)
(SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT
DESTFRAG))))

(COND
((<= SRCEFRAGBOTTOM SRCEBOTTOM)
(SETQ SRCE-H (- SRCETOP SRCEBOTTOM)))
(T (SETQ SRCE-H (- SRCETOP SRCEFRAGBOTTOM))))
(COND
((<= DESTFRAGBOTTOM DESTBOTTOM)
(SETQ DEST-H (- DESTTOP DESTBOTTOM)))
(T (SETQ DEST-H (- DESTTOP DESTFRAGBOTTOM))))
(SETQ H (MIN DEST-H SRCE-H) ; Decriments Height)
(SETQ NEXT-S-TOP (- SRCETOP H))
(SETQ NEXT-D-TOP (- DESTTOP H))
(SETQ SBOTTOM (- NEXT-S-TOP SRCEFRAGBOTTOM))
(SETQ DBOTTOM (- NEXT-D-TOP DESTFRAGBOTTOM))
(ORG.BITBLT SRCEFRAG SRCELEFT SBOTTOM DESTFRAG DESTLEFT DBOTTOM WIDTH H SRCETYPE
OPERATION TEXTURE CLIPPINGREGION)

(COND
((> (SETQ HEIGHT (- HEIGHT H))
0)
(SETQ SRCETOP NEXT-S-TOP)
(SETQ DESTTOP NEXT-D-TOP)
(COND
((<= NEXT-S-TOP SRCEFRAGBOTTOM)
(SETQ SRCEFRAG (|GetNewFragment| SRCEBMLIST))
(SETQ SRCEFRAGTOP SRCEFRAGBOTTOM)
(SETQ SRCEFRAGBOTTOM (- SRCEFRAGTOP (BITMAPHEIGHT SRCEFRAG)))))
(COND
((<= NEXT-D-TOP DESTFRAGBOTTOM)
(SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
(COND
((NOT DESTFRAG)
(RETURN)))
(SETQ DESTFRAGTOP DESTFRAGBOTTOM)

```

      (SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT DESTFRAG))))
      (GO LOOP)
      ;; I hate goto, but this is temporary one
    ))))
  (T (PROG NIL
      LOOP2
      (COND
        ((<= SRCEFRAGBOTTOM SRCEBOTTOM)
         ;; bottom edge
         (SETQ SRCE-H (- SRCETOP SRCEBOTTOM))
         ;; BIGBM to BITMAP case
        )
        (T (SETQ SRCE-H (- SRCETOP SRCEFRAGBOTTOM))))
      (SETQ H (MIN HEIGHT SRCE-H))
      (SETQ NEXT-S-TOP (- SRCETOP H))
      (SETQ NEXT-D-TOP (- DESTTOP H))
      (SETQ SBOTTOM (- NEXT-S-TOP SRCEFRAGBOTTOM))
      (ORG.BITBLT SRCEFRAG SRCELEFT SBOTTOM DEST DESTLEFT NEXT-D-TOP WIDTH H SRCETYPE
        OPERATION TEXTURE CLIPPINGREGION)
      (COND
        (> (SETQ HEIGHT (- HEIGHT H))
          0)
        (SETQ SRCETOP NEXT-S-TOP)
        (SETQ DESTTOP NEXT-D-TOP)
        (COND
          ((<= NEXT-S-TOP SRCEFRAGBOTTOM)
           (SETQ SRCEFRAG (|GetNewFragment| SRCEBMLIST))
           ;; Get next SRCE fragment
           (SETQ SRCEFRAGTOP SRCEFRAGBOTTOM)
           (SETQ SRCEFRAGBOTTOM (- SRCEFRAGTOP (BITMAPHEIGHT SRCEFRAG))))
          (GO LOOP2)
        )
        ;; I hate goto, but this is temporary one
      ))))
  (OR (|type?| BIGBM DEST))
  (PROG NIL
    (SETQ DESTBMLIST (|fetch| (BIGBM BIGBMLIST) |of| DEST))
    (SETQ DESTBIGMHEIGHT (|fetch| (BIGBM BIGBMHEIGHT) |of| DEST))
    (SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
    (SETQ DESTFRAGTOP DESTBIGMHEIGHT)
    (SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT DESTFRAG)))
    (|until| (< DESTFRAGBOTTOM DESTTOP) |do| ;; Serch the first fragment of DEST bitmaps
      (SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
      (SETQ DESTFRAGTOP DESTFRAGBOTTOM)
      (SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT
        DESTFRAG))))
    (COND
      ((<= DESTFRAGBOTTOM DESTBOTTOM)
       ;; bottom edge
       (SETQ DEST-H (- DESTTOP DESTBOTTOM))
       (T (SETQ DEST-H (- DESTTOP DESTFRAGBOTTOM))))
      LOOP3
      (COND
        ((<= DESTFRAGBOTTOM DESTBOTTOM)
         (SETQ DEST-H (- DESTTOP DESTBOTTOM))
         (T (SETQ DEST-H (- DESTTOP DESTFRAGBOTTOM))))
        (SETQ H (MIN DEST-H HEIGHT))
        (SETQ NEXT-S-TOP (- SRCETOP H))
        (SETQ NEXT-D-TOP (- DESTTOP H))
        (SETQ DBOTTOM (- NEXT-D-TOP DESTFRAGBOTTOM))
        (ORG.BITBLT SRCE SRCELEFT NEXT-S-TOP DESTFRAG DESTLEFT DBOTTOM WIDTH H SRCETYPE OPERATION
          TEXTURE CLIPPINGREGION)
        (COND
          (> (SETQ HEIGHT (- HEIGHT H))
            0)
          (SETQ DESTTOP NEXT-D-TOP)
          (SETQ SRCETOP NEXT-S-TOP)
          (COND
            ((<= NEXT-D-TOP DESTFRAGBOTTOM)
             (SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
             (SETQ DESTFRAGTOP DESTFRAGBOTTOM)
             (SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT DESTFRAG))))
            (GO LOOP3)
          )
          ;; I hate goto, but this is temporary one
        )
      ))))
  (T ;; Normal case, use BITBLT
    (ORG.BITBLT SRCE SRCELEFT SRCEBOTTOM DEST DESTLEFT DESTBOTTOM WIDTH HEIGHT SRCETYPE OPERATION

```

TEXTURE CLIPPINGREGION)))))

(BITMAPCREATE.BIGBM

```
(LAMBDA (WIDTH HEIGHT BITSPPERPIXEL) ; Edited 7-Sep-89 18:14 by takeshi
  (LET (H HLEFT BM BIGBM)
    (SETQ H (FLOOR (IQUOTIENT |\\MaxBitMapWords| WIDTH)
                  BITSPPERWORD)) ; slice should be a multiple of 16 so that textures tessellate nicely.
    (SETQ HLEFT HEIGHT)
    (SETQ BIGBM (|create| BIGBM))
    (|replace| (BIGBM BIGBMWIDTH) OF BIGBM WITH WIDTH)
    (|replace| (BIGBM BIGBMHEIGHT) OF BIGBM WITH HEIGHT)
    (|replace| (BIGBM BIGBMLIST) OF BIGBM WITH (|while| (IGREATERP HLEFT 0)
                                                       |collect| (SETQ BM (BITMAPCREATE WIDTH (MIN H HLEFT)
                                                                    BITSPPERPIXEL))
                                                       (SETQ HLEFT (- HLEFT H))
                                                       BM)))
    BIGBM)))
```

(BITMAPCREATE

```
(LAMBDA (WIDTH HEIGHT BITSPPERPIXEL) ; Edited 1-Nov-91 15:47 by jds
  (PROG (RW) ; creates a bitmap & bigbm data structure.
    (OR (AND (IGEQ WIDTH 0)
             (ILEQ WIDTH |\\MaxBitMapWidth|))
        (\\ILLEGAL.ARG WIDTH))
    (OR (AND (IGEQ HEIGHT 0)
             (ILEQ HEIGHT |\\MaxBitMapHeight|))
        (\\ILLEGAL.ARG HEIGHT))
    ;; WIDTH & HEIGHT are now known to be OK.
    (SETQ BITSPPERPIXEL (\\INSUREBITSPPERPIXEL BITSPPERPIXEL))
    (SETQ RW (FOLDHI (ITIMES WIDTH BITSPPERPIXEL)
                    BITSPPERWORD))
    (RETURN (COND
             ((NOT (IGREATERP (ITIMES RW HEIGHT)
                              |\\MaxBitMapWords|))
              (|create| BITMAP
                       BITMAPRASTERWIDTH _ RW
                       BITMAPWIDTH _ WIDTH
                       BITMAPHEIGHT _ HEIGHT
                       BITMAPBITSPPERPIXEL _ BITSPPERPIXEL
                       BITMAPBASE _ (\\ALLOCBLOCK (FOLDHI (ITIMES RW HEIGHT)
                                                         WORDSPERCELL)
                                                  NIL
                                                  (AND (NULL WINDFLG)
                                                       0))))
             (T (BITMAPCREATE.BIGBM WIDTH HEIGHT BITSPPERPIXEL))))))
```

(BITMAPCOPY

```
(LAMBDA (BITMAP) ; Edited 1-Nov-91 15:49 by jds
  ;; makes a copy of an existing BitMap
  (PROG (NEWBITMAP)
    (BITBLT BITMAP 0 0 (SETQ NEWBITMAP (BITMAPCREATE (BITMAPWIDTH BITMAP)
                                                       (BITMAPHEIGHT BITMAP)
                                                       (BITSPPERPIXEL BITMAP)))
            0 0 NIL NIL 'INPUT 'REPLACE 0)
    (RETURN NEWBITMAP)))
```

(BIGBITMAPEQUAL

```
(LAMBDA (BM1 BM2) ; Edited 31-Jul-2023 13:08 by rmk
  ;; Fields may not be SMALLP
  (AND (|type?| BIGBM |of| BM1)
        (|type?| BIGBM |of| BM2)
        (IEQP (|ffetch| (BIGBM BIGBMWIDTH) |of| BM1)
              (|ffetch| (BIGBM BIGBMWIDTH) |of| BM2))
        (IEQP (|ffetch| (BIGBM BIGBMHEIGHT) |of| BM1)
              (|ffetch| (BIGBM BIGBMHEIGHT) |of| BM2))
        (|for| B1 |in| (|ffetch| (BIGBM BIGBMLIST) |of| BM1) |as| B2 |in| (|ffetch| (BIGBM BIGBMLIST) |of| BM2)
          |always| (EQUALBITMAPP B1 B2))))
```

(BLTSHADE.BIGBM

```
(LAMBDA (TEXTURE DESTINATION DESTLEFT DESTBOTTOM WIDTH HEIGHT OPERATION CLIPPINGREGION) ; Edited 17-Oct-89 19:01 by takeshi
  (LET (H SLITHEIGHT)
    ;; Clippingregion is handled incorrectly (at least in the Y direction).
    (COND
     ((NOT (|type?| BIGBM DESTINATION))
      (ORG.BLTSHADE TEXTURE DESTINATION DESTLEFT DESTBOTTOM WIDTH HEIGHT OPERATION CLIPPINGREGION))
     (T (PROG (DESTTOP DESTBMLIST DESTBIGMHEIGHT DESTFRAG DESTFRAGTOP DESTFRAGBOTTOM DEST-H NEXT-D-TOP
```

```

        DBOTTOM)
    (SETQ DESTTOP (IPLUS DESTBOTTOM HEIGHT))
    (SETQ DESTBMLIST (|fetch| (BIGBM BIGBMLIST) |of| DESTINATION))
    (SETQ DESTBIGBMHEIGHT (|fetch| (BIGBM BIGBMHEIGHT) |of| DESTINATION))
    (SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
    (SETQ DESTFRAGTOP DESTBIGBMHEIGHT)
    (SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT DESTFRAG)))
LOOP
  (|until| (<= DESTFRAGBOTTOM DESTTOP) |do| ;; Serch the first fragment of DEST bitmaps
    (SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
    (SETQ DESTFRAGTOP DESTFRAGBOTTOM)
    (SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT
      DESTFRAG))))
  (COND
    ((<= DESTFRAGBOTTOM DESTBOTTOM)
      (SETQ DEST-H (- DESTTOP DESTBOTTOM)))
    (T (SETQ DEST-H (- DESTTOP DESTFRAGBOTTOM))))
  (SETQ NEXT-D-TOP (- DESTTOP DEST-H))
  (SETQ DBOTTOM (- NEXT-D-TOP DESTFRAGBOTTOM))
  (ORG.BLTSHADE TEXTURE DESTFRAG DESTLEFT DBOTTOM WIDTH DEST-H OPERATION CLIPPINGREGION)
  (COND
    ((> (SETQ HEIGHT (- HEIGHT DEST-H))
      0)
      (SETQ DESTTOP NEXT-D-TOP)
      (COND
        ((<= NEXT-D-TOP DESTFRAGBOTTOM)
          (SETQ DESTFRAG (|GetNewFragment| DESTBMLIST))
          (SETQ DESTFRAGTOP DESTFRAGBOTTOM)
          (SETQ DESTFRAGBOTTOM (- DESTFRAGTOP (BITMAPHEIGHT
            DESTFRAG))))
        (GO LOOP)
        ;; I hate goto, but this is temporary one
      )))
  ))))

```

(BITBLT

```

(LAMBDA (SOURCE SOURCELEFT SOURCEBOTTOM DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT SOURCETYPE
  OPERATION TEXTURE CLIPPINGREGION)
  (DECLARE (LOCALVARS . T))
  ;; IRM defined defaults
  (OR DESTINATIONLEFT (SETQ DESTINATIONLEFT 0))
  (OR DESTINATIONBOTTOM (SETQ DESTINATIONBOTTOM 0))
  (COND
    ((EQ SOURCETYPE 'TEXTURE)
      (COND
        ((|type?| BITMAP DESTINATION)
          (\\BLTSHADE.BITMAP TEXTURE DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT OPERATION
            CLIPPINGREGION))
        ((|type?| BIGBM DESTINATION)
          (BLTSHADE.BIGBM TEXTURE DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT OPERATION
            CLIPPINGREGION))
        (T (PROG ((STREAM (\\OUTSTREAMARG DESTINATION)))
          (RETURN (IMAGEOP 'IMBLTSHADE STREAM TEXTURE STREAM DESTINATIONLEFT DESTINATIONBOTTOM WIDTH
            HEIGHT OPERATION CLIPPINGREGION))))))
    (T (COND
      ((OR (|type?| BIGBM SOURCE)
        (|type?| BIGBM DESTINATION))
        (BITBLT.BIGBM SOURCE SOURCELEFT SOURCEBOTTOM DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH
          HEIGHT SOURCETYPE OPERATION TEXTURE CLIPPINGREGION))
      (T (ORG.BITBLT SOURCE SOURCELEFT SOURCEBOTTOM DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH
        HEIGHT SOURCETYPE OPERATION TEXTURE CLIPPINGREGION))))))

```

(\\ORG.BITBLT

```

(LAMBDA (SOURCE SOURCELEFT SOURCEBOTTOM DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT SOURCETYPE
  OPERATION TEXTURE CLIPPINGREGION)
  (DECLARE (LOCALVARS . T))
  ;; IRM defined defaults
  (OR DESTINATIONLEFT (SETQ DESTINATIONLEFT 0))
  (OR DESTINATIONBOTTOM (SETQ DESTINATIONBOTTOM 0))
  (COND
    ((EQ SOURCETYPE 'TEXTURE)
      (COND
        ((|type?| BITMAP DESTINATION)
          (\\BLTSHADE.BITMAP TEXTURE DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT OPERATION
            CLIPPINGREGION))
        ((|type?| BIGBM DESTINATION)
          (BLTSHADE.BIGBM TEXTURE DESTINATION DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT OPERATION
            CLIPPINGREGION))
        (T (PROG ((STREAM (\\OUTSTREAMARG DESTINATION)))
          (RETURN (IMAGEOP 'IMBLTSHADE STREAM TEXTURE STREAM DESTINATIONLEFT DESTINATIONBOTTOM WIDTH
            HEIGHT OPERATION CLIPPINGREGION))))))
    (T (PROG (SOURCEDD SOURCEBM CLIPPEDSOURCELEFT CLIPPEDSOURCEBOTTOM)
      (COND

```

; Edited 29-Jun-90 10:43 by matsuda

; Edited 24-Jul-90 16:34 by matsuda

```

((|type?| BITMAP SOURCE)
 (OR SOURCELEFT (SETQ SOURCELEFT 0))
 (OR SOURCEBOTTOM (SETQ SOURCEBOTTOM 0))
 (SETQ SOURCEBM SOURCE)
 (SETQ CLIPPEDSOURCELEFT SOURCELEFT)
 (SETQ CLIPPEDSOURCEBOTTOM SOURCEBOTTOM) ; limit the WIDTH and HEIGHT to the source size.
 (SETQ WIDTH (COND
   (WIDTH (IMIN WIDTH (IDIFFERENCE (|fetch| (BITMAP BITMAPWIDTH) |of| SOURCE)
   SOURCELEFT)))
   (T (|fetch| (BITMAP BITMAPWIDTH) |of| SOURCE))))
 (SETQ HEIGHT (COND
   (HEIGHT (IMIN HEIGHT (IDIFFERENCE (|fetch| (BITMAP BITMAPHEIGHT) |of| SOURCE)
   SOURCEBOTTOM)))
   (T (|fetch| (BITMAP BITMAPHEIGHT) |of| SOURCE))))
 (SETQ SOURCECDD (\\GETDISPLAYDATA SOURCE)
 (OR SOURCELEFT (SETQ SOURCELEFT (|fetch| (REGION LEFT) |of| (|ffetch| (\\DISPLAYDATA
   |DDClippingRegion|)
   |of| SOURCECDD))))
 (OR SOURCEBOTTOM (SETQ SOURCEBOTTOM (|fetch| (REGION BOTTOM) |of| (|ffetch| (\\DISPLAYDATA
   |DDClippingRegion|)
   |of| SOURCECDD))))
 ; do transformations coming out of source
 (SETQ SOURCEBM (|fetch| (\\DISPLAYDATA |DDDestination|) |of| SOURCECDD))
 (SETQ CLIPPEDSOURCELEFT (IMAX (SETQ SOURCELEFT (\\DSPTRANSFORMX SOURCELEFT SOURCECDD))
 (|fetch| (\\DISPLAYDATA |DDClippingLeft|) |of| SOURCECDD)))
 (SETQ CLIPPEDSOURCEBOTTOM (IMAX (SETQ SOURCEBOTTOM (\\DSPTRANSFORMY SOURCEBOTTOM SOURCECDD))
 (|fetch| (\\DISPLAYDATA |DDClippingBottom|) |of| SOURCECDD)))
 ; limit the WIDTH and HEIGHT by the source dimensions.
 (SETQ WIDTH (COND
   (WIDTH (IMIN WIDTH (IDIFFERENCE (|fetch| (\\DISPLAYDATA |DDClippingRight|)
   |of| SOURCECDD)
   CLIPPEDSOURCELEFT)))
   (T (IDIFFERENCE (|fetch| (\\DISPLAYDATA |DDClippingRight|) |of| SOURCECDD)
   CLIPPEDSOURCELEFT))))
 (SETQ HEIGHT (COND
   (HEIGHT (IMIN HEIGHT (IDIFFERENCE (|fetch| (\\DISPLAYDATA |DDClippingTop|)
   |of| SOURCECDD)
   CLIPPEDSOURCEBOTTOM)))
   (T (IDIFFERENCE (|fetch| (\\DISPLAYDATA |DDClippingTop|) |of| SOURCECDD)
   CLIPPEDSOURCEBOTTOM))))
 ; if texture is not given, use the display stream's.
 (OR TEXTURE (SETQ TEXTURE (|ffetch| (\\DISPLAYDATA |DDTexture|) |of| SOURCECDD))))
 (COND
   ((OR (IGEQ 0 WIDTH)
   (IGEQ 0 HEIGHT)) ; if either width or height is 0, don't do anything.
   (RETURN)))
 (RETURN (COND
   ((|type?| BITMAP DESTINATION)
   (COND
     ((WINDOWP SOURCE)
     ;; bring source window to the top. Note: this doesn't work if the user passes in a display stream onto the
     ;; screen instead of a window.
     (.WHILE.TOP.DS. (\\OUTSTREAMARG SOURCE)
       (\\BITBLT.BITMAP SOURCEBM SOURCELEFT SOURCEBOTTOM DESTINATION
       DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT SOURCECDD
       OPERATION TEXTURE CLIPPINGREGION CLIPPEDSOURCELEFT
       CLIPPEDSOURCEBOTTOM)))
     (T (PROG ((DESTNBITS (BITSPERPIXEL DESTINATION))
       (SRCNBITS (BITSPERPIXEL SOURCEBM)))
       (COND
         ((NOT (EQ SRCNBITS DESTNBITS))
         (COND
           ((EQ DESTNBITS 1)
           (SETQ SOURCEBM (UNCOLORIZEBITMAP SOURCEBM (COLORMAP SRCNBITS)))
           ))))
       (\\BITBLT.BITMAP SOURCEBM SOURCELEFT SOURCEBOTTOM DESTINATION DESTINATIONLEFT
       DESTINATIONBOTTOM WIDTH HEIGHT SOURCECDD OPERATION TEXTURE
       CLIPPINGREGION CLIPPEDSOURCELEFT CLIPPEDSOURCEBOTTOM))))
     (T (PROG (STREAM)
       (SETQ STREAM (\\OUTSTREAMARG DESTINATION))
       (COND
         ((AND (NEQ SOURCE DESTINATION)
         (WINDOWP SOURCE))
         ;; both source and destination are windows, see if they overlap and use an intermediate bitmap.
         ;; Note: this doesn't work if the user passes in a display stream onto the screen instead of a window.
         (COND
           ((WINDOWP DESTINATION)
           (COND
             ((WOVERLAPP SOURCE DESTINATION)
             (RETURN (PROG (SCRATCHBM)
               (.WHILE.TOP.DS. (\\OUTSTREAMARG SOURCE)
                 (BITBLT SOURCEBM SOURCELEFT SOURCEBOTTOM
                 (SETQ SCRATCHBM (BITMAPCREATE
                 WIDTH HEIGHT

```

```

                                (BITSPERPIXEL
                                SOURCEBM)))
                                0 0 WIDTH HEIGHT 'INPUT 'REPLACE))
(RETURN (BITBLT SCRATCHBM 0 0 STREAM
        DESTINATIONLEFT DESTINATIONBOTTOM
        WIDTH HEIGHT SOURCETYPE OPERATION
        TEXTURE CLIPPINGREGION))))))
; bring the source to the top. this should be done uninterruptably
; but is better than nothing.
(TOTOPW SOURCE))
(IMAGEOP 'IMBITBLT STREAM SOURCEBM SOURCELEFT SOURCEBOTTOM STREAM
        DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT SOURCETYPE OPERATION
        TEXTURE CLIPPINGREGION CLIPPEDSOURCELEFT CLIPPEDSOURCEBOTTOM))))))
)

```

(\\BLTSHADE.DISPLAY

```

(LAMBDA (TEXTURE STREAM DESTINATIONLEFT DESTINATIONBOTTOM WIDTH HEIGHT OPERATION CLIPPINGREGION)
; Edited 21-Dec-90 10:41 by matsuda
; BLTSHADE to a display stream

```

```

(DECLARE (LOCALVARS . T))
(PROG (|left| |top| |bottom| |right| DESTINATIONBITMAP DESTDD DESTINATIONNBITS)
      (SETQ DESTDD (|fetch| (STREAM IMAGEDATA) |of| STREAM))
      (SETQ DESTINATIONBITMAP (|fetch| (\\DISPLAYDATA |DDDestination|) |of| DESTDD))

```

:: bring it to top so that its TOTOPFNs will get called before the destination information is cached in case one of them moves, reshapes, etc. the window

:: We'd rather handle the slow case when we are interruptable, so we do it here as a heuristic. But we might get interrupted before we go interruptable, so we do it there too.

```

(\\INSURETOPWDS STREAM)
(SETQ DESTINATIONLEFT (\\DSPTRANSFORMX DESTINATIONLEFT DESTDD))
(SETQ DESTINATIONBOTTOM (\\DSPTRANSFORMY DESTINATIONBOTTOM DESTDD))
(PROGN
; compute limits based on clipping regions.

```

```

      (SETQ |left| (|fetch| (\\DISPLAYDATA |DDClippingLeft|) |of| DESTDD))
      (SETQ |bottom| (|fetch| (\\DISPLAYDATA |DDClippingBottom|) |of| DESTDD))
      (SETQ |right| (|fetch| (\\DISPLAYDATA |DDClippingRight|) |of| DESTDD))
      (SETQ |top| (|fetch| (\\DISPLAYDATA |DDClippingTop|) |of| DESTDD))
(COND

```

(CLIPPINGREGION ; hard case, two destination clipping regions: do calculations to merge them.

```

      (PROG (CRLEFT CRBOTTOM)
            (SETQ |left| (IMAX |left| (SETQ CRLEFT (\\DSPTRANSFORMX (|fetch| (REGION LEFT)
                                                                    |of| CLIPPINGREGION)
                                                                    DESTDD))))
            (SETQ |bottom| (IMAX |bottom| (SETQ CRBOTTOM (\\DSPTRANSFORMY
                                                                    (|fetch| (REGION BOTTOM)
                                                                    |of| CLIPPINGREGION)
                                                                    DESTDD))))
            (SETQ |right| (IMIN |right| (IPLUS CRLEFT (|fetch| (REGION WIDTH) |of|
                                                                    CLIPPINGREGION)
                                                                    ))))
            (SETQ |top| (IMIN |top| (IPLUS CRBOTTOM (|fetch| (REGION HEIGHT) |of|
                                                                    CLIPPINGREGION)
                                                                    ))))))

```

```
(SETQ DESTINATIONNBITS (BITSPERPIXEL DESTINATIONBITMAP))
```

:: left, right top and bottom are the limits in destination taking into account Clipping Regions. Clip to region in the arguments of this call.

```

(PROGN (SETQ |left| (IMAX DESTINATIONLEFT |left|))
      (SETQ |bottom| (IMAX DESTINATIONBOTTOM |bottom|))
(COND
      (WIDTH ; WIDTH is optional
        (SETQ |right| (IMIN (IPLUS DESTINATIONLEFT WIDTH)
                           |right|))))
(COND
      (HEIGHT ; HEIGHT is optional
        (SETQ |top| (IMIN (IPLUS DESTINATIONBOTTOM HEIGHT)
                          |top|))))))

```

```

(COND
  ((OR (ILEQ |right| |left|)
        (ILEQ |top| |bottom|))
; there is nothing to move.
  (RETURN)))

```

```

(SETQ TEXTURE (SELECTQ (TYPENAME TEXTURE)
                      (LITATOM (COND
                                ((NULL TEXTURE) ; NIL case. default texture to background texture.
                                 (|fetch| (\\DISPLAYDATA |DDTexture|) |of| DESTDD))
                                ((NOT (EQ DESTINATIONNBITS 1))
                                 ; should be a color name
                                 (OR (COLORNUMBERP TEXTURE DESTINATIONNBITS T)
                                     (\\ILLEGAL.ARG TEXTURE))))
                                (T (\\ILLEGAL.ARG TEXTURE))))
              ((SMALLP FIXP)
               (LOGAND TEXTURE (MAXIMUMSHADE DESTINATIONNBITS)))
              (BITMAP TEXTURE)
              (LISTP ; should be a list of levels rgb or hls.
               (OR (AND (NOT (EQ DESTINATIONNBITS 1))
                        (COLORNUMBERP TEXTURE DESTINATIONNBITS))
                   (\\ILLEGAL.ARG TEXTURE))))))

```

```

                (\\ILLEGAL.ARG TEXTURE)))
(COND
  (NOT (EQ DESTINATIONNBITS 1))
  (COND
    ((NOT (|type?| BIGBM DESTINATIONBITMAP))
     (SETQ |left| (ITIMES DESTINATIONNBITS |left|))
     (SETQ |right| (ITIMES DESTINATIONNBITS |right|)))
    (SETQ TEXTURE (COLORTEXTUREFROMCOLOR# TEXTURE DESTINATIONNBITS)))
  (.WHILE.TOP.DS. STREAM (COND
    ((NOT (|type?| BIGBM DESTINATIONBITMAP))
     (PROG (HEIGHT)
       (SETQ HEIGHT (IDIFFERENCE |top| |bottom|))
       (|replace| (PILOTBBT PBTWIDTH) |of| \\SYSPILOTTBBT |with| (IDIFFERENCE
         |right| |left|))
       (|replace| (PILOTBBT PBTHEIGHT) |of| \\SYSPILOTTBBT |with| HEIGHT)
       (\\BITBLTSUB \\SYSPILOTTBBT NIL |left| NIL DESTINATIONBITMAP |left|
        (|\\SFInvert| DESTINATIONBITMAP |top|)
        HEIGHT
        'TEXTURE
        (OR OPERATION (|fetch| (\\DISPLAYDATA DDOPERATION) |of| DESTDD))
        TEXTURE
        (ITIMES DESTINATIONNBITS (|fetch| (\\DISPLAYDATA DDXOFFSET)
          |of| DESTDD))
        (|fetch| (\\DISPLAYDATA DDYOFFSET) |of| DESTDD))))
      (T (PROG (HEIGHT)
        (SETQ HEIGHT (IDIFFERENCE |top| |bottom|))
        (BLTSHADE.BIGBM TEXTURE DESTINATIONBITMAP |left| |bottom|
         (IDIFFERENCE |right| |left|)
         (IDIFFERENCE |top| |bottom|)
         (OR OPERATION (|fetch| (\\DISPLAYDATA DDOPERATION)
           |of| DESTDD))
         CLIPPINGREGION))))))
  (RETURN T))))

```

(\\RESHOWBORDER1

(LAMBDA (NEWBORDER OLDBORDER WINDOW)

; Edited 26-Jul-90 12:52 by matsuda

;; redisplay the border of a window. Is called by RESHOWBORDER and RESHOWTITLE. It doesn't check for equality between the new and old borders because it is also used when a title is added or deleted.

```

(PROG ((REGION (|fetch| (WINDOW REG) |of| WINDOW))
  (OLDSAVE (|fetch| (WINDOW SAVE) |of| WINDOW))
  NUSAV DELTA NUWIDTH NUHEIGHT)
  (SETQ DELTA (IDIFFERENCE NEWBORDER OLDBORDER))
  (SETQ NUWIDTH (IPLUS (|fetch| (REGION WIDTH) |of| REGION)
    (ITIMES DELTA 2)))
  (SETQ NUHEIGHT (IDIFFERENCE (IPLUS (|fetch| (REGION HEIGHT) |of| (DSPCLIPPINGREGION NIL
    (|fetch| (WINDOW DSP) |of| WINDOW)))
    (ITIMES NEWBORDER 2))
    ((|fetch| (WINDOW WTITLE) |of| WINDOW)
     (DSPLINEFEED NIL (|fetch| (SCREEN SCTITLED) |of| (|fetch| (WINDOW SCREEN)
       |of| WINDOW))))
    (T 0)))
  (SETQ NUSAV (BITMAPCREATE NUWIDTH NUHEIGHT (BITSPERPIXEL OLDSAVE)))
  (.WHILE.TOP.DS. WINDOW ; Save window image
    (\\SW2BM (|fetch| (SCREEN SDESTINATION) |of| (|fetch| (WINDOW SCREEN) |of| WINDOW))
     REGION
     (|fetch| (WINDOW SAVE) |of| WINDOW) ; put new save image into window
     NIL)
    (|replace| (WINDOW SAVE) |of| WINDOW |with| NUSAV)
    (|replace| (WINDOW WBORDER) |of| WINDOW |with| NEWBORDER) ; create a region that corresponds to the old region with the new
    ; border.
    (|replace| (WINDOW REG) |of| WINDOW |with| (|create| REGION
     LEFT _ (IDIFFERENCE (|fetch| (REGION LEFT)
       |of| REGION)
     DELTA)
     BOTTOM _ (IDIFFERENCE (|fetch| (REGION BOTTOM)
       |of| REGION)
     DELTA)
     WIDTH _ NUWIDTH
     HEIGHT _ NUHEIGHT))
    (UPDATE/SCROLL/REG WINDOW) ; draw border in the new image.
    (SHOWFRAME WINDOW) ; copy the visible part from the old image into the new one.
    (BITBLT OLDSAVE OLDBORDER OLDBORDER NUSAV NEWBORDER NEWBORDER (IDIFFERENCE (BITMAPWIDTH
     OLDSAVE)
     (ITIMES 2 OLDBORDER))
     (|fetch| (REGION HEIGHT) |of| (DSPCLIPPINGREGION NIL (|fetch| (WINDOW DSP) |of| WINDOW)))
     'INPUT
     'REPLACE) ; put the new image up on the screen.
    (\\SW2BM (|fetch| (SCREEN SDESTINATION) |of| (|fetch| (WINDOW SCREEN) |of| WINDOW))
     (|fetch| (WINDOW REG) |of| WINDOW)
     (|fetch| (WINDOW SAVE) |of| WINDOW)
     NIL))))

```


(DEFINEQ

(\\DRAWCIRCLE.BIGBM

(LAMBDA (DISPLAYSTREAM CENTERX CENTERY RADIUS BRUSH DASHING) ; Edited 29-Jan-91 16:25 by matsuda

(DECLARE (LOCALVARS . T))

(PROG ((DD (|fetch| IMAGEDATA |of| DISPLAYSTREAM))

BITMAP)

(SETQ BITMAP (|fetch| (\\DISPLAYDATA |DDestination|) |of| DD))

(COND

((|type?| BIGBM BITMAP)

(PROG (BIGBMLIST HEIGHT BOTTOM BM |ClippingTop| |ClippingBottom| |CTop| |CBottom|)

(SETQ BIGBMLIST (|fetch| (BIGBM BIGBMLIST) |of| BITMAP))

(SETQ HEIGHT (BITMAPHEIGHT BITMAP))

(SETQ |ClippingTop| (|ffetch| (\\DISPLAYDATA |DDClippingTop|) |of| DD))

(SETQ |ClippingBottom| (|ffetch| (\\DISPLAYDATA |DDClippingBottom|) |of| DD))

(SETQ BM (|GetNewFragment| BIGBMLIST))

(|while| (AND BM (IGREATERP HEIGHT |ClippingBottom|))

|do| (SETQ BOTTOM (IDIFFERENCE HEIGHT (BITMAPHEIGHT BM)))

(SETQ |CTop| (COND

((IGREATERP |ClippingTop| HEIGHT)

(IDIFFERENCE HEIGHT BOTTOM))

(T (IDIFFERENCE |ClippingTop| BOTTOM))))

(COND

((IGEQ |CTop| 0)

(SETQ |CBottom| (COND

((ILESSP |ClippingBottom| BOTTOM)

0)

(T (IDIFFERENCE |ClippingBottom| BOTTOM))))

(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BM)

(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |CTop|)

(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |CBottom|)

(\\DRAWCIRCLE.DISPLAY DISPLAYSTREAM CENTERX (IDIFFERENCE CENTERY BOTTOM)

RADIUS BRUSH DASHING)

(SETQ BM (|GetNewFragment| BIGBMLIST))

(SETQ HEIGHT BOTTOM)))

(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BITMAP)

(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |ClippingTop|)

(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |ClippingBottom|)

(MOVETO CENTERX CENTERY DISPLAYSTREAM)

(RETURN NIL)))

(T (\\DRAWCIRCLE.DISPLAY DISPLAYSTREAM CENTERX CENTERY RADIUS BRUSH DASHING))))))

(\\FILLCIRCLE.BIGBM

(LAMBDA (DISPLAYSTREAM CENTERX CENTERY RADIUS TEXTURE)

(DECLARE (LOCALVARS . T))

; Edited 29-Jan-91 16:21 by matsuda

(COND

((OR (NOT (NUMBERP RADIUS))

(ILESSP (SETQ RADIUS (FIXR RADIUS))

0))

(\\ILLEGAL.ARG RADIUS))

(T (PROG ((DD (|fetch| IMAGEDATA |of| DISPLAYSTREAM))

BITMAP)

(SETQ BITMAP (|fetch| (\\DISPLAYDATA |DDestination|) |of| DD))

(COND

((|type?| BIGBM BITMAP)

(PROG (BIGBMLIST HEIGHT BOTTOM BM |ClippingTop| |ClippingBottom| |CTop| |CBottom|)

(SETQ BIGBMLIST (|fetch| (BIGBM BIGBMLIST) |of| BITMAP))

(SETQ HEIGHT (BITMAPHEIGHT BITMAP))

(SETQ |ClippingTop| (|ffetch| (\\DISPLAYDATA |DDClippingTop|) |of| DD))

(SETQ |ClippingBottom| (|ffetch| (\\DISPLAYDATA |DDClippingBottom|) |of| DD))

(SETQ BM (|GetNewFragment| BIGBMLIST))

(|while| (AND BM (IGREATERP HEIGHT |ClippingBottom|))

|do| (SETQ BOTTOM (IDIFFERENCE HEIGHT (BITMAPHEIGHT BM)))

(SETQ |CTop| (COND

((IGREATERP |ClippingTop| HEIGHT)

(IDIFFERENCE HEIGHT BOTTOM))

(T (IDIFFERENCE |ClippingTop| BOTTOM))))

(COND

((IGEQ |CTop| 0)

(SETQ |CBottom| (COND

((ILESSP |ClippingBottom| BOTTOM)

0)

(T (IDIFFERENCE |ClippingBottom| BOTTOM))))

(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BM)

(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |CTop|)

(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |CBottom|)

(\\FILLCIRCLE.DISPLAY DISPLAYSTREAM CENTERX (IDIFFERENCE CENTERY BOTTOM)

RADIUS TEXTURE)

(SETQ BM (|GetNewFragment| BIGBMLIST))

(SETQ HEIGHT BOTTOM)))

(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BITMAP)

(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |ClippingTop|)

(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |ClippingBottom|)

(MOVETO CENTERX CENTERY DISPLAYSTREAM)

(RETURN NIL)))

(T (\\FILLCIRCLE.DISPLAY DISPLAYSTREAM CENTERX CENTERY RADIUS TEXTURE))))))

(\\DRAWELLIPSE.BIGBM

(LAMBDA (DISPLAYSTREAM CENTERX CENTERY SEMIMINORRADIUS SEMIMAJORRADIUS ORIENTATION BRUSH DASHING)
(DECLARE (LOCALVARS . T) ; Edited 29-Jan-91 12:52 by matsuda

(PROG ((DD (|fetch| IMAGEDATA |of| DISPLAYSTREAM)
BITMAP))

(SETQ BITMAP (|fetch| (\\DISPLAYDATA |DDestination|) |of| DD))
(COND

((|type?| BIGBM BITMAP)

(PROG ((CENTERX (FIXR CENTERX))
(CENTERY (FIXR CENTERY))
(SEMIMINORRADIUS (FIXR SEMIMINORRADIUS))
(SEMIMAJORRADIUS (FIXR SEMIMAJORRADIUS)))

(COND

((OR (EQ 0 SEMIMINORRADIUS)
(EQ 0 SEMIMAJORRADIUS))

(MOVETO CENTERX CENTERY DISPLAYSTREAM)
(RETURN))

(PROG (BIGBMLIST HEIGHT BOTTOM BM YY1 YY2 |ClippingTop| |ClippingBottom| |CTop| |CBottom|)
(SETQ BIGBMLIST (|fetch| (BIGBM BIGBMLIST) |of| BITMAP))

(SETQ HEIGHT (BITMAPHEIGHT BITMAP))

(SETQ |ClippingTop| (|ffetch| (\\DISPLAYDATA |DDClippingTop|) |of| DD))

(SETQ |ClippingBottom| (|ffetch| (\\DISPLAYDATA |DDClippingBottom|) |of| DD))

(SETQ BM (|GetNewFragment| BIGBMLIST))

(|while| (AND BM (IGREATERP HEIGHT |ClippingBottom|))

|do| (SETQ BOTTOM (IDIFFERENCE HEIGHT (BITMAPHEIGHT BM)))

(SETQ |CTop| (COND

((IGREATERP |ClippingTop| HEIGHT)

(IDIFFERENCE HEIGHT BOTTOM))

(T (IDIFFERENCE |ClippingTop| BOTTOM))))

(COND

((IGEQT |CTop| 0)

(SETQ |CBottom| (COND

((ILESSP |ClippingBottom| BOTTOM)

0)

(T (IDIFFERENCE |ClippingBottom| BOTTOM))))

(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BM)

(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |CTop|)

(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |CBottom|)

(\\DRAWELLIPSE.DISPLAY DISPLAYSTREAM CENTERX (IDIFFERENCE CENTERY BOTTOM)

SEMIMINORRADIUS SEMIMAJORRADIUS ORIENTATION BRUSH DASHING)

(SETQ BM (|GetNewFragment| BIGBMLIST))

(SETQ HEIGHT BOTTOM))

(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BITMAP)

(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |ClippingTop|)

(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |ClippingBottom|)

(MOVETO CENTERX CENTERY DISPLAYSTREAM)

(RETURN NIL))

(T (\\DRAWELLIPSE.DISPLAY DISPLAYSTREAM CENTERX CENTERY SEMIMINORRADIUS SEMIMAJORRADIUS ORIENTATION
BRUSH DASHING))))))

(\\DRAWCURVE.BIGBM

(LAMBDA (DISPLAYSTREAM KNOTS CLOSED BRUSH DASHING)

(DECLARE (LOCALVARS . T)

; Edited 29-Jan-91 17:48 by matsuda

(PROG ((DD (|fetch| (STREAM IMAGEDATA) |of| DISPLAYSTREAM)
BITMAP))

(SETQ BITMAP (|fetch| (\\DISPLAYDATA |DDestination|) |of| DD))
(COND

((|type?| BIGBM BITMAP)

(PROG (BIGBMLIST HEIGHT BOTTOM BM |ClippingTop| |ClippingBottom| |CTop| |CBottom| POINTS)

(|for| KNOT |in| KNOTS |do| (OR (|type?| POSITION KNOT)

(ERROR "bad knot" KNOT)))

(SETQ BIGBMLIST (|fetch| (BIGBM BIGBMLIST) |of| BITMAP))

(SETQ HEIGHT (BITMAPHEIGHT BITMAP))

(SETQ |ClippingTop| (|ffetch| (\\DISPLAYDATA |DDClippingTop|) |of| DD))

(SETQ |ClippingBottom| (|ffetch| (\\DISPLAYDATA |DDClippingBottom|) |of| DD))

(SETQ BM (|GetNewFragment| BIGBMLIST))

(|while| (AND BM (IGREATERP HEIGHT |ClippingBottom|))

|do| (SETQ BOTTOM (IDIFFERENCE HEIGHT (BITMAPHEIGHT BM)))

(SETQ |CTop| (COND

((IGREATERP |ClippingTop| HEIGHT)

(IDIFFERENCE HEIGHT BOTTOM))

(T (IDIFFERENCE |ClippingTop| BOTTOM))))

(COND

((IGEQT |CTop| 0)

(SETQ |CBottom| (COND

((ILESSP |ClippingBottom| BOTTOM)

0)

(T (IDIFFERENCE |ClippingBottom| BOTTOM))))

(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BM)

(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |CTop|)

(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |CBottom|)

(SETQ POINTS (|for| KNOT |in| KNOTS |collect| (|create| POSITION

XCOORD _ (CAR KNOT)

```

                                YCOORD _ (DIFFERENCE (CDR KNOT)
                                BOTTOM)))
(\\DRAWCURVE.DISPLAY DISPLAYSTREAM POINTS CLOSED BRUSH DASHING)
(SETQ BM (|GetNewFragment| BIGBMLIST))
(SETQ HEIGHT BOTTOM)))
(|replace| (\\DISPLAYDATA |DDestination|) |of| DD |with| BITMAP)
(|replace| (\\DISPLAYDATA |DDClippingTop|) |of| DD |with| |ClippingTop|)
(|replace| (\\DISPLAYDATA |DDClippingBottom|) |of| DD |with| |ClippingBottom|)
(RETURN DISPLAYSTREAM))
(T (\\DRAWCURVE.DISPLAY DISPLAYSTREAM KNOTS CLOSED BRUSH DASHING))))))

```

(\\DRAWLINE.BIGBM.DASH

(LAMBDA (DISPLAYSTREAM X1 Y1 X2 Y2 BRUSH DASHING OPERATION) ; Edited 13-Jun-2021 14:02 by rmk:

```

(GLOBALRESOURCES \\BRUSHBTT (LET ((DD (|fetch| IMAGEDATA |of| DISPLAYSTREAM))
    BITMAP BIGBMLIST HEIGHT BOTTOM BM YY1 YY2 |ClippingTop| |ClippingBottom|
    |CTop| |CBottom|)
(SETQ BITMAP (|ffetch| |DDestination| |of| DD))
(SETQ BIGBMLIST (|fetch| (BIGBM BIGBMLIST) |of| BITMAP))
(SETQ HEIGHT (BITMAPHEIGHT BITMAP))
(SETQ |ClippingTop| (|ffetch| |DDClippingTop| |of| DD))
(SETQ |ClippingBottom| (|ffetch| |DDClippingBottom| |of| DD))
(SETQ BM (|GetNewFragment| BIGBMLIST))
(|while| (AND BM (IGREATERP HEIGHT |ClippingBottom|))
|do| (SETQ BOTTOM (IDIFFERENCE HEIGHT (BITMAPHEIGHT BM)))
(SETQ |CTop| (COND
((IGREATERP |ClippingTop| HEIGHT)
(IDIFFERENCE HEIGHT BOTTOM))
(T (IDIFFERENCE |ClippingTop| BOTTOM))))
(|if| (IGEQ |CTop| 0)
|then| (SETQ |CBottom| (COND
((ILESSP |ClippingBottom| BOTTOM)
0)
(T (IDIFFERENCE |ClippingBottom| BOTTOM)
))))
(|replace| |DDestination| |of| DD |with| BM)
(|replace| |DDClippingTop| |of| DD |with| |CTop|)
(|replace| |DDClippingBottom| |of| DD |with| |CBottom|)
(\\LINEWITHBRUSH X1 (IDIFFERENCE Y1 BOTTOM)
X2
(IDIFFERENCE Y2 BOTTOM)
BRUSH
(\\GOOD.DASHLST DASHING BRUSH)
DISPLAYSTREAM \\BRUSHBTT OPERATION)
(SETQ BM (|GetNewFragment| BIGBMLIST))
(SETQ HEIGHT BOTTOM)))
(|replace| |DDestination| |of| DD |with| BITMAP)
(|replace| |DDClippingTop| |of| DD |with| |ClippingTop|)
(|replace| |DDClippingBottom| |of| DD |with| |ClippingBottom|))))))

```

(\\DRAWLINE.BIGBM.NODASH

(LAMBDA (DISPLAYSTREAM X1 Y1 X2 Y2 WIDTH OPERATION COLOR) ; Edited 13-Jun-2021 13:59 by rmk:

```

(LET ((DD (|fetch| IMAGEDATA |of| DISPLAYSTREAM))
    BITMAP BIGBMLIST HEIGHT BOTTOM BM |CTop| |CBottom| |ClippingTop| |ClippingBottom| YY1 YY2)
(SETQ BITMAP (|ffetch| |DDestination| |of| DD))
(SETQ BIGBMLIST (|fetch| (BIGBM BIGBMLIST) |of| BITMAP))
(SETQ HEIGHT (BITMAPHEIGHT BITMAP))
(SETQ BM (|GetNewFragment| BIGBMLIST))
(SETQ |ClippingTop| (|ffetch| |DDClippingTop| |of| DD))
(SETQ |ClippingBottom| (|ffetch| |DDClippingBottom| |of| DD))
(SETQ YY1 (\\DSPTRANSFORMY (OR (FIXP Y1)
(FIXR Y1))
DD))
(SETQ YY2 (\\DSPTRANSFORMY (OR (FIXP Y2)
(FIXR Y2))
DD))
(|while| (AND BM (IGREATERP HEIGHT |ClippingBottom|))
|do| (SETQ BOTTOM (IDIFFERENCE HEIGHT (BITMAPHEIGHT BM)))
(SETQ |CTop| (COND
((IGREATERP |ClippingTop| HEIGHT)
(IDIFFERENCE HEIGHT BOTTOM))
(T (IDIFFERENCE |ClippingTop| BOTTOM))))
(COND
((IGEQ |CTop| 0)
(SETQ |CBottom| (COND
((ILESSP |ClippingBottom| BOTTOM)
0)
(T (IDIFFERENCE |ClippingBottom| BOTTOM))))
(\\CLIPANDDRAWLINE (\\DSPTRANSFORMX (OR (FIXP X1)
(FIXR X1))
DD)
(IDIFFERENCE Y1 BOTTOM)
(\\DSPTRANSFORMX (OR (FIXP X2)
(FIXR X2))
DD)
(IDIFFERENCE Y2 BOTTOM)

```

```
(COND
  ( (NULL WIDTH)
    1)
  (OR (FIXP WIDTH)
      (FIXR WIDTH)))
(SELECTQ OPERATION
  (NIL (|ffetch| DDOPERATION |of| DD))
  ((REPLACE PAINT INVERT ERASE)
   OPERATION)
  (\\ILLEGAL.ARG OPERATION))
BM
(|ffetch| |DDClippingLeft| |of| DD)
(SUB1 (|ffetch| |DDClippingRight| |of| DD))
|CBottom|
(SUB1 |CTop|)
DISPLAYSTREAM COLOR)))
(SETQ BM (|GetNewFragment| BIGBMLIST))
(SETQ HEIGHT BOTTOM))))
```

)

(DEFINEQ

(\\GENERIC.DSPCREATE.DESTINATION.BITMAP?.BIGBM

; Edited 9-Jul-2022 09:24 by rmk

```
(LAMBDA (DESTINATION)
  (\\DTEST (COND
    ((|type?| BIGBM DESTINATION)
     (CAR (|ffetch| (BIGBM BIGBMLIST) OF DESTINATION)))
    (T DESTINATION))
   'BITMAP)))
```

)

(DECLARE\ : DONTEVAL@LOAD DOCOPY

(MOVD ' \\GENERIC.DSPCREATE.DESTINATION.BITMAP?.BIGBM ' \\GENERIC.DSPCREATE.DESTINATION.BITMAP?)

)

(DEFINEQ

(DSPDESTINATION

; Edited 22-Sep-89 13:53 by takeshi

```
(LAMBDA (DESTINATION DISPLAYSTREAM)
  (DECLARE (GLOBALVARS \\DISPLAYIMAGEOPS \\4DISPLAYIMAGEOPS \\8DISPLAYIMAGEOPS \\24DISPLAYIMAGEOPS))
  (PROG (DD)
    (SETQ DD (\\GETDISPLAYDATA DISPLAYSTREAM DISPLAYSTREAM))
    (RETURN (PROG1 (|ffetch| (\\DISPLAYDATA |DDDestination|) |of| DD)
      (COND
        (DESTINATION
          ; (SETQ DESTINATION (OR (\\DTEST DESTINATION 'BITMAP)
          ; (\\DTEST DESTINATION 'BIGBM)))
          (COND
            ((|type?| BITMAP DESTINATION)
             (UNINTERRUPTABLY
              (|replace| (STREAM DEVICE) |of| DISPLAYSTREAM
                |with| (SELECTQ (|ffetch| (BITMAP BITMAPBITSERPPIXEL) |of| DESTINATION)
                  (1 |DisplayFDEV|)
                  (4 \\4DISPLAYFDEV)
                  (8 \\8DISPLAYFDEV)
                  (24 \\24DISPLAYFDEV)
                  (SHOULDNT)))
              (|replace| (STREAM IMAGEOPS) |of| DISPLAYSTREAM
                |with| (SELECTQ (|ffetch| (BITMAP BITMAPBITSERPPIXEL) |of| DESTINATION)
                  (1 \\DISPLAYIMAGEOPS)
                  (4 \\4DISPLAYIMAGEOPS)
                  (8 \\8DISPLAYIMAGEOPS)
                  (24 \\24DISPLAYIMAGEOPS)
                  (SHOULDNT)))
              (|freplace| (\\DISPLAYDATA |DDDestination|) |of| DD |with| DESTINATION)
              (|\\SFFixDestination| DD DISPLAYSTREAM)))
            ((|type?| BIGBM DESTINATION)
             (UNINTERRUPTABLY
              (|replace| (STREAM DEVICE) |of| DISPLAYSTREAM |with| \\8DISPLAYFDEV)
              ;; I'll add the bpp slot in BIGBM
              (|replace| (STREAM IMAGEOPS) |of| DISPLAYSTREAM |with| \\8DISPLAYIMAGEOPS)
              (|freplace| (\\DISPLAYDATA |DDDestination|) |of| DD |with| DESTINATION)
              (|\\SFFixDestination| DD DISPLAYSTREAM))))))))))
```

(|\\SFFixY|

; Edited 6-Jul-90 10:13 by matsuda

```
(LAMBDA (DISPLAYDATA CSINFO)
  ;; makes that part of the bitblt table of a display stream which deals with the Y information consistent. This is called from \\BLTCHAR whenever a
  ;; character is being printed and the charset/y-position caches are invalid ; assumes DISPLAYDATA has already been type checked.
  (PROG ((PBT (|ffetch| DDPILOTBTT |of| DISPLAYDATA))
    (Y (\\DSPTRANSFORMY (|ffetch| DDYPOSITION |of| DISPLAYDATA)
      DISPLAYDATA))
    TOP CHARTOP BM)
    (SETQ CHARTOP (IPLUS Y (|freplace| DDCHARSETASCENT |of| DISPLAYDATA |with| (|ffetch| CHARSETASCENT
```

```

(|of| CSINFO)))
(SETQ BM (|ffetch| |DDestination| |of| DISPLAYDATA))
(COND
  ((|type?| BIGBM BM)
   (SETQ TOP (IMAX (IMIN (|ffetch| |DDClippingTop| |of| DISPLAYDATA)
                        CHARTOP)
                  0))
   (|freplace| PBTDEST |of| PBT |with| NIL)
   (|freplace| PBTSOURCE |of| PBT |with| (\ADDBASE (|ffetch| BITMAPBASE |of| (SETQ BM (|ffetch| (CHARSETINFO
                                                                                               CHARSETBITMAP)
                                                                                               |of| CSINFO)))
      (ITIMES (|ffetch| BITMAPRASTERWIDTH |of| BM)
              (|freplace| DDCHARHEIGHTDELTA |of| DISPLAYDATA
                          |with| (IMIN (IMAX (IDIFFERENCE CHARTOP TOP)
                                          0)
                                      MAX.SMALL.INTEGER))))))
   (|freplace| PBTHEIGHT |of| PBT |with| (IMAX (IDIFFERENCE TOP (IMAX (IDIFFERENCE Y
                                                                    (|freplace| DDCHARSETDESCENT
                                                                    |of| DISPLAYDATA
                                                                    |with| (|ffetch| CHARSETDESCENT
                                                                    |of| CSINFO)))
                                              (|ffetch| |DDClippingBottom|
                                              |of| DISPLAYDATA)))
    0)))
  (T (|freplace| PBTDEST |of| PBT |with| (\ADDBASE (|ffetch| BITMAPBASE |of| BM)
          (ITIMES (|ffetch| BITMAPRASTERWIDTH |of| BM)
                  (|\SFInvert| BM
                   (SETQ TOP (IMAX (IMIN (|ffetch| |DDClippingTop|
                                          |of| DISPLAYDATA)
                                          CHARTOP)
                                    0))))))
     (|freplace| PBTSOURCE |of| PBT |with| (\ADDBASE (|ffetch| BITMAPBASE |of| (SETQ BM (|ffetch| (CHARSETINFO
                                                                                               CHARSETBITMAP)
                                                                                               |of| CSINFO)))
      (ITIMES (|ffetch| BITMAPRASTERWIDTH |of| BM)
              (|freplace| DDCHARHEIGHTDELTA |of| DISPLAYDATA
                          |with| (IMIN (IMAX (IDIFFERENCE CHARTOP TOP)
                                          0)
                                      MAX.SMALL.INTEGER))))))
     (|freplace| PBTHEIGHT |of| PBT |with| (IMAX (IDIFFERENCE TOP
          (IMAX (IDIFFERENCE Y (|freplace| DDCHARSETDESCENT
                              |of| DISPLAYDATA
                              |with| (|ffetch| CHARSETDESCENT
                              |of| CSINFO)))
              (|ffetch| |DDClippingBottom| |of| DISPLAYDATA)))
    0))))))

```

(|\SFFixDestination|

(LAMBDA (DISPLAYDATA DISPLAYSTREAM)

; Edited 6-Jul-90 13:55 by matsuda

;; fixes up those parts of the bitblt array which are dependent upon the destination

```

(PROG (PBT (|ffetch| (\DISPLAYDATA DDPILOTBBT) |of| DISPLAYDATA))
      (BM (|ffetch| (\DISPLAYDATA |DDestination|) |of| DISPLAYDATA))
      (|freplace| (PILOTBBT PBTDESTBPL) |of| PBT |with| (UNFOLD (COND
          ((|type?| BITMAP BM)
           (|ffetch| (BITMAP BITMAPRASTERWIDTH) |of| BM))
          (T (|ffetch| (BITMAP BITMAPRASTERWIDTH)
                     |of| (CAR (|ffetch| (BIGBM BIGBMLIST)
                                         OF BM))))))
          BITSPERWORD))

```

; line width information will be updated by \SFFixFont

```

(|\SFFixClippingRegion| DISPLAYDATA)
(|\INVALIDATEDISPLAYCACHE| DISPLAYDATA)
(|\SFFixFont| DISPLAYSTREAM DISPLAYDATA)
(RETURN)))

```

(|\SFFixClippingRegion|

(LAMBDA (DISPLAYDATA)

; Edited 6-Jul-90 13:55 by matsuda

;; compute the top, bottom, left and right edges of the clipping region in destination coordinates to save computation every BltChar and coordinate
;; transformation taking into account the size of the bit map as well as the clipping region.

```

(PROG ((CLIPREG (|ffetch| (\DISPLAYDATA |DDClippingRegion|) |of| DISPLAYDATA))
      (BM (|ffetch| (\DISPLAYDATA |DDestination|) |of| DISPLAYDATA))
      (|freplace| (\DISPLAYDATA |DDClippingRight|) |of| DISPLAYDATA
                  |with| (IMAX 0 (IMIN (\DSPTRANSFORMX (IPLUS (|ffetch| (REGION LEFT) |of| CLIPREG)
                                                         (|ffetch| (REGION WIDTH) |of| CLIPREG))
                                      DISPLAYDATA)
                              (BITMAPWIDTH BM))))
      (|freplace| (\DISPLAYDATA |DDClippingLeft|) |of| DISPLAYDATA
                  |with| (IMIN (IMAX (\DSPTRANSFORMX (|ffetch| (REGION LEFT) |of| CLIPREG)
                                                         DISPLAYDATA)
                              0)
                          MAX.SMALL.INTEGER))
      (|freplace| (\DISPLAYDATA |DDClippingTop|) |of| DISPLAYDATA

```

```

|with| (IMAX 0 (IMIN (|\DSPTRANSFORMY (IPLUS (|ffetch| (REGION BOTTOM) |of| CLIPREG)
(|ffetch| (REGION HEIGHT) |of| CLIPREG)
DISPLAYDATA)
(BITMAPHEIGHT BM)))
(|freplace| (|\DISPLAYDATA |DDClippingBottom|) |of| DISPLAYDATA
|with| (IMIN (IMAX (|\DSPTRANSFORMY (|ffetch| (REGION BOTTOM) |of| CLIPREG)
DISPLAYDATA)
0)
MAX.SMALL.INTEGER))))))

```

)

(DEFINEQ

(|\SW2BM

(LAMBDA (P PR Q QR)

; Edited 8-Sep-89 16:14 by takeshi

(* |Switches| |the| |areas| |of| P |and| Q |defined| |by| |the| |regions| PR |and| QR |respectively|)

(PROG (PL PH PW PB QL QH QW QB)

(COND

```

(PR (SETQ PL (|ffetch| (REGION LEFT) |of| PR))
(SETQ PB (|ffetch| (REGION BOTTOM) |of| PR))
(SETQ PH (|ffetch| (REGION HEIGHT) |of| PR))
(SETQ PW (|ffetch| (REGION WIDTH) |of| PR)))

```

(T (SETQ PL (SETQ PB 0))

(COND

```

((|type?| BITMAP P)
(SETQ PW (|ffetch| (BITMAP BITMAPWIDTH) |of| P))
(SETQ PH (|ffetch| (BITMAP BITMAPHEIGHT) |of| P)))
(T (SETQ PW (|ffetch| (BIGBM BIGBMWIDTH) |of| P))
(SETQ PH (|ffetch| (BIGBM BIGBMHEIGHT) |of| P))))))

```

(COND

```

(QR (SETQ QL (|ffetch| (REGION LEFT) |of| QR))
(SETQ QB (|ffetch| (REGION BOTTOM) |of| QR))
(SETQ QW (|ffetch| (REGION WIDTH) |of| QR))
(SETQ QH (|ffetch| (REGION HEIGHT) |of| QR)))

```

(T (SETQ QL (SETQ QB 0))

(COND

```

((|type?| BITMAP Q)
(SETQ QW (|ffetch| (BITMAP BITMAPWIDTH) |of| Q))
(SETQ QH (|ffetch| (BITMAP BITMAPHEIGHT) |of| Q)))
(T (SETQ QW (|ffetch| (BIGBM BIGBMWIDTH) |of| Q))
(SETQ QH (|ffetch| (BIGBM BIGBMHEIGHT) |of| Q))))))

```

(PROG ((CL (IMAX (IMINUS PL)

(IMINUS QL)

0))

(CB (IMAX (IMINUS PB)

(IMINUS QB)

0)))

(PROG ((XP (IPLUS CL PL))

(YP (IPLUS CB PB))

(XQ (IPLUS CL QL))

(YQ (IPLUS CB QB))

CW CH)

(SETQ CW (IMIN (COND

((|type?| BITMAP P)

(IDIFFERENCE (IMIN (|ffetch| (BITMAP BITMAPWIDTH) |of| P)
(IPLUS PL PW))

XP))

(T (IDIFFERENCE (IMIN (|ffetch| (BIGBM BIGBMWIDTH) |of| P)
(IPLUS PL PW))

XP)))

(COND

((|type?| BITMAP Q)

(IDIFFERENCE (IMIN (|ffetch| (BITMAP BITMAPWIDTH) |of| Q)
(IPLUS QL QW))

XQ))

(T (IDIFFERENCE (IMIN (|ffetch| (BIGBM BIGBMWIDTH) |of| Q)
(IPLUS QL QW))

XQ))))))

(SETQ CH (IMIN (IDIFFERENCE (IMIN (COND

((|type?| BITMAP P)

(|ffetch| (BITMAP BITMAPHEIGHT) |of| P))

(T (|ffetch| (BIGBM BIGBMHEIGHT) |of| P))
(IPLUS PB PH))

YP)

(IDIFFERENCE (IMIN (COND

((|type?| BITMAP Q)

(|ffetch| (BITMAP BITMAPHEIGHT) |of| Q))

(T (|ffetch| (BIGBM BIGBMHEIGHT) |of| Q))
(IPLUS QB QH))

YQ))))))

(UNINTERRUPTABLY

(BITBLT P XP YP Q XQ YQ CW CH 'INPUT 'INVERT)

(BITBLT Q XQ YQ P XP YP CW CH 'INPUT 'INVERT)

(BITBLT P XP YP Q XQ YQ CW CH 'INPUT 'INVERT))))))

(BITMAPHEIGHT

(LAMBDA (BITMAP)

; Edited 22-Sep-89 14:05 by takeshi

;; returns the height in pixels of a bitmap.

```
(COND
  ((|type?| BITMAP BITMAP)
   (|ffetch| (BITMAP BITMAPHEIGHT) |of| BITMAP))
  ((|type?| WINDOW BITMAP)
   (WINDOWPROP BITMAP 'HEIGHT))
  ((|type?| BIGBM BITMAP)
   (|ffetch| (BIGBM BIGBMHEIGHT) |of| BITMAP))
  (T (\ILLEGAL.ARG BITMAP))))
```

(BITMAPWIDTH

(LAMBDA (BITMAP)

; Edited 22-Sep-89 14:07 by takeshi

;; returns the width of a bitmap in pixels

```
(COND
  ((|type?| BITMAP BITMAP)
   (|ffetch| (BITMAP BITMAPWIDTH) |of| BITMAP))
  ((|type?| WINDOW BITMAP)
   (WINDOWPROP BITMAP 'WIDTH))
  ((|type?| BIGBM BITMAP)
   (|ffetch| (BIGBM BIGBMWIDTH) |of| BITMAP))
  (T (\ILLEGAL.ARG BITMAP))))
```

(\\SFFixFont|

(LAMBDA (DISPLAYSTREAM DISPLAYDATA)

; Edited 6-Jul-90 10:11 by matsuda

;; used to fix up those parts of the bitblt table which depend upon the FONT. DISPLAYDATA is the IMAGEDATA for DISPLAYSTREAM, for convenience.

```
(PROG (PILOTBBT (|ffetch| (\DISPLAYDATA DDPILOTBBT) |of| DISPLAYDATA))
      (FONT (|ffetch| (\DISPLAYDATA DDFONT) |of| DISPLAYDATA))
      (BITSERPPIXEL (BITSERPPIXEL (|ffetch| (\DISPLAYDATA |DDestination|) |of| DISPLAYDATA)))
      (|freplace| (\DISPLAYDATA |DDSlowPrintingCase|) |of| DISPLAYDATA
                 |with| (OR (NOT (EQ BITSERPPIXEL 1))
                             (NOT (EQ (|ffetch| (FONTDESCRIPTOR ROTATION) |of| FONT)
                                       0)))))
      (\INVALIDATEDISPLAYCACHE DISPLAYDATA)
      (\SFFIXLINELENGTH DISPLAYSTREAM)))
```

(BITSERPPIXEL

(LAMBDA (BITMAP)

; Edited 29-Jun-90 10:15 by matsuda

;; returns the height in pixels of a bitmap.

```
(COND
  ((|type?| BITMAP BITMAP)
   (|ffetch| (BITMAP BITMAPBITSERPPIXEL) |of| BITMAP))
  ((|type?| BIGBM BITMAP)
   (|ffetch| (BITMAP BITMAPBITSERPPIXEL) |of| (CAR (|ffetch| (BIGBM BIGBMLIST) |of| BITMAP))))
  ((|type?| SCREEN BITMAP)
   (BITSERPPIXEL (|ffetch| (SCREEN SCDESTINATION) |of| BITMAP)))
  ((|type?| WINDOW BITMAP)
   (BITSERPPIXEL (|ffetch| (WINDOW SCREEN) |of| BITMAP)))
  (ARRAYP BITMAP)
  (SELECTQ (ARRAYSIZE BITMAP)
    (256 8)
    (16 4)
    (LISPERROR "ILLEGAL ARG" BITMAP)))
  (T (LISPERROR "ILLEGAL ARG" BITMAP))))
```

; Consider array to be a colormap.

(DEFINEQ

(COLORIZEBITMAP

(LAMBDA (BITMAP 0COLOR 1COLOR BITSERPPIXEL)

; Edited 26-Oct-2021 14:23 by larry

; Edited 13-Jul-90 14:42 by matsuda

;; creates a copy of BITMAP that is in color form allowing BITSERPPIXEL per pixel. 0COLOR and 1COLOR are the color numbers that get translated from 0 and 1 respectively.

```
(PROG (COLORBITMAP)
      (SETQ COLORBITMAP (BITMAPCREATE (|ffetch| (BITMAP BITMAPWIDTH) |of| BITMAP)
                                       (|ffetch| (BITMAP BITMAPHEIGHT) |of| BITMAP)
                                       BITSERPPIXEL))
      (COND
        ((NOT (|type?| BIGBM COLORBITMAP))
         (\BWTOCOLORBLT BITMAP 0 0 COLORBITMAP 0 0 (|ffetch| (BITMAP BITMAPWIDTH) |of| BITMAP)
                       (|ffetch| (BITMAP BITMAPHEIGHT) |of| BITMAP)
                       (COLORNUMBERP 0COLOR BITSERPPIXEL)
                       (COLORNUMBERP 1COLOR BITSERPPIXEL)
                       BITSERPPIXEL))
```

```
(T (PROG (DESTBMLIST DESTBITMAP SOURCEBOOTOM)
  (SETQ DESTBMLIST (|fetch| (BIGBM BIGBMLIST) |of| COLORBITMAP))
  (SETQ DESTBM (|GetNewFragment| DESTBMLIST))
  (SETQ SOURCEBOOTOM (|fetch| (BITMAP BITMAPHEIGHT) |of| BITMAP))
  (|while| DESTBM |do| (SETQ DESTBMHEIGHT (|fetch| (BITMAP BITMAPHEIGHT) |of| DESTBM))
    (SETQ SOURCEBOOTOM (- SOURCEBOOTOM DESTBMHEIGHT))
    (\\BWTOCOLORBLT BITMAP 0 SOURCEBOOTOM DESTBM 0 0 (|fetch| (BITMAP
      BITMAPWIDTH
    )
    |of| BITMAP)
    DESTBMHEIGHT
    (COLORNUMBERP 0COLOR BITSPERPIXEL)
    (COLORNUMBERP 1COLOR BITSPERPIXEL)
    BITSPERPIXEL)
    (SETQ DESTBM (|GetNewFragment| DESTBMLIST))))))
(RETURN COLORBITMAP))))
```

(\\BWTOCOLORBLT

```
(LAMBDA (SOURCEBWM SLEFT SBOTTOM DESTCOLORBM DLEFT DBOTTOM WIDTH HEIGHT 0COLOR 1COLOR DESTNBITS)
  ; Edited 26-Oct-2021 14:36 by larry
  ; Edited 26-Oct-2021 14:32 by larry
  ; Edited 26-Oct-2021 14:26 by larry
  ; Edited 8-May-2021 22:31 by rmk:
```

;; blits from a black and white bitmap into a color bitmap which has DESTNBITS bits per pixel. DESTCOLORBM is a pointer to the color bitmap.
 ;; assumes all datatypes and bounds have been checked

```
(SELECTQ DESTNBITS
  (4 (PROG (MAP SRCBASE SRCHEIGHT SRCRW SRCWRD SRCOFFSET DESBASE DESHEIGHT DESRW DESWRD DESOFF NBITS
    DESALIGNLEFT SCR)
    (SETQ MAP (|fetch| (ARRAYP BASE) |of| (\\MAP4 0COLOR 1COLOR)))
    (SETQ SRCBASE (|fetch| (BITMAP BITMAPBASE) |of| SOURCEBWM))
    (SETQ SRCHEIGHT (|fetch| (BITMAP BITMAPHEIGHT) |of| SOURCEBWM))
    (SETQ SRCRW (|fetch| (BITMAP BITMAPRSTERWIDTH) |of| SOURCEBWM))
    (SETQ SRCWRD (FOLDLO SLEFT BITSPERWORD))
    (SETQ SRCOFFSET (MOD SLEFT BITSPERWORD))
    (SETQ DESBASE (|fetch| (BITMAP BITMAPBASE) |of| DESTCOLORBM))
    (SETQ DESHEIGHT (|fetch| (BITMAP BITMAPHEIGHT) |of| DESTCOLORBM))
    (SETQ DESRW (|fetch| (BITMAP BITMAPRSTERWIDTH) |of| DESTCOLORBM))
    (SETQ DESWRD (FOLDLO DLEFT 4))
    (SETQ DESOFF (MOD DLEFT 4))
    (SETQ NBITS 4))
```

;; DESTCOLORBM is used to allow one bit per pixel bitblt operations on the bitmap.

```
(COND
  ((NOT (EQ 0 DESOFF))
    ;; save the left bits of the destination bitmap so it can be word aligned.
    (SETQ SCR (BITMAPCREATE 4 HEIGHT 4))
    (BITBLT DESTCOLORBM (SETQ DESALIGNLEFT (LLSH DESWRD 2))
      DBOTTOM SCR 0 0 DESOFF HEIGHT 'INPUT 'REPLACE))
  (|for| LINECOUNTER |from| 1 |to| HEIGHT
    |do| ;; linecounter goes from 1 to height because bitmaps are stored internally with top first so subtracting height is
      ;; necessary to get offset of line and the 1 corrects for height difference.
      (\\4BITLINEBLT (\\ADDBASE SRCBASE (IPLUS (ITIMES (IDIFFERENCE SRCHEIGHT (IPLUS
        LINECOUNTER
        SBOTTOM))
        SRCRW)
        SRCOFFSET
        (\\ADDBASE DESBASE (IPLUS (ITIMES (IDIFFERENCE DESHEIGHT (IPLUS LINECOUNTER
        DBOTTOM))
        DESRW)
        DESWRD))
        WIDTH MAP 0COLOR 1COLOR))
```

```
(COND
  (DESALIGNLEFT
    ;; move the color bits to the right and restore the saved color bits.
    (BITBLT DESTCOLORBM DESALIGNLEFT DBOTTOM DESTCOLORBM (IPLUS DESALIGNLEFT DESOFF)
      DBOTTOM WIDTH HEIGHT 'INPUT 'REPLACE)
    (BITBLT SCR 0 0 DESTCOLORBM DESALIGNLEFT DBOTTOM DESOFF HEIGHT 'INPUT 'REPLACE))))
(8 (SUBRCALL COLORIZE-BITMAP SOURCEBWM SLEFT SBOTTOM DESTCOLORBM DLEFT DBOTTOM WIDTH HEIGHT 0COLOR
  1COLOR DESTNBITS))
(24 (PROG (SRCBASE SRCHEIGHT SRCRW DESBASE DESHEIGHT DESRW)
  (SETQ SRCBASE (|fetch| (BITMAP BITMAPBASE) |of| SOURCEBWM))
  (SETQ SRCHEIGHT (|fetch| (BITMAP BITMAPHEIGHT) |of| SOURCEBWM))
  (SETQ SRCRW (|fetch| (BITMAP BITMAPRSTERWIDTH) |of| SOURCEBWM))
  (SETQ DESBASE (|fetch| (BITMAP BITMAPBASE) |of| DESTCOLORBM))
  (SETQ DESHEIGHT (|fetch| (BITMAP BITMAPHEIGHT) |of| DESTCOLORBM))
  (SETQ DESRW (|fetch| (BITMAP BITMAPRSTERWIDTH) |of| DESTCOLORBM))
  (|for| LINECOUNTER |from| 1 |to| HEIGHT |do|
    ;; linecounter goes from 1 to height because bitmaps are stored internally with top first so subtracting
    ;; height is necessary to get offset of line and the 1 corrects for height difference.
    (\\24BITLINEBLT (\\ADDBASE SRCBASE
```



```

(ITIMES (IDIFFERENCE
        SRCHEIGHT
        (IPLUS LINECOUNTER
          SBOTTOM))
        SRCRW)
SLEFT
(\ADDBASE DESBASE
 (ITIMES (IDIFFERENCE DESHEIGHT
         (IPLUS LINECOUNTER
           DBOTTOM))
         DESRW))
DLEFT WIDTH 0COLOR 1COLOR)))

```

(SHOULDNT)))

(UNCOLORIZEBITMAP

(LAMBDA (BITMAP COLORMAP)

```

; Edited 26-Oct-2021 14:51 by larry
; Edited 26-Oct-2021 14:44 by larry
; Edited 26-Oct-2021 14:44 by larry
; Edited 13-Jul-90 16:54 by matsuda

```

```

(PROG (BITSPERPIXEL MAXCOLOR MAXX MAXY BWBITMAP TABLE RGB R G B BIT BASE BWBASE RASTERWIDTH BWRASTERWIDTH
      WORD)

```

```

  (SETQ MAXX (SUB1 (BITMAPWIDTH BITMAP)))
  (SETQ MAXY (SUB1 (BITMAPHEIGHT BITMAP)))
  (SETQ BITSPERPIXEL (BITSPERPIXEL BITMAP))
  (SETQ COLORMAP (OR COLORMAP (COLORMAP BITSPERPIXEL)))
  (SETQ MAXCOLOR (MAXIMUMCOLOR BITSPERPIXEL))
  (SETQ BWBITMAP (BITMAPCREATE (ADD1 MAXX)
                                (ADD1 MAXY)
                                1))

```

```

  (SETQ TABLE (\ALLOCBLOCK (FOLDHI (ADD1 MAXCOLOR)
                                    2)))

```

```

  (|for| I |from| 0 |to| MAXCOLOR |do| (SETQ RGB (ELT COLORMAP I))
    (SETQ R (|fetch| (RGB RED) |of| RGB))
    (SETQ G (|fetch| (RGB GREEN) |of| RGB))
    (SETQ B (|fetch| (RGB BLUE) |of| RGB))
    (SETQ BIT (IDIFFERENCE 1 (IQUOTIENT (IPLUS R G B)
                                         384)))
    (\PUTBASE TABLE I BIT))

```

(COND

```

  ((|type?| BITMAP BITMAP)
   (SETQ BASE (|fetch| (BITMAP BITMAPBASE) |of| BITMAP))
   (SETQ BWBASE (|fetch| (BITMAP BITMAPBASE) |of| BWBITMAP))
   (SETQ RASTERWIDTH (|fetch| (BITMAP BITMAPRASTERWIDTH) |of| BITMAP))
   (SETQ BWRASTERWIDTH (|fetch| (BITMAP BITMAPRASTERWIDTH) |of| BWBITMAP)))

```

(SELECTQ BITSPERPIXEL

```

  (4 (|for| Y |from| 0 |to| MAXY |do| (SETQ WORD 0)
    (|for| X |from| 0 |to| MAXX
      |do| (SETQ WORD (LOGOR (LLSH WORD 1)
                            (\GETBASE TABLE (\GETBASENYBBLE BASE X)
                                             )))
    ))

```

(COND

```

  ((EQ (LOGAND X 15)
       15)
   (\PUTBASE BWBASE (FOLDLO X 16)
                  WORD)
   (SETQ WORD 0)))

```

(COND

```

  ((NOT (EQ (LOGAND MAXX 15)
            15))
   (SETQ WORD (LLSH WORD (IDIFFERENCE 15 (LOGAND MAXX 15))))
   (\PUTBASE BWBASE (FOLDLO MAXX 16)
                  WORD)))

```

(COND

```

  ((NOT (EQ Y MAXY))
   (SETQ BASE (\ADDBASE BASE RASTERWIDTH))
   (SETQ BWBASE (\ADDBASE BWBASE BWRASTERWIDTH))))))

```

(8 (COND

```

  ((NOT (|type?| BIGBM BITMAP))
   (SUBRCALL UNCOLORIZE-BITMAP BITMAP BWBITMAP TABLE))
  (T (PROG (SRCBIGBMLIST (|fetch| (BIGBM BIGBMLIST) |of| BITMAP))
          SRCBITMAP
          (WIDTH (ADD1 MAXX))
          HEIGHT
          (DESBOTTOM (ADD1 MAXY))
          (TEMPBM (BITMAPCREATE (ADD1 MAXX)
                                (ADD1 MAXY)
                                1)))
    (SETQ SRCBITMAP (|GetNewFragment| SRCBIGBMLIST))
    (|while| SRCBITMAP |do| (SETQ DESBOTTOM (IDIFFERENCE DESBOTTOM
                                                         (SETQ HEIGHT (|fetch| (BITMAP
                                                         BITMAPHEIGHT
                                                         )
                                                         |of| SRCBITMAP))))
      (SUBRCALL UNCOLORIZE-BITMAP SRCBITMAP TEMPBM TABLE)
      (BITBLT TEMPBM 0 (IDIFFERENCE (ADD1 MAXY)
                                    HEIGHT)

```

BWBITMAP 0 DESTBOTTOM WIDTH HEIGHT 'INPUT 'REPLACE)
(SETQ SRCBITMAP (|GetNewFragment| SRCBIGBMLIST))))))

NIL)
(RETURN BWBITMAP))))

)

(DECLARE\ : DONTEVAL@LOAD DOCOPY

(MOVD ' \ \ORG.BITBLT 'ORG.BITBLT)

(MOVD? 'BLTSHADE 'ORG.BLTSHADE)

(MOVD 'BLTSHADE.BIGBM 'BLTSHADE)

(MOVD 'BITBLT 'BKBITBLT)

)

(PUTPROPS **BIGBITMAPS COPYRIGHT** ("Venue" 1991 1993 1994))

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