

File created: 16-Mar-2024 07:55:53 {WMEDLEY}<lispusers>tmax>TMAX-XREF.;7

edit by: rmk

changes to: (VARS XREF.DISPLAY.METHODS)
(FNS XREF.BUTTONEVENTINFN XREF.GETFN XREF.GET.TOOBJ)

previous date: 16-Mar-2024 07:52:25 {WMEDLEY}<lispusers>tmax>TMAX-XREF.;6

Read Table: XCL

Package: INTERLISP

Format: XCCS

(RPAQQ **TMAX-XREFCOMS**

```
(
; Developed under support from NIH grant RR-00785.
; Written by Frank Gilmurray and Sami Shaio.

;; An XREF is a general-purpose cross-referencing imageobject. In order to create an instance of an XREF one simply calls the function
;; XREF with a TAG that is supposed to link it with some imageobject that it is referencing. In order to add to the class of imageobjects that
;; can be referenced with XREF one uses the function XREF.ADD.DISPLAYFN with the type of the imageobject and a function that operates
;; on it to return some string that XREF will then display in the document.
```

;;; TMAX-XREFNIL Image Object functions

```
(FNS XREF XREFP XREF.DISPLAYFN XREF.IMAGEBOXFN XREF.PUTFN XREF.GETFN XREF.COPYFN XREF.BUTTONEVENTINFN
XREF.WHENDELETEDFN XREF.TEDIT-TO-TEX-FN)
(FNS XREF.GET.DISPLAY.TEXT XREF.GET.TOOBJ TSPOBJ.GETTYPE)
(FNS UPDATE.XREFS INSERT.REF GET.REF GET.REFERENCE.BY TSP.LIST.REFS TSP.GET.INCODE TSP.GETCODEVAL
TSP.PUTCODE)
```

;;; Functions for adding and retrieving the method for a given imageobject.

```
(FNS XREF.ADD.DISPLAYFN XREF.GET.DISPLAYFN)
```

;;; Examples of some XREF display methods.

```
(FNS NGROUP.XREF.DISPLAYFN NGROUP.XREF.DISPLAY.TEXT NOTE.XREF.DISPLAYFN)
(INITVARS (\XREFOBJ.IMAGEFNS (IMAGEFNSCREATE (FUNCTION XREF.DISPLAYFN)
(FUNCTION XREF.IMAGEBOXFN)
(FUNCTION XREF.PUTFN)
(FUNCTION XREF.GETFN)
(FUNCTION XREF.COPYFN)
(FUNCTION XREF.BUTTONEVENTINFN)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION XREF.GET.DISPLAY.TEXT))))
(UGLYVARS XREF.DISPLAY.METHODS)
(FILES (COMPILED SYSLOAD)
TMAX))
```

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;; An XREF is a general-purpose cross-referencing imageobject. In order to create an instance of an XREF one simply calls the function XREF with a
;; TAG that is supposed to link it with some imageobject that it is referencing. In order to add to the class of imageobjects that can be referenced with
;; XREF one uses the function XREF.ADD.DISPLAYFN with the type of the imageobject and a function that operates on it to return some string that
;; XREF will then display in the document.

;;; TMAX-XREFNIL Image Object functions

(DEFINEQ

(**XREF**

```
(LAMBDA (TAG) (* |fsg| "23-Jul-87 13:33")
```

```
(* |Returns| \a |new| XREF |imageobject|. |The| TAG |argument| |is| |obligatory| |and| |should| |be| |the| |tag| |that| |is| |used|
|to| |reference| |the| |object| |that| |this| XREF |object| |is| |referencing|.)
```

```
(LET ((NEWOBJ (IMAGEOBJCREATE TAG \XREFOBJ.IMAGEFNS)))
(IMAGEOBJPROP NEWOBJ 'TYPE 'XREF)
(IMAGEOBJPROP NEWOBJ 'TEDIT-TO-TEX-FN (FUNCTION XREF.TEDIT-TO-TEX-FN))
NEWOBJ))
```

(**XREFP**

```
(LAMBDA (OBJ) (* |ss:| "27-Jun-87 16:39")
```

```
(* |Test| |whether| |something| |is| |an| XREF |imageobject|.))
(AND (IMAGEOBJP OBJ)
(EQ (IMAGEOBJPROP OBJ 'TYPE)
```

'XREF)))

(XREF.DISPLAYFN

(LAMBDA (OBJ STREAM)

(* |fsg| "17-Sep-87 11:19")

(* |General| |purpose| |display| |function| |for| |an| XREF |imageobject|
|Relies| |on| XREF.GET.DISPLAY.TEXT |to| |get| |the| |actual| |text| |that| |must| |be| |displayed|.|)

(TMAX.SHADEOBJ OBJ STREAM)
(PRIN1 (XREF.GET.DISPLAY.TEXT OBJ)
STREAM))

(XREF.IMAGEBOXFN

(LAMBDA (OBJ STREAM)

(* |ss:| "27-Jun-87 16:39")

(* |Returns| |the| |size| |of| |an| XREF |imageobject| |based| |on| |the| |string| |that| |will| |be| |used| |to| |display| |it| |which| |is|
|found| |using| XREF.GET.DISPLAY.TEXT.)

(DSPFONT (CURRENT.DISPLAY.FONT STREAM)
STREAM)
(|create| IMAGEBOX
XSIZE _ (TEDIT.STRINGWIDTH (XREF.GET.DISPLAY.TEXT OBJ)
STREAM)
YSIZE _ (FONTPROP STREAM 'HEIGHT)
YDESC _ (FONTPROP STREAM 'DESCENT)
XKERN _ 0)))

(XREF.PUTFN

(LAMBDA (OBJ STREAM)

(* |fsg| "29-Jul-87 09:08")

(PRIN2 (LIST 'XREF (|fetch| OBJECTDATUM |of| OBJ)
(IMAGEOBJPROP OBJ 'REFERENCE.BY))
STREAM))

(XREF.GETFN

(LAMBDA (STREAM COPY.OBJECT)

; Edited 16-Mar-2024 07:49 by rmk
(* |fsg| "20-Aug-87 14:59")

(TSP.SETUP.FMMENU (\\TEDIT.PRIMARYW TEXTOBJ))
(LET* ((XREF.ARGS (OR COPY.OBJECT (CDR (READ STREAM))))
(XREF.OBJ (XREF (CAR XREF.ARGS))))
(IMAGEOBJPROP XREF.OBJ 'REFERENCE.BY (OR (CADR XREF.ARGS)
'|Value|))
XREF.OBJ)))

(XREF.COPYFN

(LAMBDA (IMAGE.OBJ SOURCE.STREAM TARGET.STREAM)

(* |fsg| "12-Aug-87 11:07")

(* * |Here| |to| COPY |an| XREF |Image| |Object|.)

(SELECTQ (IMAGESTREAMTYPE TARGET.STREAM)
(TEXT (LET ((TEXTOBJ (TEXTOBJ TARGET.STREAM)))
(APPLY* (IMAGEOBJPROP IMAGE.OBJ 'GETFN)
TARGET.STREAM
(LIST (|fetch| OBJECTDATUM |of| IMAGE.OBJ)
(IMAGEOBJPROP IMAGE.OBJ 'REFERENCE.BY))))))
(ERROR "Unknown TARGET stream type" (IMAGESTREAMTYPE TARGET.STREAM))))

(XREF.BUTTONEVENTINFN

(LAMBDA (XREFOBJ STREAM SELECTION RELX RELY WINDOW HOSTSTREAM BUTTON)

; Edited 16-Mar-2024 07:55 by rmk
; Edited 26-Dec-2023 11:56 by rmk
; Edited 9-Nov-97 08:09 by rmk:
(* |fsg| "29-Jul-87 16:43")

;;; Show what TAG is being referenced and how it is referenced.

(LET ((XREF.TAG (|fetch| OBJECTDATUM |of| XREFOBJ))
(XREF.DISPLAY (IMAGEOBJPROP XREFOBJ 'REFERENCE.BY)))
(TEDIT.PROMPTPRINT STREAM (CONCAT "Reference to \"XREF.TAG \" by \" XREF.DISPLAY)
T)
(AND (MOUSESTATE MIDDLE)
(SELECTQ (MENU (|create| MENU
TITLE _ (CONCAT XREF.TAG " Menu")
ITEMS _ '(|Find Definition| |Change Reference| |Change Display|)
CENTERFLG _ T))
(|Find Definition|
(LET ((DEF (TSP.LIST.OF.OBJECTS (TEXTOBJ HOSTSTREAM)
(FUNCTION (LAMBDA (OBJ TAG)
(AND (NUMBEROBJ OBJ)
(EQ TAG (IMAGEOBJPROP OBJ 'TAG))))
(IMAGEOBJPROP XREFOBJ 'OBJECTDATUM))))
(IF DEF

```

      THEN (CL:WHEN (CDR DEF)
                (TEDIT.PROMPTPRINT STREAM "NOTE: Reference has multiplied
                definitions!!" T))
      (TEDIT.SETSEL HOSTSTREAM (CADR (CAR DEF))
        1
        'RIGHT NIL T 'INVERTED)
      (AND NIL (TEDIT.SHOWSEL HOSTSTREAM T)
        (TEDIT.NORMALIZECARET HOSTSTREAM))
      (RETFROM (FUNCTION \\TEDIT.SELECT.LINE.SCANNER)
        (TEDIT.GETSEL HOSTSTREAM))
      ELSE (TEDIT.PROMPTPRINT STREAM "Reference has no definition!" T))
      NIL))
(|Change Reference|
  (LET ((NEW.REFERENCE (GET.REF WINDOW STREAM)))
    (AND NEW.REFERENCE (PROGN (|replace| OBJECTDATUM |of| XREFOBJ |with| NEW.REFERENCE)
      'CHANGED))))
(|Change Display|
  (PROGN (IMAGEOBJPROP XREFOBJ 'REFERENCE.BY (GET.REFERENCE.BY WINDOW T))
    (TEDIT.PROMPTPRINT STREAM "" T)
    'CHANGED))
NIL))))

```

(XREF.WHENDELETEDFN

(LAMBDA (IMOBJ TARG.WINDOW.STREAM)

; Edited 15-Jul-2023 10:48 by rmk
(* |fsg| "29-Jul-87 16:35")

;; Note that this function is NOT called when a Reference is deleted. It is called when a NGroup or Endnote is deleted.

```

(LET ((WINDOW (\\TEDIT.MAINW TARG.WINDOW.STREAM)))
  (TSP.PUTCODE (IMAGEOBJPROP IMOBJ 'TAG)
    NIL WINDOW)
  (AND (UPDATE? WINDOW)
    (UPDATE.XREFS WINDOW))))

```

(XREF.TEDIT-TO-TEX-FN

```

(LAMBDA (OBJ STREAM)
  (LET ((TOOBJ (XREF.GET.TOOBJ (IMAGEOBJPROP OBJ 'OBJECTDATUM))
    DATUM)
    (CL:WHEN (AND (SETQ DATUM (IMAGEOBJPROP TOOBJ 'OBJECTDATUM))
      TOOBJ)
      (PRIN3 "\\exref{" STREAM)
      (PRIN3 (CAR DATUM)
        STREAM)
      (PRIN3 (CADR DATUM)
        STREAM)
      (PRIN3 "}" STREAM)
      T))))

```

)

(DEFINEQ

(XREF.GET.DISPLAY.TEXT

(LAMBDA (OBJ)

(* |fsg| "29-Jul-87 09:30")

```

(* |This| |function| |will| |first| |lookup| |a| "TOOBJ" |,| |in| |other| |words| |,| |the| |imageobject| |that| |the| XREF |object| OBJ |is|
|referencing|. |Then| |,| |if| |there| |is| |such| |an| |object| |a| |suitable| XREF |display| |method| |is| |found| |using|
XREF.GET.DISPLAYFN. |If| |such| |a| |function| |is| |found| |,| |then| |it| |is| |applied| |to| TOOBJ |and| |a| |string| |to| |be|
|displayed| |is| |returned|. )

```

```

(LET ((TOOBJ (XREF.GET.TOOBJ (|fetch| OBJECTDATUM |of| OBJ)))
  (REFERENCE.BY (IMAGEOBJPROP OBJ 'REFERENCE.BY))
  SPECIFIC.DISPLAYFN)
  (COND
    (TOOBJ (COND
      ((SETQ SPECIFIC.DISPLAYFN (XREF.GET.DISPLAYFN TOOBJ))
        (APPLY* SPECIFIC.DISPLAYFN TOOBJ REFERENCE.BY))
      (T (RINGBELLS)
        (ERROR "Unknown XREF display method" (TSPOBJ.GETTYPE TOOBJ))
        "<Unknown Reference>"))
    (T (CONCAT "<Reference " (|fetch| OBJECTDATUM |of| OBJ)
      "/" REFERENCE.BY ">")))))

```

(XREF.GET.TOOBJ

(LAMBDA (TAG)

; Edited 16-Mar-2024 07:49 by rmk
(* |fsg| "13-Jul-87 11:13");; This function is called in a specific context where a reference must be displayed. It is called by an XREF object and should return the
;; IMAGEOBJECT that the XREF object is referencing.

```

(GETHASH TAG (WINDOWPROP (\\TEDIT.PRIMARYW TEXTOBJ)
  'TSP.CODE.ARRAY)))

```

(TSPOBJ.GETTYPE

(LAMBDA (OBJ)

(* |ss| "27-Jun-87 16:36")

```
(IMAGEOBJPROP OBJ 'TYPE)))
```

```
)
```

```
(DEFINEQ
```

(UPDATE.XREFS

```
(LAMBDA (WINDOW UNUPDATING?)
```

```
(* |fsg| "25-Sep-87 14:18")
```

```
(* * |Update| |all| |the| XREF |objects| |in| |the| |window|.|)
```

```
(LET ((STREAM (TEXTSTREAM WINDOW))
```

```
(REF.LIST (TSP.LIST.OF.OBJECTS (TEXTOBJ WINDOW)
```

```
(FUNCTION XREFP))))
```

```
(AND REF.LIST (LET ((TEXTOBJ (TEXTOBJ WINDOW))
```

```
(TEDIT.PROMPTPRINT STREAM (CONCAT (COND
```

```
(UNUPDATING? "Undoing Update of")
```

```
(T "Updating"))
```

```
" References...")
```

```
T)
```

```
(|for| REF |in| REF.LIST
```

```
|do| (LET ((REF.TAG (|fetch| OBJECTDATUM |of| (CAR REF))))
```

```
(COND
```

```
((OR UNUPDATING? (XREF.GET.TOOBJ REF.TAG))
```

```
(TEDIT.OBJECT.CHANGED STREAM (CAR REF)))
```

```
(T (PRINTOUT PROMPTWINDOW T (CONCAT "Undefined Reference to \"
```

```
REF.TAG "\", delete it or just
```

```
continte?")
```

```
T)
```

```
(FLASHWINDOW PROMPTWINDOW)
```

```
(SELECTQ (MENU (|create| MENU
```

```
TITLE _ ' |Undefined Ref|
```

```
ITEMS _ ' (|Delete| |Continue|)
```

```
CENTERFLG _ T))
```

```
(|Delete| (TEDIT.DELETE STREAM (CADR REF)
```

```
1))
```

```
NIL))))))
```

```
(TEDIT.PROMPTPRINT STREAM "done")))))))
```

(INSERT.REF

```
(LAMBDA (STREAM DISPLAY.PREV)
```

```
(* |fsg| "25-Sep-87 10:24")
```

```
(LET* ((WINDOW (\\TEDIT.MAINW STREAM))
```

```
(CODE (GET.REF WINDOW STREAM DISPLAY.PREV))
```

```
(REF (AND CODE (XREF CODE))))
```

```
(AND REF (PROGN (IMAGEOBJPROP REF 'REFERENCE.BY (GET.REFERENCE.BY WINDOW))
```

```
(TEDIT.INSERT.OBJECT REF STREAM))))))
```

(GET.REF

```
(LAMBDA (WINDOW STREAM DISPLAY.PREV)
```

```
(* |fsg| "2-Sep-87 11:24")
```

```
(* * |f DISPLAY.PREV |is| |non-NIL| |then| |get| |the| |Reference| TAG |from| |a| |menu.|
```

```
|Else| |prompt| |the| |user| |for| |the| TAG |name|.|)
```

```
(COND
```

```
(DISPLAY.PREV (LET ((PREVREFS (TSP.LIST.REFS WINDOW))
```

```
(COND
```

```
(PREVREFS (TEDIT.PROMPTPRINT STREAM "" T)
```

```
(MENU (|create| MENU
```

```
TITLE _ ' |Reference Tags|
```

```
ITEMS _ (SORT PREVREFS 'UALPHORDER)
```

```
MENUCOLUMNS _ (FIX (SQRT (LENGTH PREVREFS)))
```

```
CENTERFLG _ T))
```

```
(T (TEDIT.PROMPTPRINT STREAM "There are no References in this document." T))))
```

```
(T (MKATOM (TEDIT.GETINPUT STREAM "Reference to:"))))))
```

(GET.REFERENCE.BY

```
(LAMBDA (WINDOW ASK?)
```

```
; Edited 29-Sep-87 15:24 by fsg
```

```
(* * |Get| |the| "Reference By" |value| |from| |the| |FreeMenu.| |f ASK? |is| T |or| |the| |FreeMenu| |value| |is| "Ask" |then|
```

```
|pop| |up| |a| |menu| |to| |get| |Value| |or| |Number|.|)
```

```
(LET ((REFERENCE.BY (COND
```

```
(ASK? ' |Ask|)
```

```
(T (FM.ITEMPROP (FM.GETITEM 'DEFAULTREF NIL (WINDOWPROP WINDOW 'IMAGEOBJ.MENUW))
```

```
' LABEL))))))
```

```
(SELECTQ REFERENCE.BY
```

```
(|Ask| (OR (MENU (|create| MENU
```

```
TITLE _ ' |Reference By|
```

```
CENTERFLG _ T
```

```
ITEMS _ ' (|Value| |Page|)))
```

```
' |Value|))
```

```
REFERENCE.BY))))
```

(TSP.LIST.REFS

```
(LAMBDA (WINDOW) (* |ss:| "27-Jun-87 16:36")

(* * |Used| |to| |collect| |index| |references| |here| |but| |now| |use| INDEX.LIST.REFS |instead|.|)

(LET ((REFLIST NIL))
  (MAPHASH (WINDOWPROP WINDOW 'TSP.CODE.ARRAY)
    (FUNCTION (LAMBDA (VAL KY)
      (SETQ REFLIST (CONS KY REFLIST))))))
  REFLIST)))
```

(TSP.GET.INCODE

```
(LAMBDA (STREAM) (* |fsg| "4-Aug-87 16:13")

(* * |Get| |a| |new| |Tag| ID |and| |make| |sure| |it's| |not| |already| |defined|.|)

(LET ((TAG.ID (MKATOM (TEDIT.GETINPUT STREAM "Tag name:"))))
  (|while| (AND TAG.ID (TSP.GETCODEVAL TAG.ID (\\TEDIT.MAINW STREAM)))
    |do| (SETQ TAG.ID (MKATOM (TEDIT.GETINPUT STREAM (CONCAT TAG.ID " already exists...Tag name:")))))
  (OR TAG.ID (TEDIT.PROMPTPRINT STREAM "" T))
  TAG.ID)))
```

(TSP.GETCODEVAL

```
(LAMBDA (CODE WINDOW) (* |ss:| "27-Jun-87 16:35")
  (LET ((TSP.CODE.ARRAY (WINDOWPROP WINDOW 'TSP.CODE.ARRAY))
    (GETHASH CODE TSP.CODE.ARRAY)))
```

(TSP.PUTCODE

```
(LAMBDA (CODE VALUE WINDOW) (* |ss:| "27-Jun-87 16:36")
  (PUTHASH CODE VALUE (LIST (WINDOWPROP WINDOW 'TSP.CODE.ARRAY))))
)
```

;;; Functions for adding and retrieving the method for a given imageobject.

```
(DEFINEQ
```

(XREF.ADD.DISPLAYFN

```
(LAMBDA (OBJTYPE NAME.OF.FUNCTION) (* |edited:| "22-Jan-87 21:08")

(* |Adds| |an| XREF |display| |method| |for| |an| |imageobject| |of| |the| |given| |type|.|
|This| |means| |that| |the| |function| NAME.OF.FUNCTION |will| |be| |used| |to| |display| |text| |when| |an| XREF |object|
|references| |an| |imageobject| |of| |type| OBJTYPE.)

(PUTHASH OBJTYPE NAME.OF.FUNCTION XREF.DISPLAY.METHODS)))
```

(XREF.GET.DISPLAYFN

```
(LAMBDA (OBJ) (* |edited:| "22-Jan-87 21:11")
  (* |Returns| |the| XREF |display| |method| |for| |an| |imageobject|
  OBJ.)
  (GETHASH (|fetch| USE |of| (|fetch| OBJECTDATUM |of| OBJ))
    XREF.DISPLAY.METHODS)))
)
```

;;; Examples of some XREF display methods.

```
(DEFINEQ
```

(NGROUP.XREF.DISPLAYFN

```
(LAMBDA (NGROUP.OBJ REFERENCE.BY) (* |fsg| "29-Jul-87 10:25")

(* * |The| XREF |display| |method| |for| NGROUP |objects|. |If| |the| |NGroup| |has| |been| |updated| |and| |it| |has| |a| |trailing|
|delimiter|. |the| |delimiter| |is| |stripped| |off|.|)

(|with| NUMBEROBJ (|fetch| OBJECTDATUM |of| NGROUP.OBJ)
  (COND
    (UPDATED.OBJ (COND
      (EQ REFERENCE.BY ' |Page|)
      (COND
        (PAGE.NUMBER (MKSTRING PAGE.NUMBER))
        (T (CONCAT "<" (NGROUP.XREF.DISPLAY.TEXT TEMPLATE NUMSTRING)
          "/" REFERENCE.BY ">"))))
      (T (NGROUP.XREF.DISPLAY.TEXT TEMPLATE NUMSTRING))))
    (T (CONCAT "<" REF.TYPE "/" REFERENCE.BY ">")))))
```

(NGROUP.XREF.DISPLAY.TEXT

```
(LAMBDA (TEMPLATE NUMSTRING) (* |fsg| "29-Jul-87 10:24")

(* * |Return| |the| |display| |text| |value| |for| |an| |updated| |NGroup| |reference|.|)
```

```
(|with| NGTEMPLATE TEMPLATE (COND
  (NG.TEXT-AFTER (SUBSTRING NUMSTRING 1 (MINUS (ADD1 (NCHARS NG.TEXT-AFTER))))))
  (T NUMSTRING))))
```

(NOTE.XREF.DISPLAYFN

```
(LAMBDA (NOTE.OBJ REFERENCE.BY)
```

```
(* |fsg| "29-Jul-87 10:35")
```

```
(* * |The| XREF |display| |method| |for| |Endnote| |objects.| |f| |the| |ImageObj| |has| |not| |been| |updated| |yet,| |we| |enclose|
|it| |in| |angle| |brackets.|)
```

```
(|with| NUMBEROBJ (|fetch| OBJECTDATUM |of| NOTE.OBJ)
  (COND
    ((AND UPDATED.OBJ (OR (NEQ REFERENCE.BY ' |Page|)
      PAGE.NUMBER))
      (COND
        ((EQ REFERENCE.BY ' |Page|)
          (MKSTRING PAGE.NUMBER))
        (T (MKSTRING NUMSTRING))))
    (T (CONCAT "<" NUMSTRING "/" REFERENCE.BY ">")))))
```

```
)
```

(RPAQ? \XREFOBJ.IMAGEFNS

```
(IMAGEFNSCREATE (FUNCTION XREF.DISPLAYFN)
  (FUNCTION XREF.IMAGEBOXFN)
  (FUNCTION XREF.PUTFN)
  (FUNCTION XREF.GETFN)
  (FUNCTION XREF.COPYFN)
  (FUNCTION XREF.BUTTONEVENTINFN)
  (FUNCTION NIL)
  (FUNCTION NIL)
  (FUNCTION NIL)
  (FUNCTION NIL)
  (FUNCTION NIL)
  (FUNCTION NIL)
  (FUNCTION XREF.GET.DISPLAY.TEXT)))
```

```
(READVARS-FROM-STRINGS ' (XREF.DISPLAY.METHODS)
  "({H(24 ERROR) 2 NGROUP.XREF.DISPLAYFN NGROUP NOTE.XREF.DISPLAYFN NOTE })
  ")
```

```
(FILESLOAD (COMPILED SYSLOAD)
  TMAX)
```

FUNCTION INDEX

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\\XREFOBJ.IMAGEFNS6