

File created: 18-Feb-87 15:44:37 {SUMEX-AIM}PS:<TMAX.SOURCES>INDEX.;4

changes to: (FNS INSERT.KNOWN.INDEX)

previous date: 17-Feb-87 14:27:45 {SUMEX-AIM}PS:<GILMURRAY.LISP>INDEX.;5

Read Table: OLD-INTERLISP-FILE

Package: INTERLISP

Format: XCCS

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(RPAQQ INDEXCOMS

```
(( * Developed under support from NIH grant RR-00785.)
(* Written by Frank Gilmurray and Sami Shaio.)
(FNS INDEXOBJ INDEXOBJP INDEX.DISPLAYFN INDEX.IMAGEBOXFN INDEX.PUTFN INDEX.GETFN INDEX.BUTTONEVENTINFN
CHANGE.INDEX CHANGE.INDEXENTRY INDEX.WHENDELETEDFN)
(FNS ADD.NEW.INDEX INDEX.STRING INSERT.INDEX INSERT.INDEXENTRY GET.INDEXENTRY.NUMBER INSERT.KNOWN.INDEX
INDEX.LIST.REFS LIST.OF.INDEXENTRIES CREATE.INDEX.FILE VIEW.INDEX.FILE GET.INDEX.FILE
WRITE.INDEX.FILE WRITE.INDEX.PAGENUMBERS)
(RECORDS INDEX.ENTRY.RECORD))
```

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(DEFINEQ

(INDEXOBJ

[LAMBDA (KEY INDEXENTRY.PARMS)

(* fsg "15-Jan-87 09:53")

(* * Create an instance of an Index or IndexEntry imageobject. The difference between the two is the OBJECTDATUM. For a simple Index, OBJECTDATUM is NIL. For an IndexEntry, OBJECTDATUM is a record containing the Entry, Entry's font, and Number option. In either case, the INDEX.KEY property is the hash key and is also the text to index for a simple Index.)

```
(LET [(NEWOBJ (IMAGEOBJCREATE INDEXENTRY.PARMS (IMAGEFNSCREATE (FUNCTION INDEX.DISPLAYFN)
(FUNCTION INDEX.IMAGEBOXFN)
(FUNCTION INDEX.PUTFN)
(FUNCTION INDEX.GETFN)
(FUNCTION NIL)
(FUNCTION INDEX.BUTTONEVENTINFN)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION INDEX.WHENDELETEDFN)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)
(FUNCTION NIL)]
(IMAGEOBJPROP NEWOBJ 'INDEX.KEY KEY)
(IMAGEOBJPROP NEWOBJ 'TYPE 'INDEXOBJ)
NEWOBJ])
```

(INDEXOBJP

[LAMBDA (OBJ)

(* fsg "15-Jan-87 09:55")

(* * Tests an imageobject to see if it an Index or IndexEntry imageobject. By convention, testing functions for an imageobject are named <CONCAT type-of-imageobj "P" >.)

```
(AND OBJ (EQ (IMAGEOBJPROP OBJ 'TYPE)
'INDEXOBJ])
```

(INDEX.DISPLAYFN

[LAMBDA (OBJ STREAM)

(* fsg "17-Feb-87 10:18")

(* * Display an Index or IndexEntry imageobject. If the output is to the display imagestream, then just type Index or IndexEntry followed by their args. Otherwise the output is to a hardcopy imagestream. In this case type nothing and replace the CAR of the hash array entry with a list of page numbers in which this index entry appears. <CAR FORMATTINGSTATE> is the current TEdit page number iff doing a hardcopy.)

```
(LET ((WINDOW (CAR (fetch \WINDOW of TEXTOBJ)))
PGS/IMOBJS CURRENT.PAGE)
(SELECTQ (IMAGESTREAMTYPE STREAM)
(DISPLAY (PROGN (DSPFONT GP.DefaultFont STREAM)
(PRIN3 (INDEX.STRING OBJ)
STREAM)))
(PROGN (SETQ PGS/IMOBJS (GETHASH (MKATOM (IMAGEOBJPROP OBJ 'INDEX.KEY))
(WINDOWPROP WINDOW 'TSP.INDEX.ARRAY)))
(SETQ CURRENT.PAGE (CAR FORMATTINGSTATE))
(COND
[PGS/IMOBJS (COND
[(LISTP (CAR PGS/IMOBJS))
```


(CHANGE.INDEXENTRY

[LAMBDA (OBJ STREAM OBJDATUM)

(* fsg "15-Jan-87 11:17")

(* * Here when CHANGE buttoned inside an IndexEntry ImageObject.)

```
(LET ((WINDOW (\TEDIT.MAINW STREAM))
      NEWINDEX.KEY NEWINDEX.ENTRY NEWINDEX.FONT NEWINDEX.NUMBER)
  (COND
    ([SETQ NEWINDEX.KEY (MKATOM (TEDIT.GETINPUT STREAM (CONCAT "Change IndexEntry Key %"
                                                                (IMAGEOBJPROP OBJ 'INDEX.KEY)
                                                                "% " to: " ]
                                                                (fetch INDEX.ENTRY of OBJDATUM)
                                                                "% " to: " )))
      (SETQ NEWINDEX.ENTRY (OR (MKATOM (TEDIT.GETINPUT STREAM (CONCAT "Change IndexEntry Entry %"
                                                                (fetch INDEX.ENTRY of OBJDATUM)
                                                                "% " to: " )))
                              (fetch INDEX.ENTRY of OBJDATUM)))
      (TEDIT.PROMPTPRINT STREAM (CONCAT "Change IndexEntry Entry font %" (ABBREVIATE.FONT (fetch
                                                                                          INDEX.ENTRYFONT
                                                                                          of OBJDATUM
                                                                                          )))
                               "% " to...")
      T)
    (until (SETQ NEWINDEX.FONT (GET.TSP.FONT WINDOW (OR (fetch INDEX.ENTRYFONT of OBJDATUM)
                                                         GP.DefaultFont)))
           do (TEDIT.PROMPTPRINT STREAM "Invalid font specification...try again." T))
          (TEDIT.PROMPTPRINT STREAM (CONCAT "Change IndexEntry Number option %" (fetch INDEX.NUMBER
                                                                                       of OBJDATUM)
                                           "% " to...")
          T)
    (SETQ NEWINDEX.NUMBER (GET.INDEXENTRY.NUMBER WINDOW (fetch INDEX.NUMBER of OBJDATUM)))
    (TEDIT.PROMPTPRINT STREAM " " T)
    (LIST NEWINDEX.KEY (create INDEX.ENTRY.RECORD
                              INDEX.ENTRY _ NEWINDEX.ENTRY
                              INDEX.ENTRYFONT _ NEWINDEX.FONT
                              INDEX.NUMBER _ NEWINDEX.NUMBER)))
  (T (LIST NEWINDEX.KEY]))
```

(INDEX.WHENDELETEDFN

[LAMBDA (OBJ WINDOW)

(* fsg "15-Jan-87 11:30")

(* * Delete the selected Index or IndexEntry imageobject.)

```
(LET* ((INDEXKEY (IMAGEOBJPROP OBJ 'INDEX.KEY))
       (INDEX.ARRAY (WINDOWPROP WINDOW 'TSP.INDEX.ARRAY))
       (HASH.VALUE (GETHASH INDEXKEY INDEX.ARRAY)))
  (COND
    ([DREMOVE OBJ (COND
      ((fetch OBJECTDATUM of OBJ)
       (CADDR HASH.VALUE))
      (T (CADR HASH.VALUE)
        NIL)
      (T (DSUBST NIL (LIST OBJ)
                 HASH.VALUE)
        (PUTHASH INDEXKEY (COND
          ((OR (CADR HASH.VALUE)
              (CADDR HASH.VALUE))
           HASH.VALUE)
          (T NIL))
          INDEX.ARRAY))
        NIL]))
  )
```

(DEFINEQ

(ADD.NEW.INDEX

[LAMBDA (WINDOW INDEXKEY OBJ)

(* fsg "28-Jan-87 11:37")

(* * Add an Index or IndexEntry imageobject to our index array.
 If at least one already exists for this index key, then just append this imageobject to the list.
 Otherwise create a new array entry for this imageobject. The list contains three elements;
 a string, a list of Index imageobjects, and a list of IndexEntry imageobjects.)

```
(LET* ((CODE.ARRAY (WINDOWPROP WINDOW 'TSP.INDEX.ARRAY))
       (HASH.VALUE (GETHASH INDEXKEY CODE.ARRAY))
       (INDEX.OBJS (CADR HASH.VALUE))
       (ENTRY.OBJS (CADDR HASH.VALUE)))
  [COND
    [(fetch OBJECTDATUM of OBJ)
     (SETQ ENTRY.OBJS (APPEND ENTRY.OBJS (LIST OBJ)
                              (T (SETQ INDEX.OBJS (APPEND INDEX.OBJS (LIST OBJ)
                                                                (PUTHASH INDEXKEY (LIST ' "[Pages (?)]" INDEX.OBJS ENTRY.OBJS)
                                                                CODE.ARRAY))
    ]
```

(INDEX.STRING

[LAMBDA (OBJ) (* fsg "15-Feb-87 14:40")

(* Returns the display imagestream text for an Index or IndexEntry ImageObject.)

```
(LET ((OBJDATUM (fetch OBJECTDATUM of OBJ)
INDEXNUMBER)
(COND
[OBJDATUM (CONCAT "[Index Key=" (MKATOM (IMAGEOBJPROP OBJ 'INDEX.KEY))
",Entry="
(fetch INDEX.ENTRY of OBJDATUM)
(COND
((EQ (SETQ INDEXNUMBER (fetch INDEX.NUMBER of OBJDATUM)
'YES)
",Number]")
((NUMBERP INDEXNUMBER)
(CONCAT ",Number=" INDEXNUMBER ")]")
(T ")]")
(T (CONCAT "[Index " (MKATOM (IMAGEOBJPROP OBJ 'INDEX.KEY))
"]"])))
```

(INSERT.INDEX

[LAMBDA (STREAM WINDOW) (* fsg "15-Jan-87 11:37")

(* Process the "Index" function in the ImageObjects menu.)

```
(LET [(NEWINDEX.KEY (MKATOM (TEDIT.GETINPUT STREAM "Index Key: ")
(TEDIT.PROMPTPRINT STREAM " " T)
(AND NEWINDEX.KEY (LET ((NEW.INDEX.OBJ (INDEXOBJ NEWINDEX.KEY)))
(ADD.NEW.INDEX WINDOW NEWINDEX.KEY NEW.INDEX.OBJ)
(TEDIT.INSERT.OBJECT NEW.INDEX.OBJ STREAM]))
```

(INSERT.INDEXENTRY

[LAMBDA (STREAM WINDOW) (* fsg "15-Jan-87 11:39")

(* Process the "IndexEntry" function in the ImageObjects menu.)

```
(LET ((NEWINDEX.KEY (MKATOM (TEDIT.GETINPUT STREAM "IndexEntry Key: ")))
NEWINDEX.ENTRY NEWINDEX.FONT NEWINDEX.NUMBER)
(COND
(NEWINDEX.KEY (SETQ NEWINDEX.ENTRY (OR (MKATOM (TEDIT.GETINPUT STREAM "IndexEntry Entry: "
(MKSTRING NEWINDEX.KEY)))
NEWINDEX.KEY))
(TEDIT.PROMPTPRINT STREAM "IndexEntry Entry font..." T)
(until (SETQ NEWINDEX.FONT (GET.TSP.FONT WINDOW GP.DefaultFont))
do (TEDIT.PROMPTPRINT STREAM "Invalid font specification...try again." T))
(TEDIT.PROMPTPRINT STREAM "IndexEntry Number option..." T)
(SETQ NEWINDEX.NUMBER (GET.INDEXENTRY.NUMBER WINDOW))
(TEDIT.PROMPTPRINT STREAM " " T)
(LET [(NEW.INDEX.OBJ (INDEXOBJ NEWINDEX.KEY
(create INDEX.ENTRY.RECORD
INDEX.ENTRY _ NEWINDEX.ENTRY
INDEX.ENTRYFONT _ NEWINDEX.FONT
INDEX.NUMBER _ NEWINDEX.NUMBER]
(ADD.NEW.INDEX WINDOW NEWINDEX.KEY NEW.INDEX.OBJ)
(TEDIT.INSERT.OBJECT NEW.INDEX.OBJ STREAM)))
(T (TEDIT.PROMPTPRINT STREAM " " T))
```

(GET.INDEXENTRY.NUMBER

[LAMBDA (WINDOW DEFAULTNUMBER) (* fsg "15-Jan-87 11:43")

(* Get the NUMBER argument for an IndexEntry ImageObject. The NUMBER can be "YES", "NO", or an integer.)

```
(OR [MENU (create MENU
TITLE _ "NUMBER?"
CENTERFLG _ T
ITEMS _ ' (YES NO VALUE)
WHENSELECTEDFN _ (FUNCTION (LAMBDA (ITEM)
(COND
((EQ ITEM 'VALUE)
(NUMBERPAD.READ (CREATE.NUMBERPAD.READER "NUMBER value?"
NIL NIL NIL T)))
(T ITEM)
DEFAULTNUMBER ' YES])
```

(INSERT.KNOWN.INDEX

[LAMBDA (STREAM WINDOW) (* fsg "18-Feb-87 14:48")

(* Process the "Known Indices" function in the ImageObjects menu. A menu of all the known indices and IndexEntries pops up and the user may button one of these to insert the corresponding Index or IndexEntry. Any buttoning outside of this menu will make it disappear.)

```
(LET* [(PREVINDICES (INDEX.LIST.REFS WINDOW))
```

```
(NEWINDEX.KEY (COND
  [PREVINDICES (LET ((NMENU (create MENU
    TITLE _ "Index Keys"
    ITEMS _ PREVINDICES))
    MENU.SELECTION)
    (SETQ MENU.SELECTION (MENU NMENU))
    (AND MENU.SELECTION (OR (LISTP MENU.SELECTION)
      (LIST MENU.SELECTION))
    T)
  (T (TEDIT.PROMPTPRINT STREAM "There are no Indices/IndexEntries in this document."
    T)
  NIL])
(AND NEWINDEX.KEY (LET ((NEWINDEX.OBJ (APPLY 'INDEXOBJ NEWINDEX.KEY)))
  (ADD.NEW.INDEX WINDOW (CAR NEWINDEX.KEY)
    NEWINDEX.OBJ)
  (TEDIT.INSERT.OBJECT NEWINDEX.OBJ STREAM)
  (TEDIT.PROMPTPRINT STREAM "" T]))
```

(INDEX.LIST.REFS

[LAMBDA (WINDOW) (* fsg "15-Jan-87 11:46")

(* * Return a sorted list of the Index and IndexEntry keys. Simple Index keys are just added to the list. For an IndexEntry key, there are SUBITEMS for each IndexEntry for this key. This list can be used as the ITEMS field in the Known Indices menu or for creating the index file.)

```
(LET ((INDEX.ARRAY (WINDOWPROP WINDOW 'TSP.INDEX.ARRAY))
  (INDEX.KEYLIST NIL)
  (INDEX.ITEMS (CONS)
  INDEX.VALUE)
  [MAPHASH INDEX.ARRAY (FUNCTION (LAMBDA (VAL KY)
    (SETQ INDEX.KEYLIST (CONS KY INDEX.KEYLIST))
  [for key in (SORT INDEX.KEYLIST 'UALPHORDER)
    do (SETQ INDEX.VALUE (GETHASH KEY INDEX.ARRAY))
      (AND (CADR INDEX.VALUE)
        (NCONC INDEX.ITEMS (LIST KEY)))
      (AND (CADDR INDEX.VALUE)
        (NCONC INDEX.ITEMS (LIST (LIST KEY NIL "Select an IndexEntry subitem."
          (CONS 'SUBITEMS (LIST.OF.INDEXENTRIES KEY (CADDR INDEX.VALUE))
          (CDR INDEX.ITEMS]))
```

(LIST.OF.INDEXENTRIES

[LAMBDA (KEY OBJLIST) (* fsg "15-Jan-87 11:48")

(* * Returns a list of the IndexEntries sorted by Entry)

```
(LET ((ENTRY.LIST (CONS)
  OBJDATUM)
  [for OBJ in OBJLIST do (SETQ OBJDATUM (fetch OBJECTDATUM of OBJ))
    (NCONC ENTRY.LIST (LIST (LIST (CONCAT (fetch INDEX.ENTRY of OBJDATUM)
      ", "
      (ABBREVIATE.FONT (fetch INDEX.ENTRYFONT of OBJDATUM))
      ", "
      (fetch INDEX.NUMBER of OBJDATUM))
      (KWOTE (LIST KEY OBJDATUM))
  (SORT (INTERSECTION (CDR ENTRY.LIST)
    (CDR ENTRY.LIST))
    (FUNCTION (LAMBDA (A B)
      (UALPHORDER (CAADR (CADADR A))
        (CAADR (CADADR B))
```

(CREATE.INDEX.FILE

[LAMBDA (STREAM WINDOW) (* fsg "15-Dec-86 13:22")

(* * Writes the indices and their corresponding page numbers or strings to the index file. The indices are sorted alphabetically regardless of case.)

```
(LET* [(INDEX.ARRAY (WINDOWPROP WINDOW 'TSP.INDEX.ARRAY))
  (INDEX.LIST (INDEX.LIST.REFS WINDOW))
  (INDEX.FILE (GET.INDEX.FILE (WINDOWPROP WINDOW 'IMAGEOBJ.MENUW)))
  (INDEX.STREAM (AND INDEX.FILE (OPENTEXTSTREAM)
  (COND
    ((AND INDEX.LIST INDEX.FILE)
      (TEDIT.PROMPTPRINT STREAM (CONCAT "Putting indices in: " INDEX.FILE "...")
        T)
      (WRITE.INDEX.FILE INDEX.STREAM INDEX.LIST INDEX.ARRAY)
      (TEDIT.PROMPTPRINT STREAM "done")
      (TEDIT.PUT INDEX.STREAM INDEX.FILE)
      INDEX.FILE)
    (INDEX.LIST (TEDIT.PROMPTPRINT STREAM "Specify a file name for the indices first." T)
      NIL)
    (T (TEDIT.PROMPTPRINT STREAM "There are no indices in this document." T)
      NIL])
```

(VIEW.INDEX.FILE

[LAMBDA (STREAM WINDOW)

(* fsg "15-Dec-86 15:22")

(* * Writes out the index file via CREATE.INDEX.FILE and then opens another TEdit window where this new file is displayed.)

(LET ((INDEX.FILE (CREATE.INDEX.FILE STREAM WINDOW))
(INDEX.FILEW (WINDOWPROP WINDOW 'INDEX.WINDOW)))
(AND INDEX.FILE (COND

[(WINDOWP INDEX.FILEW)
(COND

((OPENWP INDEX.FILEW)
(TEDIT.GET (TEXTOBJ INDEX.FILEW)
INDEX.FILE))
((OPENW INDEX.FILEW)
(TEDIT INDEX.FILEW INDEX.FILEW]

(T [WINDOWPROP WINDOW 'INDEX.WINDOW (SETQ INDEX.FILEW (CREATEW NIL (CONCAT

"Viewing
index
file: "
INDEX.FILE
]

(TEDIT INDEX.FILE INDEX.FILEW])

(GET.INDEX.FILE

[LAMBDA (MENUW)

(* fsg "19-Aug-86 09:09")

(* * Return the user specified index file name.)

(LET* ((ITEM (FM.ITEMFROMID MENUW 'INDEX.FILE))
(FILENAME (FM.ITEMPROP ITEM 'LABEL)))

(COND
((NOT (STREQUAL FILENAME ""))
(MKATOM FILENAME])

(WRITE.INDEX.FILE

[LAMBDA (INDEX.STREAM INDEX.LIST INDEX.ARRAY)

(* fsg "28-Jan-87 13:31")

(* * Do the output to the index file. For each Index, the Key is printed followed by the list of page numbers in which this Index Key appears. Each IndexEntry is printed on a separate line and the page number depends on the IndexEntry Number option. After all indices/indexentries are printed, the array page number list is converted back to a string. This insures that the next DISPLAYFN call will reconvert the string back to a page number list.)

(DSPFONT (FONTCREATE ' (HELVETICA 14 BRR))
INDEX.STREAM)

(PRINTOUT INDEX.STREAM "Index" T T)
[for INDEX.ITEM in INDEX.LIST do (COND

[(LISTP INDEX.ITEM)
(LET ((PGS.AND.IMOBS (GETHASH (CAR INDEX.ITEM)
INDEX.ARRAY)))
(for INDEX.SUBITEM in (CDR (CADDR INDEX.ITEM))
do (for (INDEX.ENTRYARGS INDEX.FONT)
in (CDR (CADADR INDEX.SUBITEM))
do (DSPFONT (SETQ INDEX.FONT (FONTCREATE (CADR

INDEX.ENTRYARGS
)))

INDEX.STREAM)

(PRINTOUT INDEX.STREAM (MKSTRING (CAR INDEX.ENTRYARGS))

)
(WRITE.INDEX.PAGENUMBERS INDEX.STREAM PGS.AND.IMOBS

(CADDR INDEX.ENTRYARGS))

(DSPFONT INDEX.FONT INDEX.STREAM)

(PRINTOUT INDEX.STREAM T]

(T (DSPFONT GP.DefaultFont INDEX.STREAM)
(LET ((PGS.AND.IMOBS (GETHASH INDEX.ITEM INDEX.ARRAY)))
(COND

((CAR PGS.AND.IMOBS)
(PRINTOUT INDEX.STREAM (MKSTRING INDEX.ITEM))
(WRITE.INDEX.PAGENUMBERS INDEX.STREAM PGS.AND.IMOBS NIL)
(PRINTOUT INDEX.STREAM T))
(T NIL]

(for (INDEX.ITEM PAGES/IMOBS) in INDEX.LIST do (SETQ PAGES/IMOBS (GETHASH (COND

((LISTP INDEX.ITEM)

(CAR INDEX.ITEM))

(T INDEX.ITEM))

INDEX.ARRAY))

(RPLACA PAGES/IMOBS (COND

((STRINGP (CAR PAGES/IMOBS))

(CAR PAGES/IMOBS))

(T (CONCAT "[Pages "

(MKSTRING (CAR PAGES/IMOBS

))

"]"])

(WRITE.INDEX.PAGENUMBERS

[LAMBDA (STREAM PAGES.AND.IMOBS NUMBER.OPTION)

(* fsg "15-Jan-87 11:53")

(* * Here to write the actual page or pages nubers that this Index or IndexEntry appears in.
NUMBER.OPTION is the Number field of an IndexEntry.)

(DSPFONT GP.DefaultFont STREAM)

(LET ([PAGE.NBRS (COND

(NUMBER.OPTION (SELECTQ NUMBER.OPTION

(NO ""

(YES (CAR PAGES.AND.IMOBS))

(MKSTRING NUMBER.OPTION)))

(T (CAR PAGES.AND.IMOBS]

(PAGE#.STRING " ")

(COND

((LISTP PAGE.NBRS)

(for PAGE **in** PAGE.NBRS **do** (SETQ PAGE#.STRING (CONCAT PAGE#.STRING " " (MKSTRING PAGE)))

finally (PRINTOUT STREAM PAGE#.STRING)))

(T (PRINTOUT STREAM (CONCAT PAGE#.STRING PAGE.NBRS])

)

(DECLARE: EVAL@COMPILE

(RECORD INDEX.ENTRY.RECORD (INDEX.ENTRY INDEX.ENTRYFONT INDEX.NUMBER))

)

(PUTPROPS **INDEX COPYRIGHT** ("Leland Stanford Junior University" 1987))

FUNCTION INDEX

ADD.NEW.INDEX	3	INDEX.BUTTONEVENTINFN ...	2	INDEX.STRING	3	INSERT.KNOWN.INDEX	4
CHANGE.INDEX	2	INDEX.DISPLAYFN	1	INDEX.WHENDELETEDFN	3	LIST.OF.INDEXENTRIES	5
CHANGE.INDEXENTRY	3	INDEX.GETFN	2	INDEXOBJ	1	VIEW.INDEX.FILE	6
CREATE.INDEX.FILE	5	INDEX.IMAGEBOXFN	2	INDEXOBJP	1	WRITE.INDEX.FILE	6
GET.INDEX.FILE	6	INDEX.LIST.REFS	5	INSERT.INDEX	4	WRITE.INDEX.PAGENUMBERS .	7
GET.INDEXENTRY.NUMBER ...	4	INDEX.PUTFN	2	INSERT.INDEXENTRY	4		

RECORD INDEX

INDEX.ENTRY.RECORD	7
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