```
(RPAQQ LAFITE-SORTCOMS
       [(DECLARE%: EVAL@COMPILE DONTCOPY (FILES (SOURCE)
                                              LAFITE-DECLS))
        (FNS LAFITE.ASSURE.DATE.FIELDS LAFITE.PARSE.DATE.FIELD LAFITE.PARSE.DATE.FIELD.ONLY LAFITE.SORT.BY.DATE
             LAFITE.SORT.MESSAGES LAFITEMSG.DATE.ORDER \LAFITE.SORT.BY.DATE.INTERACTIVE
             \LAFITE.SORT.BY.DATE.REGION)
        [APPENDVARS (LAFITEEXTRAMENUITEMS ("Sort by Date" '\LAFITE.SORT.BY.DATE.INTERACTIVE "Sort all the
                                                 messages in this folder by their Date: fields."
                                                 (SUBITEMS ("Sort Entire Folder"
                                                                '\LAFITE.SORT.BY.DATE.INTERACTIVE "Sort all
                                                                 the messages in this folder by their Date:
                                                                 fields.")
                                                           ("Sort Selected Range" '\LAFITE.SORT.BY.DATE.REGION
                                                                "Sort only the messages between the first and
                                                                last selected messages."]
        (COMS                                                    ; Date hax
              (FNS GDATE1-6)
              (DECLARE%: EVAL@COMPILE DONTCOPY (CONSTANTS \4YearsDays)
                     (GLOBALVARS \TimeZoneComp \DayLightSavings])

(DECLARE%: EVAL@COMPILE DONTCOPY

(FILESLOAD (SOURCE)
      LAFITE-DECLS)
)

(DEFINEQ

(LAFITE.ASSURE.DATE.FIELDS
  [LAMBDA (FOLDER FIRST# LAST#)                                 ; Edited  5-May-89 15:46 by bvm

    ;; Assure that messages FIRST# thru LAST# have IDATE fields.  FIRST# & LAST# default.

    (for I from (OR FIRST# 1) to (OR LAST# (fetch (MAILFOLDER %#OFMESSAGES) of FOLDER))
        bind (STREAM _ (\LAFITE.OPEN.FOLDER FOLDER 'INPUT :ABORT))
             (MESSAGES _ (fetch (MAILFOLDER MESSAGEDESCRIPTORS) of FOLDER))
             (FAILURECNT _ 0)
             (MISSING _ 0)
             MSG ID PREV DATEFAILURE DATEFETCHED BABBLED
        do [if (fetch (LAFITEMSG DATEFETCHED?) of (SETQ MSG (NTHMESSAGE MESSAGES I)))
               then                                             ; Ok
                   (if (NOT (fetch (LAFITEMSG DATEKNOWN?) of MSG))
                       then (add FAILURECNT 1))
             else (if (NOT BABBLED)
                      then                                      ; Tell user what's taking so long
                          (LAB.PROMPTPRINT FOLDER "Collecting dates... ")
                          (SETQ BABBLED T))
                  (if (FIXP (SETQ ID (LAFITE.PARSE.HEADER STREAM \LAPARSE.DATEFIELD (fetch (LAFITEMSG START)
                                                                                          of MSG)
                                           (fetch (LAFITEMSG END) of MSG)
                                           T)))
                      then (replace (LAFITEMSG IDATE) of MSG with ID)
                           (replace (LAFITEMSG DATEKNOWN?) of MSG with T)
                           (replace (LAFITEMSG DATEFETCHED?) of MSG with T)
                           (replace (LAFITEMSG DATE) of MSG with NIL)
                                                                ; So it will be regenerated in canonical form
                           (OR DATEFETCHED (SETQ DATEFETCHED I))
                    else (replace (LAFITEMSG DATEKNOWN?) of MSG with NIL)
                         (if LAFITEDEBUGFLG
                             then (LAB.FORMAT FOLDER " ~:[Date missing for~;Could not parse date of~] msg ~D. " ID
                                        I))
                         (add FAILURECNT 1)
                         (if (NULL ID)
                             then (add MISSING 1))
                         (if [AND (> I 1)
                                  (fetch (LAFITEMSG DATEFETCHED?) of (SETQ PREV (NTHMESSAGE MESSAGES (SUB1 I]
                             then                               ; Guess that message i has date just after i-1
                                  (replace (LAFITEMSG IDATE) of MSG with (ADD1 (fetch (LAFITEMSG IDATE) of PREV)))
                                  (replace (LAFITEMSG DATEFETCHED?) of MSG with T)
                           else (SETQ DATEFAILURE I]
        finally (if (AND DATEFETCHED (< DATEFETCHED (fetch (MAILFOLDER TOCLASTMESSAGE#) of FOLDER)))
                    then                                        ; Assure that the toc will be rewritten at least this far back so that
                                                                ; we save the dates.
                         (replace (MAILFOLDER TOCLASTMESSAGE#) of FOLDER with DATEFETCHED))
             (COND
```

```
                    ([AND DATEFAILURE (NOT (for I from (ADD1 (OR FIRST# 1)) to (fetch (MAILFOLDER %#OFMESSAGES)
                                                                                of FOLDER)
                                            when (fetch (LAFITEMSG DATEFETCHED?) of (SETQ MSG (NTHMESSAGE MESSAGES
                                                                                                     I)))
                                            do                              ; Got a date later on
                                               (SETQ ID (fetch (LAFITEMSG IDATE) of MSG))
                                               (for J from DATEFAILURE to (OR FIRST# 1) by -1
                                                   do                        ; Store guess dates for first message(s)
                                                      (replace (LAFITEMSG IDATE) of (SETQ MSG (NTHMESSAGE MESSAGES J)
                                                                                         )
                                                          with (add ID -1))
                                                      (replace (LAFITEMSG DATEFETCHED?) of MSG with T))
                                            (RETURN T]
                      (LAB.PROMPTPRINT FOLDER "Could not parse dates of ANY messages in this file."))
                     ((> FAILURECNT 0)
                      (LAB.FORMAT FOLDER (if (< MISSING FAILURECNT)
                                             then " Note: Could not parse date field of ~D of these messages."
                                             else " Note: Missing date field for ~D of these messages.")
                                  FAILURECNT])
```

(**LAFITE.PARSE.DATE.FIELD**
```
  [LAMBDA (STREAM)                                                  ; Edited  5-May-89 12:52 by bvm
    (LET* ((DATESTR (LAFITE.READ.TO.EOL STREAM))
           (ID (IDATE DATESTR)))
          (if [AND ID (> ID (CONSTANT (IDATE "1-jan-70 1200"]
              then                                                  ; Plausible date.  Test is for those silly senders who didn't get the
                                                                    ; date set and have messages reading "31-dec-00 ..."
                   ID
              else (CONCAT (OR (SUBSTRING DATESTR 1 6 DATESTR)
                               DATESTR)
                           "?"])
```

(**LAFITE.PARSE.DATE.FIELD.ONLY**
```
  [LAMBDA (STREAM)
    (DECLARE (USEDFREE PARSERESULT))                               ; Edited 26-Apr-89 14:35 by bvm
    (SETQ PARSERESULT (LAFITE.PARSE.DATE.FIELD STREAM])
```

(**LAFITE.SORT.BY.DATE**
```
  [LAMBDA (FOLDER FIRST# LAST#)                                    ; Edited 26-Apr-89 15:32 by bvm
    (WITH.MONITOR (fetch (MAILFOLDER FOLDERLOCK) of FOLDER)
        (LAFITE.ASSURE.DATE.FIELDS FOLDER FIRST# LAST#)
        (LAFITE.SORT.MESSAGES FOLDER (FUNCTION LAFITEMSG.DATE.ORDER)
               FIRST# LAST#))])
```

(**LAFITE.SORT.MESSAGES**
```
  [LAMBDA (FOLDER COMPAREFN FIRST# LAST#)                          ; Edited  7-Oct-89 14:03 by bvm
    (WITH.MONITOR (fetch (MAILFOLDER FOLDERLOCK) of FOLDER)
        (OR FIRST# (SETQ FIRST# 1))
        (OR LAST# (SETQ LAST# (fetch (MAILFOLDER %#OFMESSAGES) of FOLDER)))
        (LAB.PROMPTPRINT FOLDER "Sorting... ")
        (LET* ((MESSAGES (fetch (MAILFOLDER MESSAGEDESCRIPTORS) of FOLDER))
               (SORTED (CL:STABLE-SORT (for I from FIRST# to LAST# collect (NTHMESSAGE MESSAGES I))
                           COMPAREFN)))
              (while (AND SORTED (EQ (fetch (LAFITEMSG %#) of (CAR SORTED))
                                     FIRST#))
                 do                                                ; Skip over the initial prefix of in-order messages
                    (add FIRST# 1)
                    (SETQ SORTED (CDR SORTED)))
              (if (NULL SORTED)
                  then (LAB.PROMPTPRINT FOLDER "already in order")
                  else (replace (MAILFOLDER FOLDEROUTOFORDER) of FOLDER with T)
                       (if (< FIRST# (fetch (MAILFOLDER FIRSTCHANGEDMESSAGE) of FOLDER))
                           then (replace (MAILFOLDER FIRSTCHANGEDMESSAGE) of FOLDER with FIRST#))
                       (UNINTERRUPTABLY
                           (for MSG in SORTED as I from FIRST# do (replace (LAFITEMSG %#) of MSG with I)
                                                                  (SETA MESSAGES I MSG)))
                       [LET ((FIRSTSEL (fetch (MAILFOLDER FIRSTSELECTEDMESSAGE) of FOLDER))
                             (LASTSEL (fetch (MAILFOLDER LASTSELECTEDMESSAGE) of FOLDER)))
                            (if (>= LASTSEL FIRSTSEL)
                                then (if (AND (>= FIRSTSEL FIRST#)
                                              (<= FIRSTSEL LAST#))
                                         then                      ; Start of selection was inside here, have to recompute its
                                                                   ; number
                                              (replace (MAILFOLDER FIRSTSELECTEDMESSAGE) of FOLDER
                                                 with (LAB.FIND.SELECTED.MSG FOLDER FIRST# LAST#)))
                                     (if (AND (>= LASTSEL FIRST#)
                                              (<= LASTSEL LAST#))
                                         then                      ; End of selection was inside here, have to recompute its number
                                              (replace (MAILFOLDER LASTSELECTEDMESSAGE) of FOLDER
                                                 with (LAB.REV.FIND.SELECTED.MSG FOLDER FIRST# LAST#]
                       (LAB.DISPLAYLINES FOLDER FIRST# LAST# NIL T)
                       (LAB.PROMPTPRINT FOLDER "done"))))])
```

(**LAFITEMSG.DATE.ORDER**

```
[LAMBDA (X Y)                                                    ; Edited 26-Apr-89 14:53 by bvm
```

   ;; True if msg X has older date than msg Y. Since date field is stored as an unboxed 32-bit integer, we open code "<" here to avoid boxing.

```
   (LET [(HIDIFF (- (LOGXOR (fetch (LAFITEMSG IDATEHI) of X)
                           32768)
                    (LOGXOR (fetch (LAFITEMSG IDATEHI) of Y)
                           32768]
```

         ;; HIDIFF is unsigned difference of high words

```
        (OR (< HIDIFF 0)
            (AND (EQ HIDIFF 0)
                 (< (fetch (LAFITEMSG IDATELO) of X)
                    (fetch (LAFITEMSG IDATELO) of Y])
```

(**LAFITE.SORT.BY.DATE.INTERACTIVE**

```
   [LAMBDA (FOLDER FIRST# LAST#)                                 ; Edited  3-May-89 18:38 by bvm
     (if (LAB.MOUSECONFIRM FOLDER "Click LEFT to confirm sorting ~D messages by date"
              (if LAST#
                  then (ADD1 (- LAST# FIRST#))
                  else (fetch (MAILFOLDER %#OFMESSAGES) of FOLDER)))
         then (\LAFITE.PROCESS '(,(FUNCTION LAFITE.SORT.BY.DATE)
                                ',FOLDER
                                ',FIRST#
                                ',LAST#)
                   "LafiteSort"])
```

(**LAFITE.SORT.BY.DATE.REGION**

```
   [LAMBDA (FOLDER)                                              ; Edited 28-Apr-89 16:23 by bvm
     (LET ((FIRST# (fetch (MAILFOLDER FIRSTSELECTEDMESSAGE) of FOLDER))
           (LAST# (fetch (MAILFOLDER LASTSELECTEDMESSAGE) of FOLDER)))
        (if (> LAST# FIRST#)
            then (\LAFITE.SORT.BY.DATE.INTERACTIVE FOLDER FIRST# LAST#)
          else (LAB.FORMAT FOLDER "There is ~:[no~;only one~] message selected." (EQ LAST# FIRST#)))
```

)

```
[APPENDTOVAR LAFITEEXTRAMENUITEMS ("Sort by Date" '\LAFITE.SORT.BY.DATE.INTERACTIVE "Sort all the messages in
                                  this folder by their Date: fields." (SUBITEMS ("Sort Entire Folder"
                                                                                '
                                                                                \LAFITE.SORT.BY.DATE.INTERACTIVE
                                                                                   "Sort all the messages
                                                                                    in this folder by their
                                                                                    Date: fields.")
                                                                               ("Sort Selected Range"
                                                                                '
                                                                                \LAFITE.SORT.BY.DATE.REGION
                                                                                   "Sort only the messages
                                                                                    between the first and last
                                                                                    selected messages."]
```

;; Date hax

(DEFINEQ

(**GDATE1-6**

```
   [LAMBDA (D)                                                   ; Edited 26-Apr-89 15:24 by bvm
```

   ;; Return a string containing the day and month given in internal date D.

   ;; This is an optimization by source code simplification of (SUBSTRING (GDATE IDT) 1 6)

```
   (PROG ((CHECKDLS \DayLightSavings)
          [DQ (IQUOTIENT (LRSH (LISP.TO.ALTO.DATE D)
                               1)
                         (CONSTANT (IQUOTIENT (TIMES 60 60)
                                              2]
           HR DAY4 YDAY WDAY YEAR4 TOTALDAYS DLS)                ; DQ is number of hours since day 0, getting us past the sign bit
                                                                 ; problem.
```

       ;; Now we can adjust to the current time zone. Since this might cause DQ to go negative, first add in 4 years worth of hours, making the base
       ;; date be Jan 1, 1897

```
         (SETQ HR (IREMAINDER (SETQ DQ (- (+ DQ (CONSTANT (ITIMES 24 \4YearsDays)))
                                          \TimeZoneComp))
                              24))
         (SETQ TOTALDAYS (IQUOTIENT DQ 24))
     DTLOOP
         (SETQ DAY4 (IREMAINDER TOTALDAYS \4YearsDays))          ; DAY4 = number of days since last leap year day 0
         [SETQ DAY4 (+ DAY4 (CDR (\DTSCAN DAY4 '((789 . 3)
                                                 (424 . 2)
                                                 (59 . 1)
                                                 (0 . 0]          ; pretend every year is a leap year, adding one for days after Feb
                                                                 ; 28
```

```
            (SETQ YEAR4 (IQUOTIENT TOTALDAYS \4YearsDays))          ; YEAR4 = number of years til that last leap year / 4
            (SETQ YDAY (IREMAINDER DAY4 366))                       ; YDAY is the ordinal day in the year (jan 1 = zero)
            (SETQ WDAY (IREMAINDER (+ TOTALDAYS 3)
                            7))
            [COND
                ((AND CHECKDLS (SETQ DLS (\ISDST? YDAY HR WDAY)))

                ;; This date is during daylight savings, so add 1 hour.  Third arg is day of the week, which we determine by taking days mod 7 plus
                ;; offset.  Monday = zero in this scheme.  Jan 1 1897 was actually a Friday (not Thursday=3), but we're cheating--1900 was not a leap
                ;; year

                (COND
                    ((> (SETQ HR (ADD1 HR))
                        23)

                    ;; overflowed into the next day.  This case is too hard (we might have overflowed the month, for example), so just go back and
                    ;; recompute

                    (SETQ TOTALDAYS (ADD1 TOTALDAYS))
                    (SETQ HR 0)
                    (SETQ CHECKDLS NIL)
                    (GO DTLOOP]
            (RETURN (LET* [[MONTH (\DTSCAN YDAY '((335 . "Dec")
                                                 (305 . "Nov")
                                                 (274 . "Oct")
                                                 (244 . "Sep")
                                                 (213 . "Aug")
                                                 (182 . "Jul")
                                                 (152 . "Jun")
                                                 (121 . "May")
                                                 (91 . "Apr")
                                                 (60 . "Mar")
                                                 (31 . "Feb")
                                                 (0 . "Jan"]
                            [DAY (ADD1 (- YDAY (CAR MONTH]
                            (RESULT (CONCAT "    " (CDR MONTH]
                            (\RPLRIGHT RESULT 2 DAY 1)
                            RESULT])
)

(DECLARE%: EVAL@COMPILE DONTCOPY

(DECLARE%: EVAL@COMPILE

(RPAQQ \4YearsDays 1461)

(CONSTANTS \4YearsDays)
)

(DECLARE%: DOEVAL@COMPILE DONTCOPY

(GLOBALVARS \TimeZoneComp \DayLightSavings)
)
)
```

FUNCTION INDEX

CONSTANT INDEX