```
(RPAQQ DPUPFTPCOMS
       [

;;; Implementation of the PUP FTP device

       (COMS (FNS \FTPINIT \FTPEVENTFN \FTP.OPENFILE \FTP.REOPENFILE \FTP.OPENFILE.FROM.PLIST \FTP.GETFILENAME
                  \FTP.RECOGNIZEFILE \FTP.DIRECTORYNAMEP \FTP.CLOSEFILE \FTP.REGISTER \FTP.UNREGISTER
                  \FTP.RENAMEFILE \FTP.DELETEFILE \FTP.GENERATEFILES \FTP.NEXTFILE \FTP.FILEINFOFN
                  \FTP.GETFILEINFO \FTP.GETFILEINFO.FROM.PROPS \FTP.FROM.LISP.ATTRIBUTE)
             (INITVARS (\FTPAVAILABLE)
                  (\FTP.IDLE.TIMEOUT 120000)
                  (*FTP-IGNORE-SERVER-FULL*)))
       (COMS ;; internal

             (FNS \FTP.OPEN.CONNECTION FTP.BREAKCONNECTION \FTP.SENDVERSION \FTP.WHENCLOSED \GETFTPCONNECTION
                  \RELEASE.FTPCONNECTION \FTP.ERRORHANDLER \FTP.FIX.BROKEN.INPUT \FTP.CLEANUP
                  \FTP.ASSURE.CLEANUP)
             (ADDVARS (\FTPCONNECTIONS))
             (FNS \FTP.HANDLE.NO \FTP.DIRECTORYNAMEONLY \FTP.EOL.FROM.PLIST \FTP.MAKEPLIST \FTP.PRINTPLIST
                  \FTP.PACKFILENAME \FTP.ADD.QUOTES \FTP.PACK.DIRECTORYNAMEP \FTP.UNPACKFILENAME
                  \FTP.ADD.USERINFO \FTP.FLUSH.TO.EOC \FTP.FLUSH.TO.MARK \FTPERROR))
       (COMS ;; for debugging

             (FNS FTPDEBUG FTPPRINTMARK FTPPRINTCODE FTPGETMARK FTPPUTMARK FTPPUTCODE FTPGETCODE)
             (INITVARS (FTPDEBUGLOG)
                  (FTPDEBUGFLG)))
       (DECLARE%: EVAL@COMPILE DONTCOPY (VARS FTPMARKTYPES)
             (CONSTANTS \FTP.VERSION)
             (CONSTANTS * FTPNOCODES)
             (MACROS MARK# .EOC. .FTPDEBUGLOG.)
             (PROP INFO MARK#)
             (RECORDS FTPCONNECTION FTPSTREAM FTPFILEGENSTATE)
             (GLOBALVARS FTPDEBUGFLG \FTPCONNECTIONS \FTPAVAILABLE \FTP.IDLE.TIMEOUT \BSPFDEV \FTPFDEV))
       (DECLARE%: DONTEVAL@LOAD DOCOPY (P (\FTPINIT])

;;; Implementation of the PUP FTP device

(DEFINEQ
```

(\FTPINIT

```
  [LAMBDA NIL                                                    ; Edited 17-Nov-87 14:43 by bvm:
     (COND
        ((type? FDEV \BSPFDEV)
         (SETQ \FTPFDEV (NCREATE 'FDEV \BSPFDEV))               ; Specialize the BSP device
         (with FDEV \FTPFDEV (SETQ DEVICENAME 'DPUPFTP)
               (SETQ OPENFILE (FUNCTION \FTP.OPENFILE))
               (SETQ REOPENFILE (FUNCTION \FTP.REOPENFILE))
               (SETQ CLOSEFILE (FUNCTION \FTP.CLOSEFILE))
               (SETQ DIRECTORYNAMEP (FUNCTION \FTP.DIRECTORYNAMEP))
               (SETQ GETFILENAME (FUNCTION \FTP.GETFILENAME))
               (SETQ GETFILEINFO (FUNCTION \FTP.GETFILEINFO))
               (SETQ RENAMEFILE (FUNCTION \FTP.RENAMEFILE))
               (SETQ DELETEFILE (FUNCTION \FTP.DELETEFILE))
               (SETQ GENERATEFILES (FUNCTION \FTP.GENERATEFILES))
               (SETQ EVENTFN (FUNCTION \FTPEVENTFN))
               (SETQ OPENP (FUNCTION \GENERIC.OPENP))
               (SETQ REGISTERFILE (FUNCTION \FTP.REGISTER))
               (SETQ UNREGISTERFILE (FUNCTION \FTP.UNREGISTER)))
         (SETQ \FTPAVAILABLE T])
```

(\FTPEVENTFN

```
  [LAMBDA (DEV EVENT)                                           (* bvm%: "28-Apr-85 14:32")
     (SELECTQ EVENT
        (BEFORELOGOUT (FTP.BREAKCONNECTION T))
        ((BEFORESYSOUT BEFOREMAKESYS BEFORESAVEVM)
         (FTP.BREAKCONNECTION T T))
        NIL)
     (\BSPEVENTFN DEV EVENT])
```

(**FTP.OPENFILE**
```
  [LAMBDA (FILENAME ACCESS RECOG OTHERINFO)                      ; Edited 16-Nov-87 17:17 by bvm
     (RESETLST
        (PROG (HOST DESIREDPLIST TYPE BYTESIZE EOLCONVENTION)
              (COND
                ((SELECTQ ACCESS
                     (INPUT (EQ RECOG 'NEW))
                     (OUTPUT (EQ RECOG 'OLD))
                     T)
                 (LISPERROR "FILE WON'T OPEN" FILENAME)))
              (OR (SETQ HOST (\FTP.UNPACKFILENAME FILENAME))
                  (RETURN))
              (SETQ DESIREDPLIST (CDR HOST))
              (SETQ HOST (CAR HOST))
              (SELECTQ ACCESS
                  (OUTPUT [for PAIR in OTHERINFO when (LISTP PAIR)
                             do (COND
                                  ((SELECTQ (CAR PAIR)
                                       ((TYPE FILETYPE)
                                        [SELECTQ (SETQ TYPE (CADR PAIR))
                                            (TEXT T)
                                            (NIL)
                                            (PROGN              ; All unrecognized types are BINARY
                                                  (SETQ TYPE 'BINARY]
                                        NIL)
                                       (BYTESIZE (SETQ BYTESIZE (OR (FIXP (CADR PAIR))
                                                                    (LISPERROR "ILLEGAL ARG" PAIR)))
                                              NIL)
                                       ((EOL EOLCONVENTION)
                                           (SETQ EOLCONVENTION (CADR PAIR))
                                           NIL)
                                       ((CREATIONDATE ICREATIONDATE)
                                          [push DESIREDPLIST (LIST 'CREATION-DATE
                                                                   (if (EQ (CAR PAIR)
                                                                           'ICREATIONDATE)
                                                                       then (GDATE (CADR PAIR)
                                                                                   (DATEFORMAT TIME.ZONE))
                                                                       else (CADR PAIR]
                                          NIL)
                                       (LENGTH [push DESIREDPLIST (LIST 'SIZE (OR (FIXP (CADR PAIR))
                                                                                  (LISPERROR "ILLEGAL ARG"
                                                                                             PAIR]
                                              NIL)
                                       ((SEQUENTIAL DON'TCACHE)
                                              NIL)
                                       T)
                                   (push DESIREDPLIST PAIR]
                             [push DESIREDPLIST (LIST 'TYPE (OR TYPE (SETQ TYPE DEFAULTFILETYPE]
                             (SELECTQ TYPE
                                 (TEXT [push DESIREDPLIST (LIST 'END-OF-LINE-CONVENTION (OR EOLCONVENTION
                                                                                           'CR]
                                 (BINARY (push DESIREDPLIST (LIST 'BYTE-SIZE (OR BYTESIZE 8))))
                                 NIL))
                  NIL)
              (RETURN (\FTP.OPENFILE.FROM.PLIST HOST DESIREDPLIST ACCESS)))))])
```

(**FTP.REOPENFILE**
```
  [LAMBDA (NAME ACCESS RECOG OTHERINFO FDEV STREAM)              ; Edited 17-Nov-87 14:43 by bvm:
```
   ;; This is for the crufty REVALIDATEFILELST that the Leaf device (where all our open files are registered) does after logout, etc. Simplest to just
   ;; pass the file back as though all is ok; we will actually reopen it in the broken connection error handler when somebody tries to read more from the
   ;; stream. Of course, if file was open for output, all is lost.
```
   (AND (EQ ACCESS 'INPUT)
        STREAM])
```

(**FTP.OPENFILE.FROM.PLIST**
```
  [LAMBDA (HOST DESIREDPLIST ACCESS)                             (* bvm%: "28-Apr-85 14:14")
     (PROG (CONNECTION INS OUTS REMOTEPLIST FULLNAME)
       NEWCONNECTION
           (OR (SETQ CONNECTION (\GETFTPCONNECTION HOST T))
               (RETURN))
           (SETQ INS (fetch FTPIN of CONNECTION))
           (SETQ OUTS (fetch FTPOUT of CONNECTION))
       RETRY
           (FTPPUTMARK OUTS (SELECTQ ACCESS
                                (INPUT (MARK# RETRIEVE))
                                (OUTPUT (MARK# NEW-STORE))
                                NIL))
           (\FTP.PRINTPLIST OUTS DESIREDPLIST)
           (.EOC. OUTS)
           (SELECTC (FTPGETMARK INS)
               ((MARK# NO)
                   (COND
                     [ (\FTP.HANDLE.NO CONNECTION DESIREDPLIST)
```

```
                        (COND
                            ((BSPOPENP INS 'INPUT)
                             (GO RETRY))
                            (T (GO NEWCONNECTION]
                       (T (\RELEASE.FTPCONNECTION CONNECTION)
                          (RETURN))))
                ((MARK# HERE-IS-PLIST)
                    (SETQ REMOTEPLIST (READPLIST INS))
                    [SETQ FULLNAME (\FTP.PACKFILENAME HOST REMOTEPLIST NIL (CADR (ASSOC 'DEVICE DESIREDPLIST]
                    (OR (EQ (FTPGETMARK INS)
                            (MARK# EOC))
                        (RETURN (\FTPERROR CONNECTION))))
                ((MARK# BROKEN)
                    (GO NEWCONNECTION))
                (RETURN (\FTPERROR CONNECTION)))
            (SELECTQ ACCESS
                (INPUT (FTPPUTMARK OUTS (MARK# YES))
                       (FTPPUTCODE OUTS 0)
                       (.EOC. OUTS)
                       (SELECTC (FTPGETMARK INS)
                           ((MARK# NO)
                               [COND
                                   ((\FTP.HANDLE.NO CONNECTION DESIREDPLIST NIL NIL T)
                                    (CLOSEBSPSTREAM INS 2000)        ; Can't recover from in the middle like this, so just flush and start
                                                                    ; over
                                    (GO NEWCONNECTION))
                                   (T (\RELEASE.FTPCONNECTION CONNECTION)
                                      (RETURN (LISPERROR "FILE WON'T OPEN" FULLNAME)])
                           ((MARK# HERE-IS-FILE)
                               (replace FULLFILENAME of INS with FULLNAME)
                               (replace FTPFILEPROPS of INS with REMOTEPLIST)
                               (replace ACCESS of INS with 'INPUT)
                               (replace EOLCONVENTION of INS with (\FTP.EOL.FROM.PLIST REMOTEPLIST))
                               (\BSP.DECLARE.FILEPTR INS 0)        ; For GETFILEPTR
                               (replace DEVICE of INS with \FTPFDEV)
                               (RETURN INS))
                           ((MARK# BROKEN)
                               (GO NEWCONNECTION))
                           (RETURN (\FTPERROR CONNECTION))))
                (OUTPUT (COND
                            ((BSPOPENP OUTS 'OUTPUT)
                             (FTPPUTMARK OUTS (MARK# HERE-IS-FILE))
                             (replace FULLFILENAME of OUTS with FULLNAME)
                             (replace FTPFILEPROPS of OUTS with REMOTEPLIST)
                             (\BSP.DECLARE.FILEPTR OUTS 0)
                             (replace EOLCONVENTION of OUTS with (\FTP.EOL.FROM.PLIST DESIREDPLIST))
                             (replace DEVICE of OUTS with \FTPFDEV)
                             (RETURN OUTS))
                            (T (GO NEWCONNECTION))))
                NIL])
```

(\FTP.GETFILENAME

```
  [LAMBDA (NAME RECOG DEV)                                                   ; Edited 16-Nov-87 18:52 by bvm
    (SELECTQ RECOG
        ((OLD OLDEST)
            (\FTP.RECOGNIZEFILE NAME DEV NIL RECOG))
        ((OLD/NEW NEW)
            (OR (\FTP.RECOGNIZEFILE NAME DEV NIL RECOG)
                (PACKFILENAME 'BODY NAME 'VERSION 1)))
        (SHOULDNT])
```

(\FTP.RECOGNIZEFILE

```
  [LAMBDA (NAME DEV OPTION RECOG DESIREDPROPS)                               ; Edited 19-Aug-88 12:04 by bvm
    (RESETLST
        (PROG (CONNECTION HOST INS OUTS REMOTEPLIST DESIREDPLIST BESTVERSION V BESTPLIST RESULT CODE
                     DEVICEWANTED)
              (OR (SETQ HOST (\FTP.UNPACKFILENAME NAME))
                  (RETURN))
              (SETQ DESIREDPLIST (CDR HOST))
              (SETQ HOST (CAR HOST))
              [if (EQ OPTION 'DIRECTORYNAMEP)
                  then                                                        ; Give random fake name
                       (RPLACA (CDR (ASSOC 'NAME-BODY DESIREDPLIST))
                               "QXZYQJ")
                else (push DESIREDPLIST '(DESIRED-PROPERTY VERSION))
                                                                              ; Will need VERSION attribute to discriminate versions
                     [if (NULL (ASSOC 'VERSION DESIREDPLIST))
                         then                                                 ; Try to restrict enumeration to a single version for speed
                              (if (SETQ V (SELECTQ (GETHOSTINFO HOST 'OSTYPE)
                                              (VMS (if (EQ RECOG 'OLDEST)
                                                       then "-0"
                                                       else "0"))
                                              ((TENEX TOPS20)
                                                  (if (EQ RECOG 'OLDEST)
                                                      then "-2"
```

```
                                                                    else "0"))
                                                          ((NIL IFS D)
                                                                (if (EQ RECOG 'OLDEST)
                                                                    then "L"
                                                                    else "H"))
                                                          NIL))
                                         then (push DESIREDPLIST (LIST 'VERSION V]
                            (if (NEQ OPTION 'PROPS)
                                then (push DESIREDPLIST '(DESIRED-PROPERTY NAME-BODY]
                  [if (NEQ OPTION 'PROPS)
                      then                                                             ; PROPS doesn't care about the actual name
                            (push DESIREDPLIST '(DESIRED-PROPERTY DIRECTORY))
                            (if (SETQ DEVICEWANTED (CADR (ASSOC 'DEVICE DESIREDPLIST)))
                                then (push DESIREDPLIST '(DESIRED-PROPERTY DEVICE]
                  [for PROP in DESIREDPROPS do (push DESIREDPLIST '(DESIRED-PROPERTY ,PROP]
            NEWCONNECTION
                  (OR (SETQ CONNECTION (\GETFTPCONNECTION HOST T T))
                      (RETURN))
                  (SETQ INS (fetch FTPIN of CONNECTION))
                  (SETQ OUTS (fetch FTPOUT of CONNECTION))
            RETRY
                  (FTPPUTMARK OUTS (MARK# ENUMERATE))
                  (\FTP.PRINTPLIST OUTS DESIREDPLIST)
                  (.EOC. OUTS)
            LP    (SELECTC (FTPGETMARK INS)
                      ((MARK# NO)
                          [SELECTC (SETQ CODE (FTPGETCODE INS T))
                              (\NO.ILLEGAL.DIRECTORY
                                  (\FTP.FLUSH.TO.EOC INS (.FTPDEBUGLOG.)))
                              (\NO.FILE.NOT.FOUND
                                  (\FTP.FLUSH.TO.EOC INS (.FTPDEBUGLOG.))
                                  [COND
                                      ((EQ OPTION 'DIRECTORYNAMEP)   ; Directory exists
                                        (SETQ RESULT (\FTP.PACK.DIRECTORYNAMEP CONNECTION DESIREDPLIST])
                              (COND
                                  ((\FTP.HANDLE.NO CONNECTION DESIREDPLIST NIL CODE NIL T)
                                    (COND
                                        ((BSPOPENP INS 'INPUT)
                                          (GO RETRY))
                                        (T (GO NEWCONNECTION]))
                      ((MARK# HERE-IS-PLIST)                                       ; Have to remember the plist corresponding to the best version.
                          (SETQ REMOTEPLIST (READPLIST INS))
                          (if [OR [NULL (SETQ V (CADR (ASSOC 'VERSION REMOTEPLIST]
                                  (PROGN (SETQ V (MKATOM V))
                                          (OR (NULL BESTVERSION)
                                              (SELECTQ RECOG
                                                  (OLDEST (< V BESTVERSION))
                                                  (> V BESTVERSION]
                              then (SETQ BESTVERSION V)
                                    (SETQ BESTPLIST REMOTEPLIST))
                          (GO LP))
                      ((MARK# BROKEN)
                          (GO NEWCONNECTION))
                      ((MARK# EOC)
                          [SETQ RESULT (SELECTQ OPTION
                                          (PROPS BESTPLIST)
                                          (DIRECTORYNAMEP
                                              (\FTP.PACK.DIRECTORYNAMEP CONNECTION BESTPLIST))
                                          (PROGN (if (AND (EQ RECOG 'NEW)
                                                          BESTVERSION)
                                                    then              ; For RECOG NEW bump the version
                                                        (RPLACA (CDR (ASSOC 'VERSION BESTPLIST))
                                                                (+ BESTVERSION 1)))
                                              (\FTP.PACKFILENAME HOST BESTPLIST NIL DEVICEWANTED])
                          (\FTPERROR CONNECTION))
                  (\RELEASE.FTPCONNECTION CONNECTION)
                  (RETURN RESULT)))])
```

(**FTP.DIRECTORYNAMEP**
```
  [LAMBDA (HOST/DIR DEV)                                                      (* bvm%: "27-SEP-83 17:59")
    (\FTP.RECOGNIZEFILE HOST/DIR DEV 'DIRECTORYNAMEP])
```

(**FTP.CLOSEFILE**
```
  [LAMBDA (STREAM)                                                            ; Edited 30-Nov-87 16:35 by bvm:
    (PROG ((ACCESS (fetch ACCESS of STREAM))
            [CONN (find C in \FTPCONNECTIONS suchthat (OR (EQ (fetch FTPIN of C)
                                                              STREAM)
                                                          (EQ (fetch FTPOUT of C)
                                                              STREAM]
            (FILENAME (fetch FULLFILENAME of STREAM))
            INS SUCCESS)
          (replace FTPFILEPROPS of STREAM with NIL)
          (SELECTQ ACCESS
              (INPUT [COND
                        ((NOT (BSPOPENP STREAM ACCESS))                       ; connection went away
```

```
                                    NIL)
                                   ([OR (\EOFP STREAM)
                                        (PROGN (\BSP.FLUSHINPUT STREAM)
                                               (AND (BSPOPENP STREAM ACCESS)
                                                    (\EOFP STREAM]
                            ;; Hack.  We are at the end of the file, or the remainder of the file has been sent, so we can terminate the RETRIEVE
                            ;; cleanly
                                    (SETQ SUCCESS (SELECTC (FTPGETMARK STREAM)
                                                       ((MARK# YES)             ; File sent ok
                                                           (FTPGETCODE STREAM)
                                                           (\FTP.FLUSH.TO.EOC STREAM (.FTPDEBUGLOG.)))
                                                       ((MARK# NO)
                                                           (FTPGETCODE STREAM T)
                                                           (PROG1 (\FTP.FLUSH.TO.EOC STREAM (\GETSTREAM PROMPTWINDOW
                                                                                                      'OUTPUT))
                                                               (ERROR "CLOSEF: Remote file not successfully retrieved")
                                                               ))
                                                       NIL])
                       (OUTPUT (OR (SELECTC (COND
                                               ((SETQ INS (BSPINPUTSTREAM STREAM))
                                                (FTPPUTMARK STREAM (MARK# YES))
                                                (FTPPUTCODE STREAM 0)
                                                (.EOC. STREAM)
                                                (FTPGETMARK INS)))
                                         ((MARK# YES)
                                             (FTPGETCODE INS)
                                             (SETQ SUCCESS (\FTP.FLUSH.TO.EOC INS (.FTPDEBUGLOG.))))
                                         ((MARK# NO)
                                             (SELECTC (PROG1 (FTPGETCODE INS T)
                                                         (CL:FORMAT PROMPTWINDOW "~&~A: " (fetch FTPHOST of CONN))
                                                         [SETQ SUCCESS (\FTP.FLUSH.TO.EOC INS (\GETSTREAM PROMPTWINDOW
                                                                                                         'OUTPUT])
                                                     (\NO.STORAGE.FULL
                                                         (LISPERROR "FILE SYSTEM RESOURCES EXCEEDED" FILENAME))
                                                     NIL))
                                         NIL)
                                   (ERROR "CLOSEF: Remote file not successfully stored" FILENAME)))
                       NIL)
              (COND
                 (SUCCESS                                              ; Stream still in good protocol state
                     (replace DEVICE of STREAM with \BSPFDEV)          ; Make it back into a plain BSP stream
                     (\RELEASE.FTPCONNECTION CONN))
                 (CONN (CLOSEBSPSTREAM (fetch FTPIN of CONN)
                             1000)))
              (RETURN FILENAME)])
```

\FTP.REGISTER
```
  [LAMBDA (DEVICE STREAM)                                          (* PAVEL "14-Oct-86 19:09")
     (\ADD-OPEN-STREAM (\GETDEVICEFROMNAME (fetch (STREAM FULLFILENAME) of STREAM))
           STREAM])
```

\FTP.UNREGISTER
```
  [LAMBDA (DEVICE STREAM)                                          (* hdj " 1-Oct-86 18:23")
     (\GENERIC-UNREGISTER-STREAM (if (FMEMB STREAM (\DEVICE-OPEN-STREAMS DEVICE))
                                     then DEVICE
                                     else (\GETDEVICEFROMNAME (fetch (STREAM FULLNAME) of STREAM)))
           STREAM])
```

\FTP.RENAMEFILE
```
  [LAMBDA (OLD-DEVICE OLDFILE NEW-DEVICE NEWFILE)                   ; Edited 16-Nov-87 19:02 by bvm
     (COND
        ((NEQ OLD-DEVICE NEW-DEVICE)
         (\GENERIC.RENAMEFILE OLD-DEVICE OLDFILE NEW-DEVICE NEWFILE))
        (T (RESETLST
              [PROG ((HOST (\FTP.UNPACKFILENAME OLDFILE))
                     CONNECTION HOST OLDNAME INS OUTS OLDPLIST NEWPLIST CODE)
                    (if NIL
                        then                                        ; This is junk
                            (OR HOST (FDEVOP 'OPENP OLD-DEVICE (FULLNAME OLDFILE)
                                            NIL OLD-DEVICE)
                                 (RETURN)))
                    (SETQ OLDPLIST (CDR HOST))
                    (SETQ HOST (CAR HOST))
                    (OR (SETQ NEWPLIST (\FTP.UNPACKFILENAME NEWFILE T))
                        (RETURN))
                    (if (NOT (STRING-EQUAL (CAR NEWPLIST)
                                    HOST))
                        then                                        ; Different hosts--can't do it.  This happens only if both hosts are
                                                                    ; ftp-only hosts, in which case they got mapped to the same
                                                                    ; device
                            (RETURN (\GENERIC.RENAMEFILE OLD-DEVICE OLDFILE NEW-DEVICE NEWFILE))
                        else (SETQ NEWPLIST (CDR NEWPLIST)))
                    (CLEAR.LEAF.CACHE HOST)                         ; In case Leaf has this file open for input
```

```
                    NEWCONNECTION
                        (OR (SETQ CONNECTION (\GETFTPCONNECTION HOST T T))
                            (RETURN))
                        (SETQ INS (fetch FTPIN of CONNECTION))
                        (SETQ OUTS (fetch FTPOUT of CONNECTION))
                    RETRY
                        (FTPPUTMARK OUTS (MARK# RENAME))
                        (\FTP.PRINTPLIST OUTS OLDPLIST)
                        (\FTP.PRINTPLIST OUTS NEWPLIST)
                        (.EOC. OUTS)
                        (RETURN (if (PROG1 (SELECTC (FTPGETMARK INS)
                                               ((MARK# NO)
                                                   [SELECTC (SETQ CODE (FTPGETCODE INS T))
                                                       (\NO.UNIMPLEMENTED    ;; Concession to stupid DEI

                                                           (\FTP.FLUSH.TO.EOC INS (.FTPDEBUGLOG.))
                                                           (RETURN (\GENERIC.RENAMEFILE OLD-DEVICE OLDFILE
                                                                         NEW-DEVICE NEWFILE)))
                                                       (COND
                                                           ((\FTP.HANDLE.NO CONNECTION OLDPLIST NIL CODE NIL NIL
                                                                   NEWPLIST)
                                                             (COND
                                                                 ((BSPOPENP INS 'INPUT)
                                                                  (GO RETRY))
                                                                 (T (GO NEWCONNECTION]
                                               ((MARK# YES)
                                                   (FTPGETCODE INS)
                                                   (AND (\FTP.FLUSH.TO.EOC INS (.FTPDEBUGLOG.))
                                                        NEWFILE))
                                               ((MARK# BROKEN)
                                                   (GO NEWCONNECTION))
                                               (\FTPERROR CONNECTION))
                                           (\RELEASE.FTPCONNECTION CONNECTION))
                                       then NEWFILE
                                       else (LISPERROR "FILE WON'T OPEN" NEWFILE])])
```

FTP.DELETEFILE

```
  [LAMBDA (FILENAME)                                                       ; Edited 30-Nov-87 16:16 by bvm:
    (RESETLST
        [PROG (CONNECTION HOST REMOTENAME INS OUTS REMOTEPLIST DESIREDPLIST RESULT)
             (OR (SETQ HOST (\FTP.UNPACKFILENAME FILENAME))
                 (if NIL
                     then                                                  ; This is junk
                         (LET* ((NAME (FULLNAME FILENAME))
                                (DEVICE (\GETDEVICEFROMNAME NAME)))
                              (FDEVOP 'OPENP DEVICE NAME NIL DEVICE)))
                 (RETURN))
             (SETQ DESIREDPLIST (CDR HOST))
             (SETQ HOST (CAR HOST))
             [COND
                 ((AND (NULL (ASSOC 'VERSION DESIREDPLIST))
                       (EQ (GETHOSTINFO HOST 'OSTYPE)
                           'VMS))                                          ; Ugh bletch, VMS defaults version to newest, have to explicitly
                                                                          ; ask for oldest
                      (push DESIREDPLIST (LIST 'VERSION "-0"]
             (for PROP in '(DIRECTORY NAME-BODY VERSION) do (push DESIREDPLIST (LIST 'DESIRED-PROPERTY PROP)))
             (CLEAR.LEAF.CACHE HOST)                                       ; In case Leaf has this file open for input
        NEWCONNECTION
             (OR (SETQ CONNECTION (\GETFTPCONNECTION HOST T T))
                 (RETURN))
             (SETQ INS (fetch FTPIN of CONNECTION))
             (SETQ OUTS (fetch FTPOUT of CONNECTION))
        RETRY
             (FTPPUTMARK OUTS (MARK# DELETE))
             (\FTP.PRINTPLIST OUTS DESIREDPLIST)
             (.EOC. OUTS)
             (SELECTC (FTPGETMARK INS)
                 ((MARK# NO)
                     (COND
                         [(\FTP.HANDLE.NO CONNECTION DESIREDPLIST NIL NIL NIL T)
                          (COND
                              ((BSPOPENP INS 'INPUT)
                               (GO RETRY))
                              (T (GO NEWCONNECTION]
                         (T                                               ; Note that Lisp's DELFILE prefers to return NIL to reporting
                                                                         ; errors
                             (\RELEASE.FTPCONNECTION CONNECTION)
                             (RETURN NIL))))
                 ((MARK# HERE-IS-PLIST)
                     NIL)
                 ((MARK# BROKEN)
                     (GO NEWCONNECTION))
                 (RETURN (\FTPERROR CONNECTION)))
        NEXTPLIST
             (SETQ REMOTEPLIST (READPLIST INS))
             (OR (EQ (FTPGETMARK INS)
```

```
                        (MARK# EOC))
                    (\FTPERROR CONNECTION))
                (FTPPUTMARK OUTS (MARK# YES))
                (FTPPUTCODE OUTS 0)
                (.EOC. OUTS)
                (SELECTC (FTPGETMARK INS)
                    ((MARK# NO)
                        (COND
                            ((\FTP.HANDLE.NO CONNECTION DESIREDPLIST NIL NIL T T)
                             (CLOSEBSPSTREAM INS 2000)
                             (GO NEWCONNECTION))))
                    ((MARK# YES)
                        (FTPGETCODE INS)
                        (\FTP.FLUSH.TO.MARK INS)
                        [push RESULT (\FTP.PACKFILENAME HOST REMOTEPLIST NIL (CADR (ASSOC 'DEVICE DESIREDPLIST])
                    (RETURN (\FTPERROR CONNECTION)))
```

;; Got Yes/No on that file, see if there will be more. Usually there is just one file, but this code is prepared to do DELETE *.*....

```
                (SELECTC (FTPGETMARK INS)
                    ((MARK# HERE-IS-PLIST)
                        (GO NEXTPLIST))
                    ((MARK# EOC)
                        (\RELEASE.FTPCONNECTION CONNECTION)
                        [RETURN (COND
                                    ((CDR RESULT)
                                     (REVERSE RESULT))
                                    (T (CAR RESULT]))
                    (RETURN (\FTPERROR CONNECTION]))
```

(\\FTP.GENERATEFILES

```
  [LAMBDA (DEVICE PATTERN DESIREDPROPS OPTIONS)                          ; Edited 19-Aug-88 11:54 by bvm
    (PROG [[RESULT (RESETLST
                    [PROG (CONNECTION HOST REMOTENAME INS OUTS DESIREDPLIST CODE VERSION EXTENSION DEVICE
                            WANTDEVICE NAME DIRECTORY NAMEBODY OSTYPE INFO FILTERNEEDED)
                        (for TAIL on (UNPACKFILENAME.STRING PATTERN) by (CDDR TAIL)
                           do (SELECTQ (CAR TAIL)
                                  (HOST [SETQ HOST (\CANONICAL.HOSTNAME (MKATOM (CADR TAIL))
                                  (DIRECTORY (SETQ DIRECTORY (CADR TAIL)))
                                  (NAME (SETQ NAME (CADR TAIL)))
                                  (EXTENSION (SETQ EXTENSION (OR (CADR TAIL)
                                                                "")))
                                  (VERSION [SETQ VERSION (AND (IGREATERP (NCHARS (CADR TAIL))
                                                                        0)
                                                              (MKATOM (CADR TAIL])
                                  (DEVICE (SETQ WANTDEVICE (SETQ DEVICE (CADR TAIL))))
                                  (RETURN)))
                        (SETQ OSTYPE (GETHOSTINFO HOST 'OSTYPE))
                        (SELECTQ OSTYPE
                            (TENEX [COND
                                       ((AND (STRPOS '* NAME)
                                             (IGREATERP (NCHARS NAME)
                                                        1))
                                        (SETQ FILTERNEEDED (SETQ NAME '*]
                                   [COND
                                       (EXTENSION (SELECTQ (NCHARS EXTENSION)
                                                      (0      ; Maxc enumerates 'name.*' even when given just 'name.'
                                                        (SETQ FILTERNEEDED T))
                                                      (1      ; Extension * no problem
                                                        )
                                                      (COND
                                                          ((STRPOS '* EXTENSION)
                                                           (SETQ FILTERNEEDED (SETQ EXTENSION '*]
                                   [OR VERSION (COND
                                                   ((EQ OSTYPE 'TENEX)
                                                    (SETQ VERSION 0])
                            (TOPS20                           ; Can handle all *'s
                                   (OR VERSION (SETQ VERSION 0))
                                   (OR WANTDEVICE (SETQ WANTDEVICE T)))
                            (VMS                              ; Can handle all *'s
                                   )
                            ((NIL IFS UNIX)
                                   (COND
                                       (EXTENSION (SELECTQ (NCHARS EXTENSION)
                                                      (1 [COND
                                                             ((EQ (CHCON1 EXTENSION)
                                                                  (CHARCODE *))
                                                              ; If enumerating FOO.* need to ask for FOO* or else we will miss
                                                              ; extensionless FOO
                                                              (SETQ EXTENSION NIL)
                                                              (COND
                                                                  ((NEQ (NTHCHARCODE NAME -1)
                                                                        (CHARCODE *))
                                                                   (SETQ FILTERNEEDED (SETQ NAME
                                                                                          (CONCAT NAME
                                                                                                  '*])
                                                      (0
```

```
                                            ;; Explicit null extension.  IFS enumerates FOO.  okay, but FOO*. would also
                                            ;; enumerate files with non-null extensions
                                                  (SETQ EXTENSION NIL)
                                                  (SETQ FILTERNEEDED (STRPOS '* NAME)))
                                        NIL)))
                        [COND
                          [(EQ OSTYPE 'UNIX)           ; Coerce directory name to lowercase, get rid of trailing /
                           [COND
                              ((EQ (NTHCHARCODE DIRECTORY -1)
                                   (CHARCODE /))
                               (SETQ DIRECTORY (SUBSTRING DIRECTORY 1 -2]
                           [COND
                              ((NEQ (NTHCHARCODE DIRECTORY 1)
                                    (CHARCODE /))
                               (SETQ DIRECTORY (CONCAT '/ DIRECTORY]
                           (COND
                              ((U-CASEP DIRECTORY)
                               (SETQ DIRECTORY (L-CASE DIRECTORY]
                          (T (OR VERSION (SETQ VERSION 'H))
                        NIL)
                        (SETQ DESIREDPLIST (for PROP in (NCONC (for PROP in DESIREDPROPS
                                                                  collect (\FTP.FROM.LISP.ATTRIBUTE PROP))
                                                            '(DIRECTORY NAME-BODY VERSION))
                                                  collect (LIST 'DESIRED-PROPERTY PROP)))
                        [COND
                          ([AND VERSION (OR (NEQ VERSION '*)
                                            (EQ OSTYPE 'VMS]
                           (push DESIREDPLIST (LIST 'VERSION VERSION]
                        [SETQ NAMEBODY (COND
                                          ((NULL EXTENSION)
                                           NAME)
                                          (T (CONCAT NAME "." EXTENSION]
                        [COND
                          ((EQ OSTYPE 'UNIX)
                           [COND
                              ((AND NIL (U-CASEP NAMEBODY))

                               ;; Would like to help out by coercing name to lowercase, but the leaf server really does write
                               ;; uppercase filenames!

                               (SETQ NAMEBODY (L-CASE NAMEBODY]
                           (COND
                              ((NEQ (NTHCHARCODE NAMEBODY -1)
                                    (CHARCODE *))            ; Unix FTP server does not understand versions, so make sure
                                                             ; that whatever pattern we give ends in *
                               (SETQ FILTERNEEDED (SETQ NAMEBODY (CONCAT NAMEBODY '*]
                        (push DESIREDPLIST (LIST 'NAME-BODY NAMEBODY))
                        [COND
                          (DIRECTORY (push DESIREDPLIST (LIST 'DIRECTORY DIRECTORY]
                        [COND
                          (WANTDEVICE (push DESIREDPLIST (LIST 'DESIRED-PROPERTY 'DEVICE))
                                      (COND
                                        (DEVICE (push DESIREDPLIST (LIST 'DEVICE DEVICE]
                        (push DESIREDPLIST [LIST 'USER-NAME (CAR (SETQ INFO (\INTERNAL/GETPASSWORD HOST]
                            (LIST 'USER-PASSWORD (CDR INFO)))
                   NEWCONNECTION
                        (OR (SETQ CONNECTION (\GETFTPCONNECTION HOST T T))
                            (GO NOFILES))
                        (SETQ INS (fetch FTPIN of CONNECTION))
                        (SETQ OUTS (fetch FTPOUT of CONNECTION))
                   RETRY
                        (FTPPUTMARK OUTS (MARK# ENUMERATE))
                        (\FTP.PRINTPLIST OUTS DESIREDPLIST)
                        (.EOC. OUTS)
                        (SELECTC (FTPGETMARK INS)
                            ((MARK# NO)
                                 (COND
                                    [(\FTP.HANDLE.NO CONNECTION DESIREDPLIST NIL CODE NIL T)
                                     (COND
                                        ((BSPOPENP INS 'INPUT)
                                         (GO RETRY))
                                        (T (GO NEWCONNECTION]
                                    (T (\RELEASE.FTPCONNECTION CONNECTION))))
                            ((MARK# HERE-IS-PLIST)
                                 (replace FTPBUSY of CONNECTION with (SETUPTIMER \FTP.IDLE.TIMEOUT))
                                                             ; This guy gets a timer because the generator could be aborted
                                                             ; out of our control.  Blech
                                 [RETURN (create FILEGENOBJ
                                                 NEXTFILEFN _ (FUNCTION \FTP.NEXTFILE)
                                                 FILEINFOFN _ (FUNCTION \FTP.FILEINFOFN)
                                                 GENFILESTATE _
                                                  (create FTPFILEGENSTATE
                                                          FTPGENCONNECTION _ CONNECTION
                                                          FTPDEVICEWANTED _ WANTDEVICE
                                                          FTPGENPLIST _ NIL
                                                          FTPNAMEFILTER _ (AND FILTERNEEDED (
                                                                          DIRECTORY.MATCH.SETUP
```

```
                                                                                                      PATTERN])
                                      ((MARK# BROKEN)
                                          (GO NEWCONNECTION))
                                      (\FTPERROR CONNECTION))
                            NOFILES
                                  (RETURN (create FILEGENOBJ
                                                  NEXTFILEFN _ (FUNCTION NILL])]
            [COND
                ((AND RESULT (fetch GENFILESTATE of RESULT))                    ; Have a generator, so need to assure generator will terminate
                  (COND
                    [(EQMEMB 'RESETLST OPTIONS)
                      (RESETSAVE NIL (LIST [FUNCTION (LAMBDA (CONNECTION)
                                                        (AND RESETSTATE (CLOSEBSPSTREAM (fetch FTPIN of CONNECTION)
                                                                                        0]
                                          (fetch FTPGENCONNECTION of (fetch GENFILESTATE of RESULT]
                    (T (\FTP.ASSURE.CLEANUP]
            (RETURN RESULT]))
```

(\FTP.NEXTFILE
```
  [LAMBDA (GENSTATE NAMEONLY)                                           (* bvm%: "13-Jul-84 16:44")
    (DECLARE (SPECVARS FTPCONNECTION))                                  ; Seen by \FTP.CLEANUP
    (PROG ((FTPCONNECTION (fetch FTPGENCONNECTION of GENSTATE))
           (FILTER (fetch FTPNAMEFILTER of GENSTATE))
          INS NAMEBODY NAME EXT N PLIST)
        (COND
            ((NULL FTPCONNECTION)
             (RETURN (ERROR "End of file Enumerator" GENSTATE)))
            ((NOT (SETQ INS (fetch FTPIN of FTPCONNECTION)))
             (GO BROKEN)))
     LP (SETUPTIMER \FTP.IDLE.TIMEOUT (fetch FTPBUSY of FTPCONNECTION))
        [COND
            ((\EOFP INS)

             ;; NEW-ENUMERATE sends plists one after another with no intervening HERE-IS-PLIST;  check here for oldstyle, or for end of
             ;; command

             (SELECTC (FTPGETMARK INS)
                 ((MARK# EOC)
                     (\RELEASE.FTPCONNECTION FTPCONNECTION)
                     (replace FTPGENCONNECTION of GENSTATE with NIL)
                     (RETURN NIL))
                 ((MARK# HERE-IS-PLIST)                                 ; Old style


                     )
                 ((MARK# BROKEN)
                     (GO BROKEN))
                 (RETURN (\FTPERROR FTPCONNECTION]
        (COND
            ([AND (NULL (SETQ PLIST (READPLIST INS)))
                  (NOT (BSPOPENP INS 'INPUT]
             (GO BROKEN)))
        [SETQ NAME (COND
                      (NAMEONLY (OR (CADR (ASSOC 'NAME-BODY PLIST))
                                    ""))
                      (T (\FTP.PACKFILENAME (fetch FTPHOST of FTPCONNECTION)
                               PLIST T (fetch FTPDEVICEWANTED of GENSTATE]
        (COND
            ((AND FILTER (NOT (DIRECTORY.MATCH FILTER NAME)))
             (GO LP)))
        (replace FTPGENPLIST of GENSTATE with PLIST)
        (SETUPTIMER \FTP.IDLE.TIMEOUT (fetch FTPBUSY of FTPCONNECTION))
        [RETURN (OR NAME (AND FTPDEBUGFLG (HELP "Uninterpretable filename returned by ENUMERATE" PLIST]
     BROKEN
        (ERROR "File server broke connection before directory enumeration finished.  RETURN() to terminate
               enumeration." (fetch FTPHOST of FTPCONNECTION))
        (RETURN NIL])
```

(\FTP.FILEINFOFN
```
  [LAMBDA (GENSTATE ATTRIBUTE)                                          (* bvm%: "26-Apr-84 15:22")
    (\FTP.GETFILEINFO.FROM.PROPS (fetch FTPGENPLIST of GENSTATE)
          ATTRIBUTE])
```

(\FTP.GETFILEINFO
```
  [LAMBDA (STREAM ATTRIBUTE DEV)                                        ; Edited 19-Aug-88 11:54 by bvm
    (\FTP.GETFILEINFO.FROM.PROPS [COND
                                   ((type? STREAM STREAM)
                                    (fetch FTPFILEPROPS of STREAM))
                                   (T (\FTP.RECOGNIZEFILE STREAM DEV 'PROPS 'OLD (LIST (\FTP.FROM.LISP.ATTRIBUTE
                                                                                            ATTRIBUTE]
          ATTRIBUTE])
```

(\FTP.GETFILEINFO.FROM.PROPS
```
  [LAMBDA (PROPS ATTRIBUTE)                                             (* bvm%: " 5-May-84 16:31")
    (PROG (TMP)
```

```
                  (RETURN (SELECTQ ATTRIBUTE
                              (CREATIONDATE (CADR (ASSOC 'CREATION-DATE PROPS)))
                              (WRITEDATE (CADR (ASSOC 'WRITE-DATE PROPS)))
                              (READDATE (CADR (ASSOC 'READ-DATE PROPS)))
                              (ICREATIONDATE
                                  (IDATE (CADR (ASSOC 'CREATION-DATE PROPS))))
                              (IWRITEDATE (IDATE (CADR (ASSOC 'WRITE-DATE PROPS))))
                              (IREADDATE (IDATE (CADR (ASSOC 'READ-DATE PROPS))))
                              (LENGTH (MKATOM (CADR (ASSOC 'SIZE PROPS))))
                              (SIZE (AND (SETQ TMP (CADR (ASSOC 'SIZE PROPS)))
                                         (FIXP (SETQ TMP (MKATOM TMP)))
                                         (FOLDHI TMP BYTESPERPAGE)))
                              (TYPE [MKATOM (U-CASE (CADR (ASSOC ATTRIBUTE PROPS])
                              (BYTESIZE (MKATOM (CADR (ASSOC 'BYTE-SIZE PROPS))))
                              (CADR (ASSOC ATTRIBUTE PROPS])
```

(\FTP.FROM.LISP.ATTRIBUTE

```
   [LAMBDA (ATTR)                                                  ; Edited 19-Aug-88 11:48 by bvm
```

   ;; Returns FTP name for the specified Lisp attribute, or the attribute itself if unknown.

```
      (SELECTQ ATTR
          (BYTESIZE 'BYTE-SIZE)
          (LENGTH 'SIZE)
          ((CREATIONDATE ICREATIONDATE)
              'CREATION-DATE)
          ((WRITEDATE IWRITEDATE)
              'WRITE-DATE)
          ((READDATE IREADDATE)
              'READ-DATE)
          (EOLCONVENTION
              'END-OF-LINE-CONVENTION)
          ATTR])
```

)

(RPAQ? **\FTPAVAILABLE**)

(RPAQ? **\FTP.IDLE.TIMEOUT** 120000)

(RPAQ? ***FTP-IGNORE-SERVER-FULL***)

;; internal

(DEFINEQ

(\FTP.OPEN.CONNECTION

```
   [LAMBDA (HOST ECHOSTREAM FAILURESTRING)                        (* bvm%: " 6-Oct-86 13:57")
      (LET ((PORT (BESTPUPADDRESS HOST PROMPTWINDOW))
             INSTREAM)
           (if [AND PORT (SETQ INSTREAM (OPENBSPSTREAM [CONS (CAR PORT)
                                                              (COND
                                                                 ((EQ (CDR PORT)
                                                                      0)
                                                                  \PUPSOCKET.FTP)
                                                                 (T (CDR PORT]
                                                       NIL
                                                       (FUNCTION \FTP.ERRORHANDLER)
                                                       NIL NIL (FUNCTION \FTP.WHENCLOSED)
                                                       (OR FAILURESTRING "Can't open FTP connection"]
                then (if (TYPENAMEP INSTREAM 'STREAM)
                         then (SETQ INSTREAM (create FTPCONNECTION
                                                    FTPIN _ INSTREAM
                                                    FTPOUT _ (BSPOUTPUTSTREAM INSTREAM)
                                                    FTPHOST _ [\CANONICAL.HOSTNAME (COND
                                                                                     ((LITATOM HOST)
                                                                                      HOST)
                                                                                     (T (ETHERHOSTNAME PORT]
                                                    FTPBUSY _ T))
                              (if (\FTP.SENDVERSION INSTREAM ECHOSTREAM)
                                  then (push \FTPCONNECTIONS INSTREAM)
                                       INSTREAM
                                  else (CLOSEBSPSTREAM (fetch FTPIN of INSTREAM)))
                         else INSTREAM])
```

(FTP.BREAKCONNECTION

```
   [LAMBDA (HOST IDLEONLY)                                        (* bvm%: "28-Apr-85 14:51")
      (LET (HOSTS)
           (for STREAM in [for CONN in \FTPCONNECTIONS collect (pushnew HOSTS (fetch FTPHOST of CONN))
                                                               (fetch FTPIN of CONN)
                          when (AND (OR (EQ HOST T)
                                        (EQ HOST (fetch FTPHOST of CONN)))
                                    (OR (NULL IDLEONLY)
                                        (NULL (fetch FTPBUSY of CONN]
              do (CLOSEBSPSTREAM STREAM 5000))
           HOSTS])
```

(**FTP.SENDVERSION**
```
  [LAMBDA (CONNECTION ECHOSTREAM)                                    ; Edited 11-Jan-88 14:54 by bvm
    (PROG ((INS (fetch FTPIN of CONNECTION))
           (OUTS (fetch FTPOUT of CONNECTION)))
          (FTPPUTMARK OUTS (MARK# VERSION))
          (BOUT OUTS \FTP.VERSION)
          (PRIN3 "Xerox Lisp Ftp user" OUTS)
          (.EOC. OUTS)
          (RETURN (SELECTC (FTPGETMARK INS)
                       ((MARK# VERSION)
                         (COND
                            ((EQ (BIN INS)
                                 \FTP.VERSION)
                              (\FTP.FLUSH.TO.EOC INS ECHOSTREAM)))))
                       NIL])
```

(**FTP.WHENCLOSED**
```
  [LAMBDA (INSTREAM)                                                 (* bvm%: "15-SEP-83 23:06")
    (PROG [(CONN (find C in \FTPCONNECTIONS suchthat (EQ (fetch FTPIN of C)
                                                         INSTREAM]
          (COND
             (CONN (SETQ \FTPCONNECTIONS (DREMOVE CONN \FTPCONNECTIONS))
                   (AND FTPDEBUGFLG (printout FTPDEBUGLOG T "{FTP Connection with " (fetch FTPHOST of CONN)
                                   " closed}" T])
```

(**GETFTPCONNECTION**
```
  [LAMBDA (HOST UNWINDSAVE TRYHARD)                                  ; Edited 17-Nov-87 14:55 by bvm:
    (PROG ([H (\CANONICAL.HOSTNAME (if (LITATOM HOST)
                                       then HOST
                                       else (ETHERHOSTNAME HOST]
           CONNECTION)
          (if *FTP-IGNORE-SERVER-FULL*
              then (SETQ TRYHARD T))
     RETRY
          (RETURN (if [SETQ CONNECTION (OR (for CONN in \FTPCONNECTIONS
                                              when (AND (EQ (fetch FTPHOST of CONN)
                                                            H)
                                                        (NOT (fetch FTPBUSY of CONN))
                                                        (BSPOPENP (fetch FTPIN of CONN)
                                                                  'OUTPUT))
                                              do (replace FTPBUSY of CONN with T)
                                                 (replace ACCESS of (fetch FTPIN of CONN) with 'INPUT)
                                                                       ; Because \CLOSEFILE clobbered this field
                                                 (replace ACCESS of (fetch FTPOUT of CONN) with 'OUTPUT)
                                                 (RETURN CONN))
                                           (\FTP.OPEN.CONNECTION HOST (.FTPDEBUGLOG.)
                                                 (AND TRYHARD 'RETURN]
                      then (if (type? FTPCONNECTION CONNECTION)
                               then [if UNWINDSAVE
                                        then (RESETSAVE (PROGN (fetch FTPIN of CONNECTION))
                                                        '(AND RESETSTATE (CLOSEBSPSTREAM OLDVALUE 0]
                                    CONNECTION
                             elseif (AND TRYHARD (STRINGP CONNECTION))
                               then                                   ; Didn't get connection, but got error return of some sort (normal
                                                                      ; prompt message was suppressed).
                                    (if (STRPOS "FULL" CONNECTION NIL NIL NIL NIL UPPERCASEARRAY)
                                        then                          ; Got "server full" abort, try again later
                                             (BLOCK 5000)
                                             (GO RETRY)
                                        else                          ; Some other problem--print in prompt window before giving up.
                                             (CL:FORMAT PROMPTWINDOW "~%%Couldn't get FTP connection to ~A because:
                                                  ~A" H CONNECTION)
                                    NIL])
```

(**RELEASE.FTPCONNECTION**
```
  [LAMBDA (CONN)                                                     (* bvm%: "18-MAY-83 10:53")
    (replace FTPBUSY of CONN with NIL])
```

(**FTP.ERRORHANDLER**
```
  [LAMBDA (INSTREAM ERRCODE)                                         ; Edited 26-Nov-86 15:39 by bvm:
    (PROG (OUTSTREAM TMP)
          (RETURN (SELECTQ ERRCODE
                       (MARK.ENCOUNTERED
                         (COND
                            ((fetch FTPOPENP of INSTREAM)             ; If reading a file, this is EOF
                              (STREAMOP 'ENDOFSTREAMOP INSTREAM INSTREAM))
                            (T -1)))
                       (BAD.STATE.FOR.BOUT
                         (COND
                            ((AND (SETQ OUTSTREAM (BSPOUTPUTSTREAM INSTREAM))
                                  (fetch FTPOPENP of OUTSTREAM))
```

```
                                                             ; Writing a file, and partner timed out.  Hard to recover from this
                        (ERROR "File server has broken connection" (fetch FULLFILENAME of OUTSTREAM)))
                       (T                                        ; Just protocol stuff.  Let it go by, and catch the error on the next
                                                                 ; input
                          NIL)))
                   (BAD.STATE.FOR.BIN
                        (COND
                          ((fetch FTPOPENP of INSTREAM)          ; Could recover by reopening file
                            (\FTP.FIX.BROKEN.INPUT INSTREAM))
                          ((SETQ TMP (STKPOS 'READPLIST))        ; Reading a plist, can't just barf in the middle
                            (RETFROM TMP NIL T))
                          (T                                     ; Act like end of file
                            -1)))
                   (BAD.GETMARK (COND
                                   ((BSPOPENP INSTREAM 'INPUT)
                                    (MARK# NOTAMARK))
                                   (T (MARK# BROKEN))))
                   (ERROR ERRCODE (AND INSTREAM (OR (fetch FULLFILENAME of INSTREAM)
                                                    (AND (SETQ OUTSTREAM (BSPOUTPUTSTREAM INSTREAM))
                                                         (fetch FULLFILENAME of OUTSTREAM))
                                                    (AND (SETQ OUTSTREAM (BSPFRNADDRESS INSTREAM))
                                                         (ETHERHOSTNAME OUTSTREAM T]
```

(**FTP.FIX.BROKEN.INPUT**

```
  [LAMBDA (INSTREAM)                                               (* bvm%: "28-Apr-85 14:15")

    ;; Called when remote server breaks connection in midstream.  Try to reopen and set fileptr to the right place

    (PROG ((FULLNAME (fetch FULLFILENAME of INSTREAM))
           (PROPS (fetch FTPFILEPROPS of INSTREAM))
           (POS (GETFILEPTR INSTREAM))
           NEWSTREAM)
          (printout PROMPTWINDOW T "File server broke connection while reading " FULLNAME " at byte " .P2 POS
                 '|...|)
          (COND
             ((SETQ NEWSTREAM (\FTP.OPENFILE.FROM.PLIST (FILENAMEFIELD FULLNAME 'HOST)
                                       [\FTP.ADD.USERINFO (for PAIR in PROPS collect PAIR
                                                            when (FMEMB (CAR PAIR)
                                                              '(NAME-BODY VERSION DIRECTORY DEVICE
                                                                          SERVER-FILENAME]
                                       'INPUT))
               (\SMASHBSPSTREAM NEWSTREAM INSTREAM)              ; Smash new stream into old, so we are now using INSTREAM
                                                                 ; again
               (for CONN in \FTPCONNECTIONS when (EQ (fetch FTPIN of CONN)
                                                     NEWSTREAM)
                  do (replace FTPIN of CONN with INSTREAM)
                     (replace FTPOUT of CONN with (BSPOUTPUTSTREAM INSTREAM))
                     (RETURN))
               (\BSP.DECLARE.FILEPTR INSTREAM 0)
               (printout PROMPTWINDOW T "Reopening file and restoring fileptr...")
               (SETFILEPTR INSTREAM POS)
               (printout PROMPTWINDOW "done.")
               (RETURN T))
             (T (ERROR "File server broke connection; unable to reestablish" FULLNAME])
```

(**FTP.CLEANUP**

```
  [LAMBDA NIL                                                      (* bvm%: "19-AUG-83 16:19")

    ;; Process that sits watching to see if an FTP connection has been idle too long

    (DECLARE (SPECVARS CONNS FAIL))
    (PROG ((TIMER (SETUPTIMER 0))
           (INTERVAL (LRSH \FTP.IDLE.TIMEOUT 1))
           CONNS)
      SLEEP
          (SETUPTIMER INTERVAL TIMER)
          (do (BLOCK NIL TIMER) until (TIMEREXPIRED? TIMER))
      LP1 (COND
             ((NULL (SETQ CONNS \FTPCONNECTIONS))
              (RETURN)))
      LP2 (COND
             ([AND (FIXP (fetch FTPBUSY of (CAR CONNS)))
                   (TIMEREXPIRED? (fetch FTPBUSY of (CAR CONNS)))
                   (NOT (PROG (FAIL)
                              [MAP.PROCESSES (FUNCTION (LAMBDA (PROC)
                                                        (COND
                                                          ((EQ (PROCESS.EVALV PROC 'FTPCONNECTION)
                                                               (CAR CONNS))
                                                           (SETQ FAIL T]
                              (RETURN FAIL]

              ;; Timer expired AND there is nobody actively using this connection.  Latter is important in case the remote server was just slow to
              ;; answer.  Ideal solution would be to see if anyone has a pointer to the generator, but that takes gc changes

              (CLOSEBSPSTREAM (fetch FTPIN of (CAR CONNS)))
              (GO LP1)))
          (COND
             ((SETQ CONNS (CDR CONNS))
```

```
                    (GO LP2)))
              (GO SLEEP)])
```

(**FTP.ASSURE.CLEANUP**
```
   [LAMBDA NIL                                                     (* bvm%: "19-AUG-83 16:12")
      (OR (FIND.PROCESS '\FTP.CLEANUP)
          (ADD.PROCESS '(\FTP.CLEANUP)
                'RESTARTABLE
                'NO])
```

)

(ADDTOVAR **FTPCONNECTIONS**)

(DEFINEQ

FTP.HANDLE.NO
```
   [LAMBDA (CONNECTION BADPLIST ECHOSTREAM CODE LEAVEMARK NOERRORFLG DESTPLIST)
                                                      ; Edited 17-Nov-87 18:17 by bvm:
      (PROG ((INSTREAM (fetch FTPIN of CONNECTION))
             (HOST (fetch FTPHOST of CONNECTION))
             [FLUSHER (COND
                        (LEAVEMARK (FUNCTION \FTP.FLUSH.TO.MARK))
                        (T (FUNCTION \FTP.FLUSH.TO.EOC]
             INFO CPASS CNAME NEWNAME)
            (SELECTC (OR CODE (SETQ CODE (FTPGETCODE INSTREAM T)))
                (\NO.FILE.NOT.FOUND
                    (APPLY* FLUSHER INSTREAM (OR ECHOSTREAM (.FTPDEBUGLOG.)))
                    (RETURN))
                ((LIST \NO.BAD.TRANSFER.PARMS \NO.BAD.EOLCONVENTION)
                    (COND
                        ((AND (SETQ INFO (ASSOC 'END-OF-LINE-CONVENTION BADPLIST))
                              (NEQ (CADR INFO)
                                   'CR))
                         (RPLACA (CDR INFO)
                                 'CR)                             ; Fall back on EOL = CR, which everyone must support
                         (APPLY* FLUSHER INSTREAM (OR ECHOSTREAM (.FTPDEBUGLOG.)))
                         (RETURN T))))
                (\NO.FILE.PROTECTED    ;; We are very dependent on precedence of errors.  The code here assumes that if I specified
                                       ;; CONNECT-NAME and still got a protection error, then there is nothing I can do--had the name been
                                       ;; illegal or it required a password, I would have gotten a connect name/pass error instead.  This is
                                       ;; especially a problem for the RENAME command, since the error return gives no indication as to
                                       ;; whether it is the source or the destination that has the problem.  We solve it here by making the source
                                       ;; good first, then if we still get errors, the problem must be in the destination.
                    (if (COND
                            ((NULL (SETQ CNAME (ASSOC 'CONNECT-NAME BADPLIST)))
                                                              ; First time thru--try adding connect name for the main file.
                             [NCONC1 BADPLIST (LIST 'CONNECT-NAME (\FTP.DIRECTORYNAMEONLY
                                                                     (CADR (ASSOC 'DIRECTORY BADPLIST]
                             T)
                            ([AND DESTPLIST (NOT (STRING-EQUAL (CADR CNAME)
                                                         (SETQ NEWNAME (\FTP.DIRECTORYNAMEONLY
                                                                  (CADR (ASSOC 'DIRECTORY DESTPLIST]
                                                              ; Destination directory is different than source--maybe that's the
                                                              ; problem.  Oddly enough, IFS doesn't let us give separate
                                                              ; connect passwords for the source and destination, so have to
                                                              ; do it all in main plist.
                             (RPLACA (CDR CNAME)
                                     NEWNAME)
                             (if (SETQ CPASS (ASSOC 'CONNECT-PASSWORD BADPLIST))
                                 then (RPLACA (CDR CPASS)
                                              ""))
                             T))
                        then                                      ; Flush the error message, try again
                            (APPLY* FLUSHER INSTREAM (OR ECHOSTREAM (.FTPDEBUGLOG.)))
                            (RETURN T)))
                (\NO.ILLEGAL.CONNECTPASSWORD                       ; Connect Password error
                    [SETQ CNAME (MKATOM (CADR (ASSOC 'CONNECT-NAME BADPLIST]
                    (if (AND (NULL (SETQ CPASS (ASSOC 'CONNECT-PASSWORD BADPLIST)))
                             (SETQ INFO (\INTERNAL/GETPASSWORD HOST NIL CNAME)))
                        then                                      ; quietly get a connect password and try again.  Thus usually
                                                                  ; gets us the null password unless a real one has been
                                                                  ; previously cached.
                            (NCONC1 BADPLIST (LIST 'CONNECT-PASSWORD (CDR INFO)))
                            (APPLY* FLUSHER INSTREAM (OR ECHOSTREAM (.FTPDEBUGLOG.)))
                            (RETURN T)
                        else                                      ; Fall thru to process the noisy way
                            ))
                NIL)
        GENERAL.FAILURE
            (printout [OR ECHOSTREAM (SETQ ECHOSTREAM (GETSTREAM PROMPTWINDOW 'OUTPUT]
                   T HOST ": ")
              (COND
                ((APPLY* FLUSHER INSTREAM ECHOSTREAM)
                 (SELECTC CODE
```

```
                            ((LIST \NO.ILLEGAL.USERNAME \NO.ILLEGAL.USERPASSWORD)
                                                                           ; User Password errors
                                 (RETURN (COND
                                            ((SETQ INFO (\INTERNAL/GETPASSWORD HOST T NIL NIL))
                                               (for PAIR in BADPLIST do (SELECTQ (CAR PAIR)
                                                                            (USER-NAME (FRPLACA (CDR PAIR)
                                                                                             (CAR INFO)))
                                                                            (USER-PASSWORD
                                                                                 (FRPLACA (CDR PAIR)
                                                                                        (CDR INFO)))
                                                                            NIL))
                                             T))))
                            (\NO.ILLEGAL.CONNECTPASSWORD                        ; Connect Password error
                                  [RETURN
                                    (COND
                                       ((SETQ INFO (\INTERNAL/GETPASSWORD HOST T CNAME NIL))
                                        [COND
                                           (CPASS (FRPLACA (CDR CPASS)
                                                        (CDR INFO)))
                                           (T (NCONC1 BADPLIST (LIST 'CONNECT-PASSWORD (CDR INFO]
                                         T)
                                       ((AND (NOT NOERRORFLG)
                                             (LISPERROR "PROTECTION VIOLATION"
                                                     (\FTP.PACKFILENAME
                                                      HOST
                                                      (if [OR (NULL DESTPLIST)
                                                              (STRING-EQUAL CNAME (\FTP.DIRECTORYNAMEONLY
                                                                                    (CADR (ASSOC 'DIRECTORY BADPLIST]
                                                          then BADPLIST
                                                          else                    ; Problem is probably with the destination
                                                                   DESTPLIST)
                                                      NIL T])
                            (\NO.ILLEGAL.NAME.ERRORS
                                  (OR NOERRORFLG (LISPERROR "BAD FILE NAME" (\FTP.PACKFILENAME HOST BADPLIST NIL T))))
                            (\NO.STORAGE.FULL
                                  (OR NOERRORFLG (LISPERROR "FILE SYSTEM RESOURCES EXCEEDED" (\FTP.PACKFILENAME HOST
                                                                                        BADPLIST NIL T))))
                            (\NO.FILE.PROTECTED
                                  (OR NOERRORFLG (LISPERROR "PROTECTION VIOLATION" (\FTP.PACKFILENAME HOST BADPLIST NIL T))
                                  ))
                            (GO WONT.OPEN)))
                      (T (\FTPERROR CONNECTION)))
              (RETURN)
        WONT.OPEN
              (OR NOERRORFLG (LISPERROR "FILE WON'T OPEN" (\FTP.PACKFILENAME HOST BADPLIST NIL T])
```

(**FTP.DIRECTORYNAMEONLY**

```
  [LAMBDA (DIRNAME)                                             ; Edited 16-Nov-87 16:09 by bvm
    (LET ((N (STRPOS '> DIRNAME)))
         (COND
            (N (SUBSTRING DIRNAME 1 (- N 1)))
            (T DIRNAME])
```

(**FTP.EOL.FROM.PLIST**

```
  [LAMBDA (PLIST)                                               (* bvm%: "21-NOV-83 15:33")
    (for PAIR in PLIST when (EQ (CAR PAIR)
                               'END-OF-LINE-CONVENTION)
       do (RETURN (SELECTQ (CADR PAIR)
                      (LF LF.EOLC)
                      (CRLF CRLF.EOLC)
                      CR.EOLC))
       finally (RETURN CR.EOLC])
```

(**FTP.MAKEPLIST**

```
  [LAMBDA (FILENAME HOST DESIREDPROPS)                          (* bvm%: " 4-JUN-83 21:35")
    (PROG ((INFO (\INTERNAL/GETPASSWORD HOST)))
          (RETURN (CONS (LIST 'USER-NAME (CAR INFO))
                      (CONS (LIST 'USER-PASSWORD (CDR INFO))
                          (CONS (LIST 'SERVER-FILENAME FILENAME)
                              (for PROP inside DESIREDPROPS collect (LIST 'DESIRED-PROPERTY PROP])
```

(**FTP.PRINTPLIST**

```
  [LAMBDA (STREAM PLIST)                                        ; Edited 11-Jan-88 16:09 by bvm
    (BOUT STREAM (CHARCODE %())
    (for PAIR in PLIST do (for ITEM in PAIR bind (BEFORE _ (CHARCODE %())
                                                 ISPASSWORD
                              do (BOUT STREAM BEFORE)
                                 (SETQ BEFORE (CHARCODE SPACE))
                                 [for CH inpname ITEM do (SELCHARQ (COND
                                                                      (ISPASSWORD (SETQ CH (\DECRYPT.PWD.CHAR CH)))
                                                                      (T CH))
                                                              ((%( %))
                                                               (BOUT STREAM (CHARCODE %']))
```

```
                                                                NIL)
                                               (BOUT STREAM (COND
                                                              ((ILEQ CH \MAXTHINCHAR)
                                                               CH)
                                                              (T
                                                              ; Illegal, try something hopeless
                                                                (CHARCODE %#^A]
                             (SELECTQ ITEM
                                 ((USER-PASSWORD CONNECT-PASSWORD)
                                     (SETQ ISPASSWORD T))
                                 NIL))
                             (BOUT STREAM (CHARCODE %))))
     (BOUT STREAM (CHARCODE %)))
     (COND
        (FTPDEBUGFLG (PRIN2 PLIST FTPDEBUGLOG)))
     STREAM])
```

(**FTP.PACKFILENAME**
```
  [LAMBDA (HOST PLIST PRESERVECASE DEVICEWANTED)                          ; Edited 11-Jan-88 16:54 by bvm
    (PROG (NAMEBODY VERSION SERVERNAME DEVICE DIR FIELDS NAME I)
          (for PAIR in PLIST do (SELECTQ (CAR PAIR)
                                    (DIRECTORY (COND
                                                 ((SETQ DIR (CADR PAIR))
                                                  (SELCHARQ (CHCON1 DIR)
                                                     (%[ [COND
                                                            ((EQ (NTHCHARCODE DIR -1)
                                                                 (CHARCODE %]))
                                                             ; patch around buggy VMS server
                                                             (SETQ DIR (SUBSTRING DIR 2 -2])
                                                     (/            ; UNIX returns a /, although Interlisp always uses complete
                                                                   ; directory names
                                                         (SETQ DIR (SUBSTRING DIR 2 -1)))
                                                     NIL))))
                                    (DEVICE [COND
                                               (DEVICEWANTED (SETQ DEVICE (CADR PAIR]))
                                    (NAME-BODY (SETQ NAMEBODY (CADR PAIR)))
                                    (VERSION (SETQ VERSION (CADR PAIR)))
                                    (SERVER-FILENAME
                                        (SETQ SERVERNAME (CADR PAIR)))
                                    NIL))
          [SETQ NAME (COND
                        [NAMEBODY                                         ; Pack up the name right to left
                            (SETQ NAMEBODY (\FTP.ADD.QUOTES NAMEBODY))
                            [COND
                               (VERSION                  ; Note that some Unix servers won't give a version
                                   (SETQ FIELDS (LIST '; VERSION))
                                   (COND
                                      ((NOT (SETQ I (STRPOS '%. NAMEBODY)))
                                                          ; Extensionless file looks like FOO.;3, but leave versionless files
                                                          ; alone.  This includes the output of broken unix servers that
                                                          ; think "FOO;3" is a NAME-BODY
                                          (push FIELDS '%.))
                                      ((AND (EQ I (NCHARS NAMEBODY))
                                            (EQ (GETHOSTINFO HOST 'OSTYPE)
                                                'IFS))   ; IFS file with a dot at the end needs to be quoted, or else the dot
                                                          ; will get swallowed.
                                          (SETQ NAMEBODY (CONCAT (SUBSTRING NAMEBODY 1 (SUB1 I))
                                                                 "'."]
                            (push FIELDS NAMEBODY)
                            [COND
                               (DIR (push FIELDS '< (\FTP.ADD.QUOTES DIR)
                                          '>]
                            (COND
                               (DEVICE [COND
                                          ((AND (NEQ DEVICEWANTED T)
                                                (NOT (STREQUAL DEVICE DEVICEWANTED))
                                                SERVERNAME
                                                (SETQ I (STRPOS ":" SERVERNAME)))
                                                          ; Ugh, VMS puts a different device in the DEVICE field than in
                                                          ; SERVER-FILENAME field
                                             (SETQ DEVICE (SUBSTRING SERVERNAME 1 (SUB1 I]
                                          (if (NEQ (NTHCHARCODE DEVICE -1)
                                                   (CHARCODE ":"))
                                              then (push FIELDS '%:))
                                          (push FIELDS (\FTP.ADD.QUOTES DEVICE]
                               (SERVERNAME (SETQ FIELDS (LIST SERVERNAME)))
                               (T (RETURN]
          (push FIELDS '{ HOST '})
          (SETQ NAME (CONCATLIST FIELDS))
          (RETURN (COND
                     ((OR PRESERVECASE (NOT *UPPER-CASE-FILE-NAMES*))
                                                          ; Give me the name straight.
                       NAME)
                     (T (MKATOM (U-CASE NAME])
```

(\FTP.ADD.QUOTES
```
  [LAMBDA (NAME)                                                           ; Edited 11-Jan-88 16:52 by bvm

    ;; The only funny char we know about is quote, so quote all the quotes with a quote.

    (bind (N _ 1)
          I PIECES while (SETQ I (STRPOS "'" NAME N)) do (push PIECES "'" (SUBSTRING NAME N I))
                                                         (SETQ N (ADD1 I))
        finally (RETURN (if PIECES
                            then (if (<= N (NCHARS NAME))
                                     then (push PIECES (SUBSTRING NAME N)))
                                 (CONCATLIST (DREVERSE PIECES))
                            else                                           ; nothing got quoted
                                 NAME])
```

(\FTP.PACK.DIRECTORYNAMEP
```
  [LAMBDA (CONNECTION PLIST)                                              (* lmm "25-Mar-85 14:38")
    (PROG [(DIRECTORY (CADR (ASSOC 'DIRECTORY PLIST)))
           (DEVICE (CADR (ASSOC 'DEVICE PLIST]
          (RETURN (PACKFILENAME.STRING 'HOST (fetch FTPHOST of CONNECTION)
                    'DEVICE DEVICE 'DIRECTORY DIRECTORY])
```

(\FTP.UNPACKFILENAME
```
  [LAMBDA (FILENAME NOLOGIN)                                              ; Edited 16-Nov-87 17:43 by bvm
    (LET ((FIELDS (UNPACKFILENAME.STRING FILENAME))
          PLIST HOST DEVICE DIR NAME EXT INFO)
         (for TAIL on FIELDS by (CDDR TAIL) do (SELECTQ (CAR TAIL)
                                                 (HOST (SETQ HOST (CADR TAIL)))
                                                 (DIRECTORY (SETQ DIR (CADR TAIL)))
                                                 (DEVICE (SETQ DEVICE (CADR TAIL)))
                                                 (NAME (SETQ NAME (CADR TAIL)))
                                                 (EXTENSION (SETQ EXT (CADR TAIL)))
                                                 (VERSION (push PLIST (LIST 'VERSION (CADR TAIL))))
                                                 NIL))
         (COND
            ((AND HOST (SETQ HOST (\CANONICAL.HOSTNAME HOST)))
             [push PLIST (LIST 'NAME-BODY (COND
                                            ((AND EXT (> (NCHARS EXT)
                                                         0))
                                             (CONCAT NAME '%. EXT))
                                            (T NAME]
             [COND
                (DIR [COND
                        ((EQ (GETHOSTINFO HOST 'OSTYPE)
                             'UNIX)                                       ; Coerce directory name to lowercase, get rid of trailing /
                         [COND
                            ((EQ (NTHCHARCODE DIR -1)
                                 (CHARCODE /))
                             (SETQ DIR (SUBSTRING DIR 1 -2]
                         [COND
                            ((NEQ (NTHCHARCODE DIR 1)
                                  (CHARCODE /))
                             (SETQ DIR (CONCAT '/ DIR]
                         (COND
                            ((U-CASEP DIR)
                             (SETQ DIR (L-CASE DIR]
                      (push PLIST (LIST 'DIRECTORY DIR]
             [COND
                (DEVICE (push PLIST (LIST 'DEVICE DEVICE]
             (CONS HOST (if NOLOGIN
                            then PLIST
                          else (\FTP.ADD.USERINFO PLIST HOST])
```

(\FTP.ADD.USERINFO
```
  [LAMBDA (PLIST HOST)                                                    (* bvm%: "27-OCT-83 15:50")
    (PROG ((INFO (\INTERNAL/GETPASSWORD HOST)))
          (push PLIST (LIST 'USER-NAME (CAR INFO))
                (LIST 'USER-PASSWORD (CDR INFO)))
          (RETURN PLIST])
```

(\FTP.FLUSH.TO.EOC
```
  [LAMBDA (INSTREAM ECHOSTREAM)                                           (* bvm%: "13-JUN-83 15:36")

    ;; Eat bytes from the input side of CONNECTION up to next mark, copying bytes to ECHOSTREAM if given, and return T if the mark is EOC

    (PROG ([STREAM (AND ECHOSTREAM (GETSTREAM ECHOSTREAM 'OUTPUT]
           CH)
          (while (NEQ (SETQ CH (BIN INSTREAM))
                      -1)
             do (AND STREAM (\OUTCHAR STREAM CH)))
          (RETURN (EQ (FTPGETMARK INSTREAM)
                      (MARK# EOC])
```

(\FTP.FLUSH.TO.MARK

```
    [LAMBDA (INSTREAM ECHOSTREAM)                                    (* bvm%: " 7-JUL-83 12:08")
      (bind CH [STREAM _ (AND ECHOSTREAM (GETSTREAM ECHOSTREAM 'OUTPUT] while (NEQ (SETQ CH (BIN INSTREAM))
                                                                     -1)
         do (AND STREAM (\OUTCHAR STREAM CH)))
      T])
```

(\FTPERROR

```
    [LAMBDA (CONNECTION ERRMSG ERRARG)                               (* bvm%: "11-Jul-84 15:33")
      (COND
        (FTPDEBUGFLG (printout FTPDEBUGLOG T "{FTP Protocol violation, aborted}" T)
              (HELP)))
      (CLOSEBSPSTREAM (COND
                        ((type? STREAM CONNECTION)
                         CONNECTION)
                        (T (fetch FTPIN of CONNECTION)))
              1000)
      (COND
        (ERRMSG (ERROR (COND
                         ((EQ ERRMSG T)
                          "FTP Protocol violation")
                         (T ERRMSG))
                       ERRARG])
)
```

;; for debugging

```
(DEFINEQ
```

(FTPDEBUG

```
    [LAMBDA (FLG REGION)                                             ; Edited 16-Nov-87 16:13 by bvm
      (SETQ FTPDEBUGLOG (CREATEW REGION "FTP Debug info"))
      [WINDOWPROP FTPDEBUGLOG 'CLOSEFN (FUNCTION (LAMBDA (WINDOW)
                                                   (AND (EQ (WINDOWPROP WINDOW 'DSP)
                                                            FTPDEBUGLOG)
                                                        (SETQ FTPDEBUGLOG (SETQ FTPDEBUGFLG NIL]
      [WINDOWPROP FTPDEBUGLOG 'SHRINKFN (FUNCTION (LAMBDA (WINDOW)

                                                    ;; Suspend tracing while window shrunk

                                                    (AND (EQ (WINDOWPROP WINDOW 'DSP)
                                                             FTPDEBUGLOG)
                                                         (SETQ FTPDEBUGFLG NIL]
      [WINDOWPROP FTPDEBUGLOG 'EXPANDFN (FUNCTION (LAMBDA (WINDOW)

                                                    ;; Turn back on when expanded

                                                    (AND (EQ (WINDOWPROP WINDOW 'DSP)
                                                             FTPDEBUGLOG)
                                                         (SETQ FTPDEBUGFLG T]
      (SETQ FTPDEBUGLOG (WINDOWPROP FTPDEBUGLOG 'DSP))
      (DSPFONT (FONTCREATE 'GACHA 8)
            FTPDEBUGLOG)
      (DSPSCROLL T FTPDEBUGLOG)
      (SETQ FTPDEBUGFLG T])
```

(FTPPRINTMARK

```
    [LAMBDA (MARK)                                                   (* bvm%: "25-Aug-84 21:58")
      [COND
        (FTPDEBUGFLG (printout FTPDEBUGLOG "[" (OR (CADR (FASSOC MARK (LISTP FTPMARKTYPES)))
                                                  MARK)
                             "]")
              (COND
                ((EQ MARK (MARK# EOC))
                 (TERPRI FTPDEBUGLOG]
      MARK])
```

(FTPPRINTCODE

```
    [LAMBDA (CODE NOCODEP)                                           (* bvm%: "20-AUG-83 00:12")
      (COND
        (FTPDEBUGFLG (PRIN1 '{ FTPDEBUGLOG)
              (COND
                (NOCODEP (PRINTCONSTANT CODE FTPNOCODES FTPDEBUGLOG "\NO."))
                (T (PRINTNUM '(FIX 1)
                           CODE FTPDEBUGLOG)))
              (PRIN1 '} FTPDEBUGLOG)))
      CODE])
```

(FTPGETMARK

```
    [LAMBDA (STREAM)                                                 (* bvm%: "23-Nov-86 15:50")
      (bind MARK while (EQ (SETQ MARK (FTPPRINTMARK (BSPGETMARK STREAM)))
                         (MARK# COMMENT))
         do (\FTP.FLUSH.TO.MARK STREAM (.FTPDEBUGLOG.)) finally (RETURN MARK])
```

(**FTPPUTMARK**
  [LAMBDA (STREAM MARK)   (* bvm%: "12-MAY-83 10:24")
    (BSPPUTMARK STREAM (**FTPPRINTMARK** MARK])

(**FTPPUTCODE**
  [LAMBDA (STREAM CODE NOCODEP)   (* bvm%: "20-AUG-83 00:12")
    (BOUT STREAM (**FTPPRINTCODE** CODE NOCODEP])

(**FTPGETCODE**
  [LAMBDA (STREAM NOCODEP)   (* bvm%: "20-AUG-83 00:17")
    (**FTPPRINTCODE** (BIN STREAM)
        NOCODEP])
)

(RPAQ? **FTPDEBUGLOG**)

(RPAQ? **FTPDEBUGFLG**)

(DECLARE%: EVAL@COMPILE DONTCOPY

(RPAQQ **FTPMARKTYPES**
        ((1 RETRIEVE)
         (2 STORE)
         (3 YES)
         (4 NO)
         (5 HERE-IS-FILE)
         (6 EOC)
         (7 COMMENT)
         (8 VERSION)
         (9 NEW-STORE)
         (10 ENUMERATE)
         (11 HERE-IS-PLIST)
         (12 NEW-ENUMERATE)
         (14 DELETE)
         (15 RENAME)
         (16 STORE-MAIL)
         (17 RETRIEVE-MAIL)
         (18 FLUSH-MAILBOX)
         (19 MAILBOX-EXCEPTION)
         (253 NOTAMARK)
         (254 BROKEN)))

(DECLARE%: EVAL@COMPILE

(RPAQQ **FTP.VERSION** 1)

(CONSTANTS \FTP.VERSION)
)

(RPAQQ **FTPNOCODES**
        ((\NO.UNIMPLEMENTED 1)
         (\NO.PROTOCOL.ERROR 3)
         (\NO.BAD.PLIST 8)
         (\NO.ILLEGAL.DIRECTORY 10)
         (\NO.ILLEGAL.NAME.ERRORS '(9 10 11 12 25))
         (\NO.BAD.EOLCONVENTION 15)
         (\NO.ILLEGAL.USERNAME 16)
         (\NO.ILLEGAL.USERPASSWORD 17)
         (\NO.ILLEGAL.CONNECTNAME 19)
         (\NO.ILLEGAL.CONNECTPASSWORD 20)
         (\NO.FILE.NOT.FOUND 64)
         (\NO.FILE.PROTECTED 65)
         (\NO.BAD.TRANSFER.PARMS 66)
         (\NO.DISK.ERROR 67)
         (\NO.STORAGE.FULL 68)
         (\NO.UNSPECIFIED.ERRORS '(71 72))
         (\NO.FILE.BUSY 73)
         (\NO.RENAME.DESTINATION.EXISTS 74)))

(DECLARE%: EVAL@COMPILE

(RPAQQ **NO.UNIMPLEMENTED** 1)

(RPAQQ **NO.PROTOCOL.ERROR** 3)

(RPAQQ **NO.BAD.PLIST** 8)

(RPAQQ **NO.ILLEGAL.DIRECTORY** 10)

(RPAQQ **NO.ILLEGAL.NAME.ERRORS** (9 10 11 12 25))

(RPAQQ **NO.BAD.EOLCONVENTION** 15)

(RPAQQ **NO.ILLEGAL.USERNAME** 16)

(RPAQQ **NO.ILLEGAL.USERPASSWORD** 17)

(RPAQQ **NO.ILLEGAL.CONNECTNAME** 19)

(RPAQQ **NO.ILLEGAL.CONNECTPASSWORD** 20)

(RPAQQ **NO.FILE.NOT.FOUND** 64)

(RPAQQ **NO.FILE.PROTECTED** 65)

(RPAQQ **NO.BAD.TRANSFER.PARMS** 66)

(RPAQQ **NO.DISK.ERROR** 67)

(RPAQQ **NO.STORAGE.FULL** 68)

(RPAQQ **NO.UNSPECIFIED.ERRORS** (71 72))

(RPAQQ **NO.FILE.BUSY** 73)

(RPAQQ **NO.RENAME.DESTINATION.EXISTS** 74)

```
(CONSTANTS (\NO.UNIMPLEMENTED 1)
       (\NO.PROTOCOL.ERROR 3)
       (\NO.BAD.PLIST 8)
       (\NO.ILLEGAL.DIRECTORY 10)
       (\NO.ILLEGAL.NAME.ERRORS '(9 10 11 12 25))
       (\NO.BAD.EOLCONVENTION 15)
       (\NO.ILLEGAL.USERNAME 16)
       (\NO.ILLEGAL.USERPASSWORD 17)
       (\NO.ILLEGAL.CONNECTNAME 19)
       (\NO.ILLEGAL.CONNECTPASSWORD 20)
       (\NO.FILE.NOT.FOUND 64)
       (\NO.FILE.PROTECTED 65)
       (\NO.BAD.TRANSFER.PARMS 66)
       (\NO.DISK.ERROR 67)
       (\NO.STORAGE.FULL 68)
       (\NO.UNSPECIFIED.ERRORS '(71 72))
       (\NO.FILE.BUSY 73)
       (\NO.RENAME.DESTINATION.EXISTS 74))
)

(DECLARE%: EVAL@COMPILE
```

(PUTPROPS **MARK#** MACRO [X (OR [CAR (**find** M **in** FTPMARKTYPES **suchthat** (EQ (CADR M)
                                                                           (CAR X]
                                      (HELP "Unknown mark type" (CAR X)))

```
(PUTPROPS .EOC. MACRO ((STREAM)
                         (FTPPUTMARK STREAM (MARK# EOC))))
```

(PUTPROPS **.FTPDEBUGLOG.** MACRO (NIL (AND FTPDEBUGFLG FTPDEBUGLOG)))
)

(PUTPROPS **MARK#** INFO NOEVAL)

(DECLARE%: EVAL@COMPILE

```
(RECORD FTPCONNECTION (FTPIN FTPOUT FTPHOST FTPBUSY FTPCURRENTFILE)
       (TYPE? LISTP))
```

```
(ACCESSFNS FTPSTREAM ((FTPFILEPROPS (fetch F5 of DATUM)
                                     (replace F5 of DATUM with NEWVALUE)))
       (SYNONYM FTPFILEPROPS (FTPOPENP)))
```

(RECORD FTPFILEGENSTATE (FTPGENCONNECTION FTPGENPLIST FTPDEVICEWANTED FTPNAMEFILTER))
)

(DECLARE%: DOEVAL@COMPILE DONTCOPY

(GLOBALVARS FTPDEBUGFLG \FTPCONNECTIONS \FTPAVAILABLE \FTP.IDLE.TIMEOUT \BSPFDEV \FTPFDEV)
)
)

(DECLARE%: DONTEVAL@LOAD DOCOPY

(**FTPINIT**)
)

FUNCTION INDEX

CONSTANT INDEX

VARIABLE INDEX

RECORD INDEX

MACRO INDEX

PROPERTY INDEX