```
   CCCCCCCCCCC     OOOOOOOOO     PPPPPPPPPPPP     YYY         YYY
   CCCCCCCCCCC     OOOOOOOOO     PPPPPPPPPPPP     YYY         YYY
   CCCCCCCCCCC     OOOOOOOOO     PPPPPPPPPPPP     YYY         YYY
CCC               OOO     OOO   PPP         PPP  YYY         YYY
CCC               OOO     OOO   PPP         PPP  YYY         YYY
CCC               OOO     OOO   PPP         PPP  YYY         YYY
CCC               OOO     OOO   PPP         PPP     YYY   YYY
CCC               OOO     OOO   PPP         PPP     YYY   YYY
CCC               OOO     OOO   PPP         PPP     YYY   YYY
CCC               OOO     OOO   PPPPPPPPPPPP            YYY
CCC               OOO     OOO   PPPPPPPPPPPP            YYY
CCC               OOO     OOO   PPPPPPPPPPPP            YYY
CCC               OOO     OOO   PPP                     YYY
CCC               OOO     OOO   PPP                     YYY
CCC               OOO     OOO   PPP                     YYY
CCC               OOO     OOO   PPP                     YYY
CCC               OOO     OOO   PPP                     YYY
CCC               OOO     OOO   PPP                     YYY
   CCCCCCCCCCC     OOOOOOOOO     PPP                     YYY
   CCCCCCCCCCC     OOOOOOOOO     PPP                     YYY
   CCCCCCCCCCC     OOOOOOOOO     PPP                     YYY
```

```
  CCCCCCCC    OOOOOO    PPPPPPPP    YY      YY
  CCCCCCCC    OOOOOO    PPPPPPPP    YY      YY
CC            OO  OO    PP    PP    YY      YY
CC            OO  OO    PP    PP    YY      YY
CC            OO  OO    PP    PP      YY  YY
CC            OO  OO    PP    PP      YY  YY
CC            OO  OO    PPPPPPPP        YY
CC            OO  OO    PPPPPPPP        YY
CC            OO  OO    PP              YY
CC            OO  OO    PP              YY
CC            OO  OO    PP              YY          ....
CC            OO  OO    PP              YY          ....
  CCCCCCCC    OOOOOO    PP              YY          ....
  CCCCCCCC    OOOOOO    PP              YY          ....


RRRRRRRR    EEEEEEEEEE    QQQQQQ
RRRRRRRR    EEEEEEEEEE    QQQQQQ
RR      RR  EE            QQ    QQ
RR      RR  EE            QQ    QQ
RR      RR  EE            QQ    QQ
RR      RR  EE            QQ    QQ
RRRRRRRR    EEEEEEEE      QQ    QQ
RRRRRRRR    EEEEEEEE      QQ    QQ
RR  RR      EE            QQ  QQ  QQ
RR  RR      EE            QQ  QQ  QQ
RR    RR    EE            QQ    QQ
RR    RR    EE            QQ    QQ
RR      RR  EEEEEEEEEE      QQQQ  QQ
RR      RR  EEEEEEEEEE      QQQQ  QQ
```

```
!
! REQUIRE file for COPY utility, COPY.REQ
!
! Version:      'V04-000'
!
!****************************************************************************
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!****************************************************************************
!
! Created by Carol Peters, April 14, 1978, 14:23:00
!
! Modified by
!
!       V03-005 TSK0004         Tamar Krichevsky        6-Mar-1984
!               Add FIRST_WILD_INFILE bit to qualifier structure.  This bit
!               indcates that the current input file is the first one found
!               for a wildcard specification.
!
!       V03-004 TSK0003         Tamar Krichevsky        9-Feb-1984
!               Change severity of the the BADVALUE message from error to
!               severe.
!
!       V03-003 LMP0150         L. Mark Pilant,         9-Sep-1983  9:46
!               Correct alignment of the protection fields.
!
!       V3-002  TSK0002         Tamar Krichevsky        12-Aug-1983
!               Fix /PROTECTION qualifier so that unspecified fields will be
!               undisturbed.
!
!       V3-001  TSK0001         Tamar Krichevsky        17-Jan-1983
!               Convert bit locations to field defintions for the global
!               variables.  COPY$CLI_STATUS and COPY$SEM_STATUS are now BBLOCKS,
!               instead of BITVECTORS.  Many of the field names have been changed.
!               Others, specifically those for COPY$SEM_STATUS, have remained.
!
!               Remove the external declarations from this module and place
!               them in the modules which need them.
```

```
!               Remove the call_cli, explicit_qual, explicit_cop_qual macros.
!               They are unnecessary with the new CLI interface.
!
!       V203    KRM0037         Karl Malik      12-Jan-1982
!       add CREATEDSTM message.
!
!       V202    WMC0031         Wayne Cardoza   22-Dec-1981
!       Add ILLDIRCOPY message.
!
!       V201    KRM0006         K. Malik        11-Feb-1981
!       Add MSG$_DIRNOTCRE for use when unable to create
!       a network directory.
!
!       V104    TMH0004         T. Halvorsen    17-Nov-1979
!       Change LIBRARY VMSMAC.L32 to REQUIRE VMSMAC.REQ.
!
!       V103    TMH0003         T. Halvorsen    16-Aug-1979
!       Remove fixed_overhead and move to copymain where calculation
!       is more relevant.  Also, changed cbt message to warning.
!
!       V102    TMH0002         T. Halvorsen    26-Jul-1979
!       Add /VOLUME qualifier for relative volume placement
!       Add msg$_cbt for contiguous best try copy
!       Remove tty_timeout value since no longer used
!
!       V101    TMH0001         T. Halvorsen    14-Jul-1979
!       Increase working set FIXED_OVERHEAD to allow for some mag
!       tape copying which was failing.
!
!
! Include files
!

REQUIRE 'SRC$:VMSMAC.REQ';                      ! General purpose macro definitions

!
! Equated symbols
!

LITERAL
    copy_id             = 103,                  ! COPY facility identifier
    append_id           = 113,                  ! APPEND facility identifier

    yes                 = 1,                    ! Used to set a single status bit on
    no                  = 0,                    ! Used to set a single status bit off
    no_file             = 0,                    ! Invalid file specification routine return code
    true                = 1,                    ! Success code
    false               = 0,                    ! Failure code
    ok                  = 1,                    ! Normal routine return code
    error               = 2,                    ! General error routine return code
    no_more_files       = 3,                    ! End of input routine success return code
    no_wild_open        = 5,                    ! Wildcard file cannot be opened success code

    default_alloc       = 0,                    ! Default output allocation size if input size is unknown
    default_protect     = -1,                   ! Special RMS default protection indicator
```

```
    max_name_size       = nam$c_maxrss,             ! Maximum length of a file specification
    page_size           = 512,                      ! Size of a VAX page (bytes)
    disk_block_size     = 512,                      ! Size of a disk block (bytes)
    max_io_length       = 65535,                    ! Maximum length of an I/O request
    single_buffer       = 1,                        ! Level of I/O buffering
    double_buffer       = 2                         ! Level of I/O buffering
    ;

!
! External literals for command line parsing.
!

EXTERNAL LITERAL
    CLI$_PRESENT,                                   ! Entity is present on the command line
    CLI$_NEGATED,                                   ! Entity has been explicity negated
    CLI$_LOCPRES,                                   ! Entity is locally present
    CLI$_LOCNEG                                     ! Entity has been locally negated
    ;

!
! The message codes for COPY and APPEND.
!
    $shr_messages (msg, 0,
                   (appendedb, success),            ! "<file-name> appended to <file-name> (<nn> blocks)"
                   (appendedr, success ),           ! "<file-name> appended to <file-name> (<nn> records)"
                   (atpc, error),                   ! "at PC=<location>"
                   (baddelim, error),               ! "invalid delimiter"
                   (badkey, error),                 ! "invalid keyword"
                   (badlogic, severe),              ! "internal logic error detected"
                   (badlogicpc, severe),            ! "internal logic error detected at PC=<PC>"
                   (badvalue, severe),              ! "invalid keyword value"
                   (clicb, error),                  ! "CLI control block at <address>"
                   (closein, error),                ! "Error closing <file-name> as input"
                   (closeout, error),               ! "Error closing <file-name> as output"
                   (copiedb, success),              ! "<file-name> copied to <file-name> (<nn> blocks)"
                   (copiedr, success),              ! "<file-name> copied to <file-name> (<nn> records)"
                   (created, info),                 ! "<file-name> created"
                   (dirnotcre,warning),             ! "<file-name> directory file not created"
                   (hashconcat, error),             ! "Hashed file cannot be concatenated"
                   (highver, warning),              ! "higher version of <file-name> already exists"
                   (idxconcat, error),              ! "Indexed file cannot be concatenated"
                   (incompat, warning),             ! "<file-name> and <file-name> have incompatible attr"
                   (invquaval, severe),             ! "invalid value <value> for qualifier/<qualiifer>"
                   (newfiles, success),             ! "<number> files created"
                   (notcopied, warning),            ! "<file-name> not copied"
                   (notcmplt, warning),             ! "<file-name> not completely copied"
                   (novalue, error),                ! "keyword requires a value"
                   (openin, error),                 ! "Error opening <file-name> as input"
                   (openout, error),                ! "Error opening <file-name> as output"
                   (overlay, info),                 ! "<file-name> being overwritten"
                   (readerr, error),                ! "Error reading <file-name>"
                   (relconcat, error),              ! "Relative file cannot be concatenated"
                   (replaced, info),                ! "<file-name> being replaced"
                   (syntax, severe),                ! "syntax error"
                   (wildconcat, error),             ! "Wildcard specification cannot be concatenated"
                   (writeerr, error),               ! "Error writing <file-name>"
```

```
                    (cbt, warning),                 ! "File copied contiguous best try"
                    (illdircopy, warning),          ! "illegal director copy of <file-name> attempted"
                    (createdstm, info));            ! "<file-name> has been created in stream format"

!
! Two SEVERE error message codes.
!
LITERAL
    msg$_openinx = msg$_openin -                    ! "Error opening <file-name> as input"
                        sts$k_error + sts$k_severe,
    msg$_openoutx = msg$_openout -                  ! "Error opening <file-name> as output"
                        sts$k_error + sts$k_severe;

!
! A COPY specific message code:
!
    $shr_messages (cpy, copy_id,
                    (wildoutver, error));           ! "Explicit wildcard version required for new file'

LITERAL

    !++
    !
    ! Bit offsets for flags in COPY$SEM_STATUS.  Note that the first 16 bits
    ! are checked by COPY$SEMANTICS to determine the characteristics of the
    ! output file specification.  Only 10 of these bits are currently in use.
    ! The flags which describe the state of the input and output files begin
    ! at the 16th bit.
    !
    !--

    concat_qual_bit      = 0,                       ! /CONCATENATE was explicitly given
    exp_inp_ver_bit      = 1,                       ! Explicit input version number specified
    exp_out_ver_bit      = 2,                       ! Explicit output version number specified
    no_output_spec_bit   = 3,                       ! No output file name, type or version specified
    wild_input_bit       = 4,                       ! Wildcard in input specification
    wild_inp_ver_bit     = 5,                       ! Input version number is wild
    wild_output_bit      = 6,                       ! Wildcard in output specification
    wild_out_ver_bit     = 7,                       ! Output version number is wild
    multiple_output_bit  = 8,                       ! Multiple output files being produced
    multiple_input_bit   = 9,                       ! Multiple input files specified

    quiet_slip_bit       = 16,                      ! Slip lower version numbers without reporting them
    outfile_open_bit     = 17,                      ! Output file is currently open
    infile_open_bit      = 18,                      ! In put file is currently open
    concat_follows_bit   = 19,                      ! Input files will be concatenated
    concat_active_bit    = 20,                      ! Input files are being concatented to an output file
    wildcard_active_bit  = 21,                      ! Input file spec contained a wildcard
    record_mode_bit      = 22,                      ! Record mode I/O required
    extend_outfile_bit   = 23,                      ! Append input file to current output file
    no_expl_out_fields_bit = 24,                    ! Output file spec fields all contained wild cards or were missing
    first_wild_infile_bit  = 25                     ! Curr. file is first to match wildcard spec
    ;

!
! Macros
```

```
!
MACRO
    !++
    !
    ! Field definitions for COPY$SEM_STATUS, which describes the conditions
    ! that effect the creation of the output file ( for example, an explicit
    ! version number was given for the output file ) and the current status of
    ! the output file.  (Is it open? Are there multiple output files? etc.)
    !
    !--

    concat_qual         = COPY$SEM_STATUS[ 0, concat_qual_bit,    1, 0]%,
    exp_inp_ver         = COPY$SEM_STATUS[ 0, exp_inp_ver_bit,    1, 0]%,
    exp_out_ver         = COPY$SEM_STATUS[ 0, exp_out_ver_bit,    1, 0]%,
    no_output_spec      = COPY$SEM_STATUS[ 0, no_output_spec_bit, 1, 0]%,
    wild_input          = COPY$SEM_STATUS[ 0, wild_input_bit,     1, 0]%,
    wild_inp_ver        = COPY$SEM_STATUS[ 0, wild_inp_ver_bit,   1, 0]%,
    wild_output         = COPY$SEM_STATUS[ 0, wild_output_bit,    1, 0]%,
    wild_out_ver        = COPY$SEM_STATUS[ 0, wild_out_ver_bit,   1, 0]%,
    multiple_output     = COPY$SEM_STATUS[ 0, multiple_output_bit,1, 0]%,
    multiple_input      = COPY$SEM_STATUS[ 0, multiple_input_bit, 1, 0]%,
    quiet_slip          = COPY$SEM_STATUS[ 0, quiet_slip_bit,     1, 0]%,
    outfile_open        = COPY$SEM_STATUS[ 0, outfile_open_bit,   1, 0]%,
    infile_open         = COPY$SEM_STATUS[ 0, infile_open_bit,    1, 0]%,
    concat_follows      = COPY$SEM_STATUS[ 0, concat_follows_bit, 1, 0]%,
    concat_active       = COPY$SEM_STATUS[ 0, concat_active_bit,  1, 0]%,
    wildcard_active     = COPY$SEM_STATUS[ 0, wildcard_active_bit,1, 0]%,
    record_mode         = COPY$SEM_STATUS[ 0, record_mode_bit,    1, 0]%,
    extend_outfile      = COPY$SEM_STATUS[ 0, extend_outfile_bit, 1, 0]%,
    no_expl_out_fields  = COPY$SEM_STATUS[ 0, no_expl_out_fields_bit, 1, 0]%,
    first_wild_infile   = COPY$SEM_STATUS[ 0, first_wild_infile_bit, 1, 0]%
    ;

MACRO

    !++
    !
    ! Field definitions for COPY$CLI_STATUS, the block which contains the
    ! results of the command line parse.  If a bit is set, then the qualifier
    ! was given on the command line.
    !
    ! Because the command lines should produce identical results:
    !   COPY/QUAL a,b/NOQUAL,c *    <-->   COPY a,b/NOQUAL,c */QUAL
    ! COPY has to pretend that all qualifiers on the output file are global
    ! instead of positional.  This means that extra information about
    ! the command line needs to be kept around.  So, for each positional
    ! qualifier (those qualifiers which effect the output file in some
    ! way) there are three bits in COPY$CLI_STATUS... one for the global
    ! presence of the qualifier, one for the local presence and the third
    ! for local negations of the qualifier.  The longwords which contain
    ! values given on the command line hold only the global values.  The
    ! local values are stored elsewhere.
    !
    !**************************************************************************
```

```
!
! COPY$CLI_STATUS has the following format:
!
!   32      16 15       0   Byte offset:
!
!   ┌─────────┬─────────┐    0 - Global qualifier flags; 2 - Positional qualifier flags
!   ├─────────┼─────────┤    4 - Positional qualifier flags
!   ├─────────┼─────────┤    8 - /ALLOCATION value (global)
!   ├─────────┼─────────┤   12 - /EXTENSION value (global)
!   ├─────────┼─────────┤   16 - /FILE_MAXIMUM value (global)
!   ├─────────┼─────────┤   20 - /PROTECTION mask (global)
!   ├─────────┼─────────┤   24 - /VOLUME value (global)
!
!*****************************************************************************
!
!--

append_command       = COPY$CLI_STATUS[  0,  0, 1, 0]%,      ! APPEND command
log_msg_qual         = COPY$CLI_STATUS[  0,  1, 1, 0]%,      ! /LOG
explicit_concat_qual= COPY$CLI_STATUS[  0,  2, 1, 0]%,      ! /CONCATENATE
negated_concat_qual = COPY$CLI_STATUS[  0,  3, 1, 0]%,      ! /NOCONCATENATE
new_version_qual     = COPY$CLI_STATUS[  0,  4, 1, 0]%,      ! /NEW_VERSION

alloc_qual           = COPY$CLI_STATUS[  2,  0, 1, 0]%,      ! /ALLOCATION
loc_alloc_qual       = COPY$CLI_STATUS[  2,  1, 1, 0]%,      ! /ALLOCATION (locally)
neg_alloc_qual       = COPY$CLI_STATUS[  2,  2, 1, 0]%,      ! /ALLOCATION (locally negated)

contig_qual          = COPY$CLI_STATUS[  2,  3, 1, 0]%,      ! /CONTIGUOUS
contig_negated       = COPY$CLI_STATUS[  2,  4, 1, 0]%,      ! /NOCONTIGUOUS
loc_contig_qual      = COPY$CLI_STATUS[  2,  5, 1, 0]%,      ! /CONTIGUOUS (locally)
neg_contig_qual      = COPY$CLI_STATUS[  2,  6, 1, 0]%,      ! /CONTIGUOUS (locally negated)

extend_qual          = COPY$CLI_STATUS[  2,  7, 1, 0]%,      ! /EXTENSION
loc_extend_qual      = COPY$CLI_STATUS[  2,  8, 1, 0]%,      ! /EXTENSION (locally)
neg_extend_qual      = COPY$CLI_STATUS[  2,  9, 1, 0]%,      ! /EXTENSION (locally negated)

file_max_qual        = COPY$CLI_STATUS[  2, 10, 1, 0]%,      ! /FILE_MAXIMUM
loc_file_max_qual    = COPY$CLI_STATUS[  2, 11, 1, 0]%,      ! /FILE_MAXIMUM (locally)
neg_file_max_qual    = COPY$CLI_STATUS[  2, 12, 1, 0]%,      ! /FILE_MAXIMUM (locally negated)

protect_qual         = COPY$CLI_STATUS[  2, 13, 1, 0]%,      ! /PROTECTION
loc_protect_qual     = COPY$CLI_STATUS[  2, 14, 1, 0]%,      ! /PROTECTION (locally)
neg_protect_qual     = COPY$CLI_STATUS[  2, 15, 1, 0]%,      ! /PROTECTION (locally negated)

read_chk_qual        = COPY$CLI_STATUS[  4,  0, 1, 0]%,      ! /READ_CHECK
loc_read_chk_qual    = COPY$CLI_STATUS[  4,  1, 1, 0]%,      ! /READ_CHECK (locally)
neg_read_chk_qual    = COPY$CLI_STATUS[  4,  2, 1, 0]%,      ! /READ_CHECK (locally negated)

write_chk_qual       = COPY$CLI_STATUS[  4,  3, 1, 0]%,      ! /WRITE_CHECK
write_chk_negated    = COPY$CLI_STATUS[  4,  4, 1, 0]%,      ! /NOWRITE_CHECK
loc_write_chk_qual   = COPY$CLI_STATUS[  4,  5, 1, 0]%,      ! /WRTIE_CHECK (locally)
neg_write_chk_qual   = COPY$CLI_STATUS[  4,  6, 1, 0]%,      ! /WRITE_CHECK (locally negated)

overlay_qual         = COPY$CLI_STATUS[  4,  7, 1, 0]%,      ! /OVERLAY
loc_overlay_qual     = COPY$CLI_STATUS[  4,  8, 1, 0]%,      ! /OVERLAY (locally)
neg_overlay_qual     = COPY$CLI_STATUS[  4,  9, 1, 0]%,      ! /OVERLAY (locally negated)
```

```
    volume_qual         = COPY$CLI_STATUS[  4, 10, 1, 0]%,      ! /VOLUME
    loc_volume_qual     = COPY$CLI_STATUS[  4, 11, 1, 0]%,      ! /VOLUME (locally)
    neg_volume_qual     = COPY$CLI_STATUS[  4, 12, 1, 0]%,      ! /VOLUME (locally negated)

    truncate_qual       = COPY$CLI_STATUS[  4, 13, 1, 0]%,      ! /TRUNCATE
    truncate_negated    = COPY$CLI_STATUS[  4, 14, 1, 0]%,      ! /NOTRUNCATE
    loc_truncate_qual   = COPY$CLI_STATUS[  4, 15, 1, 0]%,      ! /TRUNCATE (locally)
    neg_truncate_qual   = COPY$CLI_STATUS[  4, 16, 1, 0]%,      ! /TRUNCATE (locally negated)

    replace_qual        = COPY$CLI_STATUS[  4, 17, 1, 0]%,      ! /REPLACE
    loc_replace_qual    = COPY$CLI_STATUS[  4, 18, 1, 0]%,      ! /REPLACE (locally)
    neg_replace_qual    = COPY$CLI_STATUS[  4, 19, 1, 0]%,      ! /REPLACE (locally negated)

    allocation_value    = COPY$CLI_STATUS[  8,  0, 32,0]%,      ! /ALLOCATION value
    extension_value     = COPY$CLI_STATUS[ 12,  0, 32,0]%,      ! /EXTENSION value
    file_max_value      = COPY$CLI_STATUS[ 16,  0, 32,0]%,      ! /FILE_MAXIMUM value
    protection_or       = COPY$CLI_STATUS[ 20,  0, 16,0]%,      ! /PROTECTION mask
    protection_and      = COPY$CLI_STATUS[ 22,  0, 16,0]%,      ! /PROTECTION mask
    volume_value        = COPY$CLI_STATUS[ 24,  0, 32,0]%       ! /VOLUME value
    ;

!
! End of REQUIRE file, COPY.REQ
!
```

COPYMSG
REQ

COPYSPECS
LIS

COPY

COPY
MAP

VMSMAC
REQ

COPY
REQ

COPYCLI
LIS

COPYMAIN
LIS

COPYSEMAN
LIS