```
                                        M  1
```

```
BBBBBBBBBBBB        AAAAAAAAA        SSSSSSSSSSSS  RRRRRRRRRRR      TTTTTTTTTTTTTTT  LLL
BBBBBBBBBBBB        AAAAAAAAA        SSSSSSSSSSSS  RRRRRRRRRRR      TTTTTTTTTTTTTTT  LLL
BBBBBBBBBBBB        AAAAAAAAA        SSSSSSSSSSSS  RRRRRRRRRRR      TTTTTTTTTTTTTTT  LLL
BBB         BBB  AAA         AAA  SSS              RRR         RRR        TTT        LLL
BBB         BBB  AAA         AAA  SSS              RRR         RRR        TTT        LLL
BBB         BBB  AAA         AAA  SSS              RRR         RRR        TTT        LLL
BBB         BBB  AAA         AAA  SSS              RRR         RRR        TTT        LLL
BBB         BBB  AAA         AAA  SSS              RRR         RRR        TTT        LLL
BBB         BBB  AAA         AAA  SSS              RRR         RRR        TTT        LLL
BBBBBBBBBBBB     AAA         AAA     SSSSSSSSS     RRRRRRRRRRR            TTT        LLL
BBBBBBBBBBBB     AAA         AAA     SSSSSSSSS     RRRRRRRRRRR            TTT        LLL
BBBBBBBBBBBB     AAA         AAA     SSSSSSSSS     RRRRRRRRRRR            TTT        LLL
BBB         BBB  AAAAAAAAAAAAAAA              SSS  RRR   RRR              TTT        LLL
BBB         BBB  AAAAAAAAAAAAAAA              SSS  RRR   RRR              TTT        LLL
BBB         BBB  AAAAAAAAAAAAAAA              SSS  RRR   RRR              TTT        LLL
BBB         BBB  AAA         AAA              SSS  RRR      RRR           TTT        LLL
BBB         BBB  AAA         AAA              SSS  RRR      RRR           TTT        LLL
BBB         BBB  AAA         AAA              SSS  RRR      RRR           TTT        LLL
BBBBBBBBBBBB     AAA         AAA  SSSSSSSSSSSS     RRR         RRR        TTT        LLLLLLLLLLLLLLL
BBBBBBBBBBBB     AAA         AAA  SSSSSSSSSSSS     RRR         RRR        TTT        LLLLLLLLLLLLLLL
BBBBBBBBBBBB     AAA         AAA  SSSSSSSSSSSS     RRR         RRR        TTT        LLLLLLLLLLLLLLL
```

FILEID**BASMAGTAP

```
BBBBBBBB      AAAAAA      SSSSSSSS  MM      MM    AAAAAA      GGGGGGGG  TTTTTTTTTT    AAAAAA    PPPPPPPP
BBBBBBBB      AAAAAA      SSSSSSSS  MM      MM    AAAAAA      GGGGGGGG  TTTTTTTTTT    AAAAAA    PPPPPPPP
BB      BB  AA      AA  SS          MMMM  MMMM  AA      AA  GG              TT      AA      AA  PP      PP
BB      BB  AA      AA  SS          MMMM  MMMM  AA      AA  GG              TT      AA      AA  PP      PP
BB      BB  AA      AA  SS          MM  MM  MM  AA      AA  GG              TT      AA      AA  PP      PP
BB      BB  AA      AA  SS          MM  MM  MM  AA      AA  GG              TT      AA      AA  PP      PP
BBBBBBBB    AA      AA    SSSSSS    MM      MM  AA      AA  GG              TT      AA      AA  PPPPPPPP
BBBBBBBB    AA      AA    SSSSSS    MM      MM  AA      AA  GG              TT      AA      AA  PPPPPPPP
BB      BB  AAAAAAAAAA          SS  MM      MM  AAAAAAAAAA  GG  GGGGGG      TT      AAAAAAAAAA  PP
BB      BB  AAAAAAAAAA          SS  MM      MM  AAAAAAAAAA  GG  GGGGGG      TT      AAAAAAAAAA  PP
BB      BB  AA      AA          SS  MM      MM  AA      AA  GG      GG      TT      AA      AA  PP              ....
BB      BB  AA      AA          SS  MM      MM  AA      AA  GG      GG      TT      AA      AA  PP              ....
BBBBBBBB    AA      AA  SSSSSSSS    MM      MM  AA      AA    GGGGGG        TT      AA      AA  PP              ....
BBBBBBBB    AA      AA  SSSSSSSS    MM      MM  AA      AA    GGGGGG        TT      AA      AA  PP              ....

LL            IIIIII      SSSSSSSS
LL            IIIIII      SSSSSSSS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II        SSSSSS
LL              II        SSSSSS
LL              II              SS
LL              II              SS
LL              II              SS
LL              II              SS
LLLLLLLLLL    IIIIII    SSSSSSSS
LLLLLLLLLL    IIIIII    SSSSSSSS
```

```
0 MODULE BAS$MAGTAPE (                                       !
0                   IDENT = '1-003'                          ! File: BASMAGTAP.B32
0                   ) =
1 BEGIN
1 !
1 !****************************************************************************
1 !*                                                                          *
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1 !*                                                                          *
1 !*                                                                          *
1 !****************************************************************************
1 !
1
1 !++
1 ! FACILITY:  BASIC-PLUS-2 Miscellaneous I/O
1 !
1 ! ABSTRACT:
1 !
1 !       This module contains the BASIC MAGTAPE function,
1 !       Which manipulates non file-structured mag tape files.
1 !
1 ! ENVIRONMENT:  VAX-11 User Mode
1 !
1 ! AUTHOR: John Sauter, CREATION DATE: 20-APR-1979
1 !
1 ! MODIFIED BY:
1 !
1 ! 1-001 - Original.
1 ! 1-002 - Add a call to BAS$$CB_POP.  JBS 10-JUL-1979
1 ! 1-003 - Set up ISB$A_USER_FP.  JBS 25-JUL-1979
1 !--
1
1 !<BLF/PAGE>
```

```
;   51      0050  1 !
;   52      0051  1 ! SWITCHES:
;   53      0052  1 !
;   54      0053  1
;   55      0054  1 SWITCHES ADDRESSING_MODE (EXTERNAL = GENERAL, NONEXTERNAL = WORD_RELATIVE);
;   56      0055  1
;   57      0056  1 !
;   58      0057  1 ! LINKAGES:
;   59      0058  1 !
;   60      0059  1
;   61      0060  1 REQUIRE 'RTLIN:OTSLNK';                        ! Define linkages
;   62      0489  1
;   63      0490  1 !
;   64      0491  1 ! TABLE OF CONTENTS:
;   65      0492  1 !
;   66      0493  1
;   67      0494  1 FORWARD ROUTINE
;   68      0495  1     BAS$MAGTAPE;                               ! Manipulate a mag tape file
;   69      0496  1
;   70      0497  1 !
;   71      0498  1 ! INCLUDE FILES:
;   72      0499  1 !
;   73      0500  1
;   74      0501  1 REQUIRE 'RTLML:OTSLUB';                        ! Get LUB definitions
;   75      0641  1
;   76      0642  1 REQUIRE 'RTLML:OTSISB';                        ! Get ISB definitions
;   77      0810  1
;   78      0811  1 REQUIRE 'RTLIN:BASIOERR';                      ! I/O error codes
;   79      0864  1
;   80      0865  1 REQUIRE 'RTLIN:RTLPSECT';                      ! Macros for defining psects
;   81      0960  1
;   82      0961  1 LIBRARY 'RTLSTARLE';                           ! System symbols
;   83      0962  1
;   84      0963  1 !
;   85      0964  1 ! MACROS:
;   86      0965  1 !
;   87      0966  1 !       NONE
;   88      0967  1 !
;   89      0968  1 ! EQUATED SYMBOLS:
;   90      0969  1 !
;   91      0970  1
;   92      0971  1 LITERAL
;   93      0972  1     BAS$K_REWOFL = 1,                          ! Rewind and go off-line
;   94      0973  1     BAS$K_WEOF = 2,                            ! Write EOF
;   95      0974  1     BAS$K_REWIND = 3,                          ! Rewind
;   96      0975  1     BAS$K_SKIPREC = 4,                         ! Skip record
;   97      0976  1     BAS$K_BACKREC = 5,                         ! Backspace record
;   98      0977  1     BAS$K_SETDENPAR = 6,                       ! Set density and parity
;   99      0978  1     BAS$K_STATUS = 7,                          ! Tape status
;  100      0979  1     BAS$K_FILECHAR = 8,                        ! File characteristics
;  101      0980  1     BAS$K_REWCLOSE = 9;                        ! Rewind on CLOSE
;  102      0981  1
;  103      0982  1 !
;  104      0983  1 ! PSECTS:
;  105      0984  1 !
;  106      0985  1 DECLARE_PSECTS (BAS);                          ! Declare psects for BAS$ facility
;  107      0986  1 !
```

```
1 ! OWN STORAGE:
1 !
1 !       NONE
1 !
1 ! EXTERNAL REFERENCES:
1 !
1
1 EXTERNAL ROUTINE
1     BAS$$CB_PUSH : JSB_CB_PUSH NOVALUE,          ! Load register CCB
1     BAS$$CB_POP : JSB_CB_POP NOVALUE,            ! Done with register CCB
1     BAS$$STOP : NOVALUE,                         ! Signal fatal error
1     BAS$$STOP_IO : NOVALUE;                      ! Signal fatal I/O error
1
1 !+
1 ! The following are the error codes used in this module.
1 !-
1
1 EXTERNAL LITERAL
1     BAS$K_IO_CHANOT : UNSIGNED (8),              ! Channel not open.
1     BAS$K_ILLMAGUSA : UNSIGNED (8);              ! Illegal MAGTAPE() Usage
1
```

```
GLOBAL ROUTINE BAS$MAGTAPE (                            ! Do a MAGTAPE function
        FUNCTION,                                       ! Function code, 1 to 9
        PARAM,                                          ! Additional parameter
        CHAN                                            ! Channel
    ) =

!++
! FUNCTIONAL DESCRIPTION:
!
!       Manipulate a non-file structured mag tape.  Nine functions
!       are defined, coded as follows:
!
!       CODE    MEANING
!       ----    -------
!
!       1       Rewind and go offline
!
!       2       Write and end-of-file (EOF) mark.
!
!       3       Rewind
!
!       4       Skip record.  The additional argument is the number
!               of records to skip.  The value returned is the number
!               of records not skipped.
!
!       5       Backspace record.  The additional argument is the
!               number of records to backspace.  The value returned
!               is the number of records not backspaced.
!
!       6       Set density and parity.  The additional argument encodes
!               the desired density and parity, see below.
!
!       7       Return magtape status.  The value returned is the
!               status.
!
!       8       Return file characteristics.  The value returned is
!               the file characteristics.
!
!       9       Rewind on close.  When the next CLOSE is done on this
!               channel, the tape will be rewound.
!
! FORMAL PARAMETERS:
!
!       FUNCTION.rl.v   The function to perform, see above.
!       PARAM.rl.v      An additional parameter to some functions,
!                       see above.
!       CHAN.rl.v       The channel to do this function to.
!
! IMPLICIT INPUTS:
!
!       NONE
!
! IMPLICIT OUTPUTS:
!
!       NONE
!
! ROUTINE VALUE:
```

```
1 ! COMPLETION CODES:
1 !
1 !       Depends on the function, see above.  Where the result is not
1 !       specified, 0 is returned.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals if an error is encountered.
1 !       BAS$$CB_PUSH will signal if the channel number is invalid.
1 !       We signal BAS$K_IO_CHANOT if the channel is not open.
1 !
1 !--
1
2    BEGIN
2
2    BUILTIN
2        FP;
2
2    GLOBAL REGISTER
2        CCB = K_CCB_REG : REF BLOCK [, BYTE];
2
2    LOCAL
2        FMP : REF BLOCK [, BYTE],
2        RESULT;
2
2    FMP = .FP;
2 !+
2 ! Note: this function is provided as a transition aid from BASIC-PLUS.
2 ! It is not intended to be used for new development in BASIC-PLUS-2.
2 ! Therefore, it has been organized as a separate, self-contained
2 ! module, which can be omitted in situations where BASIC-PLUS
2 ! compatability is not a goal.
2 !-
2 !+
2 ! Load register CCB from the channel specified.  It had better be
2 ! open.  Channel 0 is not permitted.
2 !-
2
2    IF (.CHAN EQL 0) THEN BAS$$STOP (BAS$K_ILLMAGUSA);
2
2    BAS$$CB_PUSH (.CHAN, LUB$K_LUN_MIN);
2    CCB [ISB$A_USER_FP] = .FMP [SF$L_SAVE_FP];
2
2    IF ( NOT .CCB [LUB$V_OPENED]) THEN BAS$$STOP_IO (BAS$K_IO_CHANOT);
2
2 !+
2 ! If no result is specified below, return zero.
2 !-
2    RESULT = 0;
2 !+
2 ! Dispatch on the function code.
2 !-
2
2    CASE .FUNCTION FROM BAS$K_REWOFL TO BAS$K_REWCLOSE OF
2        SET
2
2        [BAS$K_REWOFL] :
```

```
2 !+
2 ! This function is not implemented.  In VMS, unloading a mag tape
2 ! is the responsibility of the command language interpreter, using
2 ! the DISMOUNT command.
2 !-
2          BAS$$STOP_IO (BAS$K_ILLMAGUSA);
2
2       [BAS$K_WEOF] :
2 !+
2 ! This function is not implemented.  To get its effect, CLOSE and
2 ! then OPEN the channel.  Be sure to specify that no rewinding is
2 ! to be done when you OPEN it.
2 !-
2          BAS$$STOP_IO (BAS$K_ILLMAGUSA);
2
2       [BAS$K_REWIND] :
2 !+
2 ! This function repositions the file to its first record.  It can
2 ! be used on any file (except unit record and terminal), not just
2 ! mag tape.
2 !-
3          BEGIN
3
3          LOCAL
3             REWIND_STATUS;
3
3          REWIND_STATUS = $REWIND (RAB = .CCB);
3
4          IF ( NOT .REWIND_STATUS)
3          THEN
4             BEGIN
4
4             WHILE (.CCB [RAB$L_STS] EQL RMS$_RSA) DO
5                BEGIN
5                $WAIT (RAB = .CCB);
5                $REWIND (RAB = .CCB);
4                END;
4
4             IF (.CCB [RAB$L_STS] NEQ RMS$_BOF) THEN BAS$$STOP_IO (BAS$K_IOERR_REC);
4
3             END;
3
2          END;
2
2       [BAS$K_SKIPREC] :
2 !+
2 ! This function is not implemented.  To get its effect, issue
2 ! GETs and ignore the data transfered.
2 !-
2          BAS$$STOP_IO (BAS$K_ILLMAGUSA);
2
2       [BAS$K_BACKREC] :
2 !+
2 ! This function is not implemented.  To get its effect, issue the
2 ! REWIND function and then skip forward until reaching the desired
2 ! record.
2 !-
```

```
;     2                 BAS$$STOP_IO (BAS$K_ILLMAGUSA);
;     2
;     2             [BAS$K_SETDENPAR] :
;     2 !+
;     2 ! This function is not implemented.  The responsibility for setting
;     2 ! density and parity in VMS belongs to the command language, which
;     2 ! provides the MOUNT command for this purpose.
;     2 !-
;     2                 BAS$$STOP_IO (BAS$K_ILLMAGUSA);
;     2
;     2             [BAS$K_STATUS] :
;     2 !+
;     2 ! This function is not implemented, since the SET function is not.
;     2 !-
;     2                 BAS$$STOP_IO (BAS$K_ILLMAGUSA);
;     2
;     2             [BAS$K_FILECHAR] :
;     2 !+
;     2 ! This function is not implemented, since the FSP$ function effectively
;     2 ! replaces it, and, in the absence of most of the other functions
;     2 ! it is not very useful.
;     2 !-
;     2                 BAS$$STOP_IO (BAS$K_ILLMAGUSA);
;     2
;     2             [BAS$K_REWCLOSE] :
;     2 !+
;     2 ! This function is not implemented.  To get its effect, after
;     2 ! CLOSEing the channel, OPEN it again for input, do a REWIND, and CLOSE
;     2 ! it.  Better, make use of the OPEN options to get this effect.
;     2 !-
;     2                 BAS$$STOP_IO (BAS$K_ILLMAGUSA);
;     2             TES;
;     2
;     2 !+
;     2 ! We are done with register CCB
;     2 !-
;     2         BAS$$CB_POP ();
;     2 !+
;     2 ! We have stored in RESULT any non-zero value to be returned.
;     2 !-
;     2         RETURN (.RESULT);
;     1         END;                                    ! of routine BAS$MAGTAPE


                                                        .TITLE  BAS$MAGTAPE
                                                        .IDENT  \1-003\

                                                        .EXTRN  BAS$$CB_PUSH, BAS$$CB_POP
                                                        .EXTRN  BAS$$STOP, BAS$$STOP_IO
                                                        .EXTRN  BAS$K_IO_CHANOT
                                                        .EXTRN  BAS$K_ILLMAGUSA
                                                        .EXTRN  SYS$REWIND, SYS$WAIT

                                                        .PSECT  _BAS$CODE,NOWRT,  SHR,  PIC,2

                                  083C 00000            .ENTRY  BAS$MAGTAPE, Save R2,R3,R4,R5,R11          ; 1008
                  55 00000000G  00  9E 00002            MOVAB   SYS$REWIND, R5                             ;
```

```
                                           54 00000000G   00  9E 00009          MOVAB    BAS$$STOP_IO, R4                                ;
                                           53             5D  D0 00010          MOVL     FP, FMP                                         ; 1090
                                                     0C   AC  D5 00013          TSTL     CHAN                                            ; 1103
                                                          0B  12 00016          BNEQ     1$                                              ;
                                           7E        00G  8F  9A 00018          MOVZBL   #BAS$K_ILLMAGUSA, -(SP)                         ;
                               00000000G   00             01  FB 0001C          CALLS    #1, BAS$$STOP                                   ;
                                                          50  D4 00023 1$:      CLRL     R0                                              ; 1105
                                           52        0C   AC  D0 00025          MOVL     CHAN, R2                                        ;
                                              00000000G   00  16 00029          JSB      BAS$$CB_PUSH                                    ;
                                   FF4C    CB        0C   A3  D0 0002F          MOVL     12(FMP), -180(CCB)                              ; 1106
                                           07        FC   AB  E8 00035          BLBS     -4(CCB), 2$                                     ; 1108
                                           7E        00G  8F  9A 00039          MOVZBL   #BAS$K_IO_CHANOT, -(SP)                         ;
                                           64             01  FB 0003D          CALLS    #1, BAS$$STOP_IO                                ;
                                                          52  D4 00040 2$:      CLRL     RESULT                                          ; 1113
                           08              01        04   AC  CF 00042          CASEL    FUNCTION, #1, #8                                ; 1118
          0045           0014            0045           0045     00047 3$:      .WORD    7$-3$,-                                         ;
          0045           0045            0045           0045     0004F                   7$-3$,-                                         ;
                                                        0045     00057                   4$-3$,-                                         ;
                                                                                         7$-3$,-                                         ;
                                                                                         7$-3$,-                                         ;
                                                                                         7$-3$,-                                         ;
                                                                                         7$-3$,-                                         ;
                                                                                         7$-3$,-                                         ;
                                                                                         7$-3$                                           ;
                                                          31  11 00059          BRB      7$                                              ; 1135
                                                          5B  DD 0005B 4$:      PUSHL    CCB                                             ; 1148
                                           65             01  FB 0005D          CALLS    #1, SYS$REWIND                                  ;
                                           30             50  E8 00060          BLBS     REWIND_STATUS, 9$                               ; 1150
                               000182DA    8F        08   AB  D1 00063 5$:      CMPL     8(CCB), #99034                                  ; 1154
                                                          10  12 0006B          BNEQ     6$                                              ;
                                                          5B  DD 0006D          PUSHL    CCB                                             ; 1156
                               00000000G   00             01  FB 0006F          CALLS    #1, SYS$WAIT                                    ;
                                                          5B  DD 00076          PUSHL    CCB                                             ; 1157
                                           65             01  FB 00078          CALLS    #1, SYS$REWIND                                  ;
                                                          E6  11 0007B          BRB      5$                                              ; 1154
                               00018198    8F        08   AB  D1 0007D 6$:      CMPL     8(CCB), #98712                                  ; 1160
                                                          0C  13 00085          BEQL     9$                                              ;
                                           7E             01  CE 00087          MNEGL    #1, -(SP)                                       ;
                                                          04  11 0008A          BRB      8$                                              ; 1171
                                           7E        00G  8F  9A 0008C 7$:      MOVZBL   #BAS$K_ILLMAGUSA, -(SP)                         ; 1209
                                           64             01  FB 00090 8$:      CALLS    #1, BAS$$STOP_IO                                ;
                                              00000000G   00  16 00093 9$:      JSB      BAS$$CB_POP                                     ; 1215
                                           50             52  D0 00099          MOVL     RESULT, R0                                      ; 1219
                                                              04 0009C          RET                                                      ; 1220

; Routine Size:  157 bytes,    Routine Base:  _BAS$CODE + 0000


;  343          1221   1
;  344          1222   1 END                                                   ! of module BAS$MAGTAPE
;  345          1223   1
;  346          1224   0 ELUDOM
;                                          PSECT SUMMARY
;
;      Name                         Bytes                           Attributes
;
;  _BAS$CODE                             157  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(2)




;                                Library Statistics
;
;                                                  -------- Symbols --------       Pages       Processing
;      File                                        Total    Loaded   Percent       Mapped      Time
;
;  _$255$DUA28:[SYSLIB]STARLET.L32;1                9776         9         0         581          00:01.2





;                                          COMMAND QUALIFIERS

;      BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LIS$:BASMAGTAP/OBJ=OBJ$:BASMAGTAP MSRC$:BASMAGTAP/UPDATE=(ENH$:BASMAGTAP
;      )

; Size:          157 code + 0 data bytes
; Run Time:         00:10.4
; Elapsed Time:     00:22.6
; Lines/CPU Min:     7088
; Lexemes/CPU-Min: 38814
; Memory Used:  144 pages
; Compilation Complete
```

0024 AH-BT13A-SE
VAX/VMS V4.0

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BASIOEND
LIS

BASMATADD
LIS

BASMAGTAP
LIS