PDOS ASSEMBLY PRIMITIVES REFERENCE

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PDOS Assembly Primitives Reference

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INTRODUCTION

This manual is a comprehensive reference to the PDOS assembly primitives. It is intended as a reference guide only, not as an introduction to assembly language programming. Some guidelines are given in this manual, however, for 68000 assembly programming with PDOS.

The PDOS assembly primitives are described separately in alphabetic order and make up the bulk of this manual. Also included in this manual is a list of calls divided by groups and a table of error codes.

Each assembly primitive description lists the value, the module, the syntax, and the registers of that call. It also describes how the call works and gives an example of that call used in an assembly language program. Possible errors, references to related calls, and other notes are also given. Examples are enclosed in a box and appear in a different typeface from the rest of the text. User input is bolded and comments are italicized. Keys are shown as bolded characters; for example, **Ctrl C** indicates that the "C" key is pressed while the "Control" key is being held down. **Esc** indicates the "Escape" key should be pressed. The ↵ symbol indicates a carriage return and the ↓ symbol indicates a line feed.

PDOS assembly primitives are assembly language system calls to PDOS. They consist of one word A-line instructions (words with the first four bits equal to hexadecimal "A"). PDOS calls return results in the 68000 status register as well as regular user registers.

Guidelines For 68000 Assembly Programming

The following guidelines should prove useful to you in assembly programming for the PDOS system:

Standard 68000 Assembly Language. The PDOS assembler supports the standard Motorola 68000 assembly language instruction set as defined in the *M68000 16-/32-bit Microprocessor Programmer's Reference Manual.* This set includes register designations, instruction mnemonics, and addressing syntax. For a complete discussion of the PDOS assembler and its use, refer to the *PDOS Assembler, Linker Reference Manual.*

68000 Register Usage. All 68000 registers are available for user programs. However, as a convention, the following are recommended register usages:

A4 = User variables base register
A5 = SYRAM pointer (initialized by PDOS)
A6 = TCB pointer (initialized by PDOS)
A7 = User stack pointer (EUM$-$100).

The XGML primitive may be used to reinitialize registers A5 and A6.

Position Independent and Re-entrant Coding. PDOS assembly programs should be position independent and re-entrant coded. This means that base registers and PC relative variables should be used in the place of absolute addressing and that the stack or registers should be used for parameter passing.

For example:

Use BSRs instead of JSRs.

Good

```
        BSR.L   SUBRT
```

Not Good

```
        JSR     SUBRT
```

Use (PC) instead of absolute.

```
        LEA.L   LAB(PC),A0
        ...
LAB     EQU     *
```

```
        MOVEA.L #LAB,A0
        ...
LAB     EQU     *
```

Set up OFFSET area.

```
        LEA.L   VARS(PC),A0
        CLR.B   PRT_(A0)
        ...
VARS    EQU     *
        OFFSET  0
PRT_    DS.B    1
```

```
        CLR.B   PRT
        ...
PRT     DC.B    0
```

PDOS Primitives. PDOS assembly primitives are fully supported by the PDOS assembler. These calls to PDOS will assemble to A-line instructions.

XEXT
XSOP

The primitives may also be specified as DC.W constants if you are using assembler other than the PDOS assembler.

```
        DC.W    $A00E   ;XEXT
        DC.W    $A0EC   ;XSOP
```

System Variables. The PDOS assembler supplies most system constants you are likely to require. These constants are supplied on reference after the "OPT PDOS" directive is executed. The following is the standard convention adopted for external PDOS symbols:

xxx$ = TCB index (A6)
xxx. = SYRAM constant
xxxx. = SYRAM index (A5)
.xxx = Global system constant
m.xxx = Module constant
m$xxx = Module entry point
m_xxx = Module index
xxx_ = User index

```
MOVE.B  U1P$(A6),D0
MULU.W  #TBZ.,D0
MOVE.L  TICS.(A5),D1
MOVE.W  #.BPS,D7
MOVE.W  #B.PTMSK,SR
BSR.L   K2$PINT
CLR.W   B_TPS(A0)
ADDA.L  AVL_(A4),A0
```

The following illustrates how some of these constants might be used:

```
BSET.B      #~118,118/8+EVTB.(A5)  Set event 118
MOVEA.L     MAIL.(A5),A0           Point to the MAIL array
MOVE.L      TICS.(A5),D1           Read system tics
ST.B        DFLG.(A5)              Set hard partitioned directory
ST.B        TLCK.(A5)              Lock current task
MOVE.B      #2,PRT$(A6)            Set input port #
MOVE.B      #5,FEC$(A6)            Set file expansion count
ST.B        ECF$(A6)               Disable console echo
MOVEA.L     BIOS.(A5),A0           Read system ID characters
MOVE.W      B_SID(A0),D0
```

Assembly Format. PDOS assembly text has the following conventions:

a. A comment line before any entry address.
b. 2 spaces preceding a conditional branch.
c. Semi-colon with space for comment.

```
 *
 LABEL   CMPI.W  #10,D1  ; LESS THAN 10?
           BLT.S LABEL   ; Y
```

Source file documentation. PDOS source files have the following conventions:

a. Assembler TTL directive
b. File name followed by last update date

```
 TTL     FILE - PDOS PROGRAM FILE
  *       FILE:SR   07/22/87
  ****************************************
  *                                      *
  *       FFFFFF IIII LL     EEEEEE      *
  *       FF      II  LL     EE          *
  *       FF      II  LL     EE          *
  *       FFFFF   II  LL     EEEEE       *
  *       FF      II  LL     EE          *
  *       FF      II  LL     EE          *
  *       FF     IIII LLLLLL EEEEEE      *
  *                                      *
  *=======================================
```

c. Company identification with copyright notices

```
  *       Eyring Research Institute Inc.
  *       Copyright 1983-87
  *       ALL RIGHTS RESERVED
  *=
```

d. Module identification
e. Author of program
f. Who authorizes any changes
g. Revision history

```
*=                Module Name: FILE
*=                     Author: John Doe
*=      Changes Authorized by:
*=           Revision History:
*=
*=      DATE     R.V    DESCRIPTION
*=
*=      07/08/87 2.36   D$INT called from XCTB
*=      07/18/87 2.37   XLER enables echo ECF$
*=        07/22/87 2.38   Reset event
```

h. Program ID

```
FILE    IDNT    2.38    M68000 PDOS
*=
*=*************************************
        PAGE
```

PDOS Assembly Language Calls

PDOS assembly primitives are one word A-line instructions which normally use the exception vector at memory location $00000028. Most primitives use 68000 registers to pass parameters to and results from resident PDOS routines. Registers for system calls are generally used from D0 up and A0 up. Some calls (XPMC, XTAB, and XDMP) pass the relative address to the call by placing the address word immediately following the call. Status returns are used after the call. Some primitives return an error in the status register while other primitives return a status depending on the state of the primitive. For example, the XGCB (conditional get character) primitive returns one the following conditions in the status register: EQ - no character; LO - **Ctrl C**; LT - **Esc**; MI - **Ctrl C** or **Esc**.

```
LOOP    XGCB                ;CHARACTER?
          BEQ.S NONE        ;N
          BLO.S QUIT        ;Y, ^C, DONE
          BLT.S NEXT        ;CONTINUE
        CMPI.B  #'0',D0     ;NUMBER
        . . .
```

PDOS primitives return error conditions in the processor status register. This facilitates error processing by allowing your program to do long or short branches on different error conditions. D0 holds the error code and the status is either NE for no error code or the error code itself. The following example demonstrates trapping an error after a PDOS call:

```
    CALLX   LEA.L   FILEN(PC),A1 ;GET FILE NAME
            XSOP                 ;OPEN FILE, ERROR?
              BNE.S ERROR        ;Y
            MOVE.W  D1,SLTN(A4)  ;N, SAVE SLOT #
```

The following illustrates how some of these constants might be used:

```
BSET.B      #~118,118/8+EVTB.(A5)  Set event 118
MOVEA.L     MAIL.(A5),A0           Point to the MAIL array
MOVE.L      TICS.(A5),D1           Read system tics
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          BLT.S LABEL   ; Y
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```
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*       FILE:SR   07/22/87
****************************************
*                                      *
*       FFFFFF IIII LL     EEEEEE      *
*       FF      II  LL     EE          *
*       FF      II  LL     EE          *
*       FFFFF   II  LL     EEEEE       *
*       FF      II  LL     EE          *
*       FF      II  LL     EE          *
*       FF     IIII LLLLLL EEEEEE      *
*                                      *
*=***************************************
```

c. Company identification with copyright notices

```
*       Eyring Research Institute Inc.
*       Copyright 1983-87
*       ALL RIGHTS RESERVED
*=
```

d. Module identification
e. Author of program
f. Who authorizes any changes
g. Revision history

```
*=                Module Name: FILE
*=                     Author: John Doe
*=      Changes Authorized by:
*=           Revision History:
*=
*=      DATE     R.V    DESCRIPTION
*=
*=      07/08/87 2.36   D$INT called from XCTB
*=      07/18/87 2.37   XLER enables echo ECF$
*=        07/22/87 2.38   Reset event
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```
LOOP    XGCB                ;CHARACTER?
          BEQ.S NONE        ;N
          BLO.S QUIT        ;Y, ^C, DONE
          BLT.S NEXT        ;CONTINUE
        CMPI.B  #'0',D0     ;NUMBER
        . . .
```

PDOS primitives return error conditions in the processor status register. This facilitates error processing by allowing your program to do long or short branches on different error conditions. D0 holds the error code and the status is either NE for no error code or the error code itself. The following example demonstrates trapping an error after a PDOS call:

```
    CALLX   LEA.L   FILEN(PC),A1 ;GET FILE NAME
            XSOP                 ;OPEN FILE, ERROR?
              BNE.S ERROR        ;Y
            MOVE.W  D1,SLTN(A4)  ;N, SAVE SLOT #
```

System Support Calls cont.

XPAD - Pack ASCII date
XUAD - Unpack ASCII Date
XUDT - Unpack date
XUTM - Unpack time
XWDT - Write date
XWTM - Write time
XGNP - Get next parameter

File Support Calls

File support calls augment the file manager. Important functions such as copying files, appending files, sizing disks, and resetting disks are included here.

XFFN - Fix file name
XLFN - Look for name in file slots
XLST - List file directory
XBFL - Build file directory list
XRDE - Read next directory entry
XRDN - Read directory entry by name
XAPF - Append file
XCPY - Copy file
XCHF - Chain file
XLDF - Load file
XRCN - Reset console inputs
XRST - Reset disk
XSZF - Get disk size

File Management Calls

The file management calls of PDOS use the file lock (event 120) to prevent conflicts between multiple tasks. Functions such as defining, deleting, reading, writing, positioning, and locking are supported by the file manager.

XDFL - Define file
XRNF - Rename file
XRFA - Read file attributes
XWFA - Write file attributes
XWFP - Write file parameters
XDLF - Delete file
XZFL - Zero file
XSOP - Open sequential file
XROO - Open random read only file
XROP - Open random file
XNOP - Open shared random file
XLKF - Lock file
XULF - Unlock file
XRFP - Read file position
XRWF - Rewind file

File Management Calls cont.

XPSF - Position file
XRBF - Read bytes from file
XRLF - Read line from file
XWBF - Write bytes to file
XWLF - Write line to file
XFBF - Flush buffers
XFAC - File altered check
XCFA - Close file with attribute
XCLF - Close file

Disk Access Calls

Disk access calls use the read/write logical sector routines in the PDOS BIOS. A disk lock (event 121) is used to make these calls autonomous and prevent multiple commands from being sent to the disk controller.

XISE - Initialize sector
XRSE - Read sector
XWSE - Write sector
XRSZ - Read sector zero

50	Bad File Name
51	File Already Defined
52	File Not Open
53	File Not Defined
54	Bad File Attribute
55	Too Few Contiguous
56	End of File
57	File Directory Full
58	File Writ/Del Prot
59	Bad File Slot
60	File Space Full
61	File Already Open
62	Bad Message Ptr Call
63	Bad Object Tag
64	
65	Not Executable
66	Bad Port/Baud Rate
67	Bad Parameter
68	Not PDOS Disk
69	Out of File Slots
70	Position > EOF
71	AC File Nesting > 2
72	Too Many Tasks
73	Not Enough Memory
74	Non-existent Task
75	File Locked
76	
77	Not Memory Resident
78	Msg Buffer Full
79	Bad Memory Address
80	Bad Driver Call
81	
82	
83	Delay Queue Full
84	
85	Task Abort
86	Suspend on Port 0
87	Exception

The following section describes each assembly call in alphabetical order. The description includes its syntax, the PDOS module in which it is found, possible errors, and an example demonstrating how the call may be used.

X881

Save 68881 Enable

Value: $A006

Module: MPDOSK1

Syntax: X881

Registers: None

Description: The SAVE 68881 ENABLE sets the BIOS save flag (SVF$(A6)) thus signaling the PDOS BIOS to save and restore 68881 registers and status during context switches. The save flag is again cleared by exiting to the PDOS monitor.

See Also: BIOS in *PDOS Developer's Reference Manual*

Possible Errors: None

Example:

```
START   X881
        FMOVE.L #100,FP0
        FDIV.W  #3,FP0
```

XAPF

Append File

Value:

$A0AA

Module:

MPDOSF

Syntax:

XAPF
<status error return>

Registers:

In (A1) = Source file name
(A2) = Destination file name

A **Ctrl C** will terminate this primitive and return error -1 in data register D0.

Description:

The APPEND FILE primitive is used to append two files together. The source and destination file names are pointed to by address registers A1 and A2, respectively. The source file is appended to the end of the destination file. The source file is not altered.

Possible Errors:

-1 = Break
50 = Bad File Name
53 = File Not Defined
60 = File Space Full
61 = File Already Open
68 = Not PDOS Disk
69 = Out of File Slots
Disk errors

Example:

```
APFL    LEA.L   SF1(PC),A1 ;SOURCE FILE NAME
        LEA.L   SF2(PC),A2 ;DESTINATION FILE NAME
        XAPF               ;APPEND
          BNE.S ERROR      ;ERROR
        ....               ;SUCCESS

SF1     DC.B    'FILE1',0
SF2     DC.B    'FILE2',0
        EVEN
```

XBCP

Baud Console Port

Value: $A070

Module: MPDOSK2

Syntax:
XBCP
<status error return>

Registers:
In D2.W = FWPI 8DCS / <port #>
D3.W = Baud rate
D4.W = Port type
D5.L = Port base

Description:
The BAUD CONSOLE PORT primitive initializes any one of the PDOS I/O ports and binds a physical UART to a character buffer. The primitive sets handshaking protocol, receiver and transmitter baud rates, and enables receiver interrupts.

```
F8BT. = FWPI 8DCS
        \\\\ \\\\_ 0 = Ctrl S Ctrl Q enable
         \\\\ \\\_ 1 = Ignore control character
          \\\\ \\_ 2 = DTR enable
           \\\\ \_ 3 = 8-bit character enable
            \\\\__ 4 = Receiver interrupts disable
             \\\__ 5 = Even parity enable
              \\__ 6 = *Reserved
               \__ 7 = **Reserved

       *Used to clear all bits
```

Data register D2 selects the port number and sets (or clears) the corresponding flag bits. If D2.W is negative, then the absolute value is subsequently used and the port number is stored in U2P$(A6). The right byte of data register D2 (bits 0-7) selects the console port. The left byte of D2.W (bits 8-15) selects various flag options including **Ctrl S Ctrl Q** and/or DTR handshaking, receiver parity and interrupt disable, and 8-bit character I/O.

The receiver and transmitter baud rates are initialized to the same value according to register D3. Register D3 ranges from 0 to 8 or the corresponding baud rates of 19200, 9600, 4800, 2400, 1200, 600, 300, 110, 38400. If register D3 is equal to -1, then only port 2 is set. If data register D4 is non-zero, then it selects the port type and register D5 selects the port base address. These parameters are system-defined and correspond to the UART module. If register D4 is zero, there is no change.

D3.W = Baud = 0 = 19200 baud
1 = 9600 baud
2 = 4800 baud
3 = 2400 baud
4 = 1200 baud
5 = 600 baud
6 = 300 baud
7 = 110 baud
8 = 38400 baud

Baud rate 38400 is not supported by all BIOSes.

See Also:

XRPS - Read Port Status
XSPF - Set Port Flag

Possible Errors:

66 = Bad Port/Baud Rate

Example:

```
START   MOVE.W  #$103,D2  ;PORT 3 W/^S^Q
        MOVE.W  #19200,D3 ;19.2K BAUD
        MOVEQ.L #0,D4     ;NO TYPE CHANGE
        XBCP              ;BAUD PORT
          BNE.S ERROR
        ....
```

XBFL

Build File Directory List

Value:

$A0B8

Module:

MPDOSM

Syntax:

XBFL
<status error return>

Registers:

In (A1) = List specifications
(A2) = Beginning buffer address
(A3) = End buffer address
Out (A3) = Updated buffer end address

Description:

The BUILD FILE DIRECTORY LIST primitive builds a serial list of file names in memory as selected by the list specifications. Address register A1 points to the file list specifications.

List specifications:

```
<file list> = {file}{:ext}{;level}{/disk}{/select...}
 where    {file} = 1 to 8 characters (1st alpha) (@=all,*=wild)
          {:ext} = 1 to 3 characters (:@=all,*=wild)
       {;level} = directory level (;@=all)
        {/disk} = disk number ranging from 0 to 255
      {/select} = PDOS type (/AC,/BN,/BX,/EX,/OB,/SY,/TX,/DR)
                  PDOS attribute (/*,/**)
                  Change date (/Fdy-mon-yr,/Tdy-mon-yr)
                        or    (/Fmn/dy/yr,/Tmn/dy/yr)
```

Address registers A2 and A3 point to the beginning and end of the memory buffer respectively. Register A3 is updated to a word boundary just after the last file name null.

Possible Errors:

Disk errors
67 = Bad Parameter
73 = Not Enough Memory

XBFL - Build File Directory List

Example:

```
GETL    LEA.L   SPC(PC),A1   ;POINT TO LIST
        LEA.L   BUF(PC),A2   ;GET BUFFER ADDRESS
        LEA.L   EBUF(PC),A3  ;GET END POINTER
        XBFL                 ;BUILD LIST
          BNE.S ERROR
*
PRNT    TST.B   (A1)         ;ENTRY?
          BEQ.S DONE         ;N
        XPCL                 ;Y, OUTPUT CRLF
        XPLC                 ;OUTPUT ENTRY
*
NEXT    TST.B   (A1)+        ;NEXT, DONE?
          BNE.S NEXT         ;N
        BRA.S   PRNT         ;Y
*
DONE    ....
*
ERROR   ....

SPC     DC.B    '@:SR;@/0',0
BUF     DS.B    500
EBUF    EQU     *
```

XBUG

Debug Call

Value: $A038

Module: MPDOSD

Syntax: XBUG

Registers: None

Description: The DEBUG CALL primitive breaks from the user program and enters the PDOS debugger. All registers are saved and you are prompted for additional commands. The following are legal debugger commands for the resident debugger:

```
A0-7          A-reg                  ^D             Disassemble
B{#,a}        Lst/def break          -              Open previous
D0-7          D-reg                  LF             Open next
{#}G          Go & break             #              Mem IAC
H             Help message           #,#            Mem dump
M             Last dump              #,#+           Disassemble
N#            0=Wrd,1=Byt,4=Long     #,#,#{WL}      Find B/W/L
              5=Byt skp,+2=w/o read
O             Offset                 #(0-7)         d(Ax)
P             PC                     +#             # + offset
Q             Exit
R             Reg dump
S             Status
T             Trace                  Trace options:
U             Unit
V             Control IAC            F/R/M          Dump
W{s,e}        Window                 G              Go
X             Set breaks & exit      T              Running
Z             Reset
```

If you use the SMARTBUG debugger, refer to *SMARTBUG Reference Manual* for valid commands.

See Also: XDMP - Dump Memory From Stack
XRDM - Dump Registers
PB - PDOS Debugger (*PDOS Monitor, Editor, Utilities* manual)
SMARTBUG Reference Manual

Possible Errors: None

Example:

```
          ....
          XCBC              ;BREAK?
            BLO.S CONTC     ;Y, ^C
            BLT.S ESCAP     ;Y, ESC
          BRA.S   LOOP      ;N, CONTINUE
*
CONTC     ....              ;CONTROL C

          BRA.S   BEGIN     ;START AGAIN
*
ESCAP     XPMC    BRKM      ;OUTPUT '>>BREAK'
          XEXT              ;EXIT TO PDOS
*
BRKM      DC.B    $0A,$0D   ;BREAK MESSAGE
          DC.B    '>>BREAK',0
```

XCBC

Check For Break Character

Value:

$A072

Module:

MPDOSK2

Syntax:

XCBC
<status return>

Registers:

Out SR = EQ....No break
LO....**Ctrl C**, Clear flag & buffer
LT....**Esc**, Clear flag
MI....**Ctrl C** or **Esc**

If the ignore control character bit ($02) of the port flag is set, then XCBC always returns .EQ. status.

Description:

The CHECK FOR BREAK CHARACTER primitive checks the current user input port break flag (BRKF.(A5)) to see if a break character has been entered. The PDOS break characters are **Ctrl C** and the **Esc** key. A **Ctrl C** sets the port break flag to one, while an **Esc** character sets the flag to a minus one. The XCBC primitive samples and clears this flag. The condition of the break flag is returned in the status register. An "LO" condition indicates a **Ctrl C** has been entered. The break flag and the input buffer are cleared. All subsequent characters entered after the **Ctrl C** and before the XCBC call are dropped. All open procedure files are closed and any system frames are restored. Also, the last error number flag (LEN$) is set to -1 and a "^C" is output to the port.

An "LT" condition indicates an **Esc** character has been entered. Only the break flag is cleared and not the input buffer. Thus, the **Esc** character remains in the buffer. The **Ctrl C** character is interpreted as a hard break and is used to terminate command operations. The **Esc** character is a soft break and remains in the input buffer, even though the break flag is cleared by the XCBC primitive. (This allows an editor to use the **Esc** key for special functions or command termination.)

Possible Errors:

None

XCBD

Convert Binary to Decimal

Value: $A050

Module: MPDOSK3

Syntax: XCBD

Registers:

In D1.L = Number
Out (A1) = String

Description: The CONVERT BINARY TO DECIMAL primitive converts a 32-bit, 2's complement number to a character string. The number to be converted is passed to XCBD in data register D1. Address register A1 is returned with a pointer to the converted character string located in the monitor work buffer (MWB$). Leading zeros are suppressed and a negative sign is the first character for negative numbers. The string is delimited by a null. The string has a maximum length of 11 characters and ranges from -2147483648 to 2147483647.

See Also: XCBX - Convert To Decimal In Buffer

Possible Errors: None

Example:

```
          MOVE.L  #1234,D1 ;GET NUMBER
          XCBD             ;CONVERT TO PRINT
          XPLC             ;PRINT
          ....


*****************************************
* OUTPUT LEFT JUSTIFIED NUMBER
*
*       D0.W = # OF PLACES
*       D1.L = NUMBER
*
LEFT    MOVEM.L D0/A0-A1,-(A7)
        XCBD             ;CONVERT
        MOVEA.L A1,A0    ;GET POINTER
*
LEFT02  SUBQ.W  #1,D0    ;COUNT LENGTH
        TST.B   (A0)+    ;END?
          BNE.S LEFT02   ;N
*
LEFT04  XPSP             ;OUTPUT SPACE
        SUBQ.W  #1,D0    ;DONE?
          BPL.S LEFT04   ;N
        XPLC             ;Y, OUTPUT #
        MOVEM.L (A7)+,D0/A0-A1
        RTS
```

XCBH

Convert Binary to Hex

Value: $A052

Module: MPDOSK3

Syntax: XCBH

Registers:
In D1.L = Number
Out (A1) = String

Description: The CONVERT BINARY TO HEX primitive converts a 32-bit number to its hexadecimal (base 16) representation. The number is passed in data register D1 and a pointer to the ASCII string is returned in address register A1. The converted string is found in the monitor work buffer (MWB$) of the task control block and consists of eight hexadecimal characters followed by a null.

See Also: XCHX - Convert Binary To Hex In Buffer

Possible Errors: None

Example:

```
          MOVEQ.L #123,D1 ;GET NUMBER
          XCBH            ;GET HEX CONVERSION
          MOVEQ.L #'$',D0 ;ADD HEX SIGN
          XPCC            ;PRINT
          XPLC            ;PRINT 8 HEX CHARACTERS
          ....

*******************************************
*       DUMP REGISTERS ON USER STACK
*
*       USP = A7 = RETURN PC
*                  D0-D7
*                  A0-A7
*
DMRG    MOVEA.L (A7)+,A0 ;GET RETURN ADR
        MOVE.L  #$0007BCF7,D4
        MOVE.W  #'0D',D0
*
DMRG02  XPCL             ;OUT CRLF
        XPCC             ;OUT LINE TYPE
        MOVE.W  #' :',D0
*
DMRG04  XPCC             ;OUT DELIMITER
        MOVE.L  (A7)+,D1 ;GET REGISTER
        XCBH             ;CONVERT
        XPLC             ;OUTPUT
        MOVEQ.L #' ',D0  ;CHANGE TO ' '
        LSR.L   #1,D4    ;4 DONE?
          BCS.S DMRG04   ;N
        XPCC             ;Y, OUT SPACE
        LSR.L   #1,D4    ;CRLF?
          BCS.S DMRG04   ;N
        MOVE.W  #'0A',D0 ;Y, CHANGE TO 'A'
        LSR.L   #1,D4    ;MORE?
          BCS.S DMRG02   ;Y
        JMP     (A0)     ;N, RETURN
```

XCBM

Convert to Decimal with Message

Value:

$A054

Module:

MPDOSK3

Syntax:

XCBM <message>

Registers:

In D1.L = Number
Out (A1) = String

Description:

The CONVERT TO DECIMAL WITH MESSAGE primitive converts a 32-bit, signed number to a character string. The output string is preceded by the string whose PC relative address is in the operand field of the call. The string can be up to 20 characters in length and is terminated by a null character. The number to be converted is passed to XCBM in data register D1. Address register A1 is returned with a pointer to the converted character string which is located in the monitor work buffer (MWB$) of the task control block. Leading zeros are suppressed and the result ranges from -2147483648 to 2147483647. The message address is a signed 16-bit PC relative address.

Possible Errors:

None

Example:

```
START   MOVE.L  #$80000004,D1
*
LOOP    XPMC    MES1    ;HEADING
        XCBH            ;CONVERT HEX
        XPLC
        XCBM    MES2    ;CONVERT DECIMAL
        XPLC
        SUBQ.L  #1,D1
        CMPI.L  #$7FFFFFFC,D1
          BHS.S LOOP
        XEXT
*
MES1    DC.B    $0A,$0D,'Hex $',0
MES2    DC.B    ' = ',0
        EVEN
        END     START

x>TEST
Hex $80000004 = -2147483644
Hex $80000003 = -2147483645
Hex $80000002 = -2147483646
Hex $80000001 = -2147483647
Hex $80000000 = -2147483648
Hex $7FFFFFFF = 2147483647
Hex $7FFFFFFE = 2147483646
Hex $7FFFFFFD = 2147483645
Hex $7FFFFFFC = 2147483644
x>
```

XCBP

Check for Break or Pause

Value:

$A074

Module:

MPDOSK2

Syntax:

XCBP
<status return>

Registers:

Out SR = EQ...No character
LT...Esc
LO...Ctrl C
NE...Pause

If a "BLT" instruction does not immediately follow the XCBP call, then the primitive exits to PDOS when an Esc character is entered.

If the ignore control character bit ($02) of the port flag is set, then XCBP always returns .EQ. status.

Description:

The CHECK FOR BREAK OR PAUSE primitive looks for a character from your PRT$(A6) port. Any non-control character will cause XCBP to output a pause message and wait for another character. The pause message consists of:

↵'Strike any key...'↵

A Ctrl C will abort any assigned console file and return the status "LO". If a "BLT" instruction follows the XCBP primitive and an Esc character is entered, then the call returns with status "LT". Otherwise, an Esc will abort your program to the PDOS monitor. An "EQ" status indicates that no character was entered. An "NE" status indicates a pause has occurred.

Possible Errors:

None

Example:

```
LOOP    ....            ;OUTPUT

        XCBP            ;LOOK FOR PAUSE
          BLT.S EXIT    ;ESC
        BRA.S   LOOP    ;CONTINUE
*
EXIT    ....            ;ESC
```

XCBX

Convert to Decimal in Buffer

Value:

$A06A

Module:

MPDOSK3

Syntax:

XCBX

Registers:

In D1.L = Number
(A1) = Buffer

Description:

The CONVERT TO DECIMAL IN BUFFER primitive converts a 32-bit, 2's complement number to a character string. The number to be converted is passed to XCBX in data register D1. Address register A1 points to the buffer where the converted string is stored. Leading zeros are suppressed and a negative sign is the first character for negative numbers. The string is delimited by a null. The string has a maximum length of 11 characters and ranges from -2147483648 to 2147483647.

See Also:

XCBD - Convert Binary To Decimal

Possible Errors:

None

Example:

```
            MOVEA.L A6,A1    ;POINT TO USER BUF
            MOVEQ.L #12,D1   ;GET #
            BSR.S   OUTS     ;OUTPUT TO BUFFER
            XPBC             ;OUTPUT BUFFER
            ....


OUTS        XCBX             ;CONVERT #
*
OUTS02      TST.B    (A1)+   ;END?
              BNE.S OUTS02   ;N
            SUBQ.W  #1,A1    ;Y, BACKUP
            RTS              ;RETURN
```

XCDB

Convert ASCII to Binary

Value:

$A056

Module:

MPDOSK3

Syntax:

XCDB
<status return>

Registers:

In (A1) = String
Out D0.B = Delimiter
D1.L = Number
(A1) = Updated string
SR = LT....No number
EQ....# w/o null delimiter
GT....#

XCDB does not check for overflow.

Description:

The CONVERT ASCII TO BINARY primitive converts an ASCII string of characters to a 32-bit, 2's complement number. The result is returned in data register D1 while the status register reflects the conversion results. XCDB converts signed decimal, hexadecimal, or binary numbers. Hexadecimal numbers are preceded by "$" and binary numbers by "%". A "-" indicates a negative number. There can be no embedded blanks. An "LT" status indicates that no conversion was possible. Data register D0 is returned with the first character and address register A1 points immediately after it. A "GT" status indicates that a conversion was made with a null delimiter encountered. The result is returned in data register D1. Address register A1 is returned with an updated pointer and register D0 is set to zero. An "EQ" status indicates that a conversion was made but the ASCII string was not terminated with a null character. The result is returned in register D1 and the non-numeric, non-null character is returned in register D0. Address register A1 has the address of the next character.

Possible Errors:

None

Example:

```
START   MOVEQ.L #0,D5    ;GET DEFAULT
        XPMC    MES1     ;OUTPUT PROMPT
        XGLU             ;GET REPLY
          BLS.S STRT04   ;USE DEFAULT
        XCDB             ;CONVERT, OK?
          BGT.S STRT02   ;Y
        XPMC    ERM1     ;N, REPORT
        BRA.S   START    ;TRY AGAIN
*
STRT02  MOVE.L  D1,D5    ;SAVE VALUE
        ....
STRT04

MES1    DC.B    $0A,$0D,'ANSWER=',0
ERM1    DC.B    $0A,$0D,'INVALID!',0
        EVEN
```

XCFA

Close File with Attribute

Value:

$A0D0

Module:

MPDOSF

Syntax:

XCFA
<status error return>

Registers:

In D1.W = File ID
D2.B = New attribute

Description:

The CLOSE FILE WITH ATTRIBUTES primitive closes the open file specified by data register D1. At the same time, the file attributes are updated according to the byte contents of data register D2.

D2.B	= $80	AC or Procedure file
	= $40	BN or Binary file
	= $20	OB or 68000 object file
	= $10	SY or 68000 memory image
	= $08	BX or BASIC binary token file
	= $04	EX or BASIC ASCII file
	= $02	TX or Text file
	= $01	DR or System I/O driver
	= $00	Clear file attributes

If the file was opened for sequential access and the file has been updated, then the END-OF-FILE marker is set at the current file pointer. If the file was opened for random or shared access, then the END-OF-FILE marker is updated only if the file has been extended (data was written after the current END-OF-FILE marker). The LAST UPDATE is updated to the current date and time only if the file has been altered. All files must be closed when opened! Otherwise, directory information and possibly even the file itself will be lost.

If the file is not altered, then XCFA will not alter the file attributes.

D1.W = File ID = (Disk #) x 256 + (File slot index)

See Also:

XRFA - Read File Attributes
XWFA - Write File Attributes
XWFP - Write File Parameters

Possible Errors:

52 = File Not Open
59 = Bad File Slot
75 = File Locked
Disk errors

Example:

```
        MOVE.W  D5,D1    ;GET FILE ID
        MOVE.B  #$20,D2 ;CLOSE AS OBJECT
        XCFA            ;CLOSE FILE
          BNE.S ERROR
        ....
```

XCHF

Chain File

Value: $A0AC

Module: MPDOSM

Syntax: XCHF

Registers: In A1.L = File name

The primitive returns only on error.

Description:

The CHAIN FILE primitive is used by the PDOS monitor to execute program files. The primitive chains from one program to another according to the file type. Address register A1 points to the chain file name. The file type determines how the file is to be executed.

If the file is typed "OB" or "SY", then the 68000 loader is called (XLDF). If the file is typed "BX" or "EX", then the PDOS BASIC interpreter loads the file and begins executing at the lowest line number. Likewise, if the file is typed "AC", then control returns back to the PDOS monitor and further requests for console characters reference the file.

The XCHF call returns only if an error occurs during the chain operation. All other errors, such as those occurring in BASIC, return to the PDOS monitor. Parameters may be passed from one program to another through the user TEMP variables located in the task control block or through the system messages buffers.

See Also: XEXZ - Exit To Monitor With Command

Possible Errors:

50 = Bad File Name
53 = File Not Defined
60 = File Space Full
63 = Bad Object Tag
65 = Not Executable
77 = Not Memory Resident
Disk errors

Example:

```
            LEA.L   FILEN(PC),A1 ;GET FILE NAME
            XCHF                ;CHAIN FILE
            XERR                ;PROBLEM
    *
    FILEN   DC.B    'NEXTPRGM',0
            EVEN
```

XCHX

Convert Binary to Hex in Buffer

Value: $A068

Module: MPDOSK3

Syntax: XCHX

Registers:

In D1.L = Number
(A1) = Output buffer

Description:

The CONVERT BINARY TO HEX IN BUFFER primitive converts a 32-bit number to its hexadecimal (base 16) representation. The number is passed in data register D1 and a pointer to a buffer in address register A1. The converted string consists of eight hexadecimal characters followed by a null.

See Also: XCBH - Convert Binary To Hex

Possible Errors: None

XCHX - Convert Binary to Hex in Buffer

Example:

```
START   MOVE.L  #$80000004,D1
        *
        LOOP    MOVEA.L A6,A1    ;USER BUFFER
                BSR.S   OUTS     ;OUT HEADING
                  DC.W  MES1-*
                XCHX             ;CONVERT HEX
        *
        LOOP2   TST.B   (A1)+    ;END?
                  BNE.S LOOP2    ;N
                SUBQ.W  #1,A1    ;Y
                BSR.S   OUTS     ;' = '
                  DC.W  MES2-*
                XCBX             ;CONVERT DECIMAL
        *
        LOOP4   TST.B   (A1)+    ;END?
                  BNE.S LOOP4    ;N
                XPBC             ;Y, OUTPUT
                SUBQ.L  #1,D1
                CMPI.L  #$7FFFFFFC,D1
                  BHS.S LOOP
                XEXT
        *
        OUTS    MOVEA.L (A7),A0 ;GET ADDRESS
                ADDQ.L  #2,(A7) ;ADJUST PC
                ADDA.W  (A0)+,A0
        *
        OUTS2   MOVE.B  (A0)+,(A1)+
                  BNE.S OUTS2
                SUBQ.W  #1,A1
                RTS
        *
        MES1    DC.B    $0A,$0D,'Hex $',0
        MES2    DC.B    ' = ',0
                EVEN
                END     START

        x>TEST
        Hex $80000004 = -2147483644
        Hex $80000003 = -2147483645
        Hex $80000002 = -2147483646
        Hex $80000001 = -2147483647
        Hex $80000000 = -2147483648
        Hex $7FFFFFFF = 2147483647
        Hex $7FFFFFFE = 2147483646
        Hex $7FFFFFFD = 2147483645
        Hex $7FFFFFFC = 2147483644
        x>
```

XCLF

Close File

Value: $A0D2

Module: MPDOSF

Syntax:
XCLF
<status error return>

Registers: In D1.W = File ID

Description:
The CLOSE FILE primitive closes the open file as specified by the file ID in data register D1. If the file was opened for sequential access and the file was updated, then the END-OF-FILE marker is set at the current file pointer.

File ID = (Disk #) x 256 + (File slot index)

If the file was opened for random or shared access, then the END-OF-FILE marker is updated only if the file was extended (ie. data was written after the current END-OF-FILE marker). If the file has been altered, the current date and time is stored in the LAST UPDATE variable of the file directory. All open files must be closed at or before the completion of a task (or before disks are removed from the system)! Otherwise, directory information is lost and possibly even the file itself.

Possible Errors:
52 = File Not Open
59 = Bad File Slot
75 = File Locked
Disk errors

Example:

```
            MOVE.W  D5,D1    ;GET FILE ID
            XCLF             ;CLOSE FILE
              BNE.S ERROR
            ....

ERROR       CLR.L   D1
            MOVE.W  D0,D1    ;GET ERROR #
            XCBM    ERM1     ;CONVERT
            XPLC             ;OUTPUT
            ....

ERM1        DC.B    $0A,$0D
            DC.B    'PDOS CLOSE ERR ',0
            EVEN
```

XCLS

Clear Screen

Value: $A076

Module: MPDOSK2

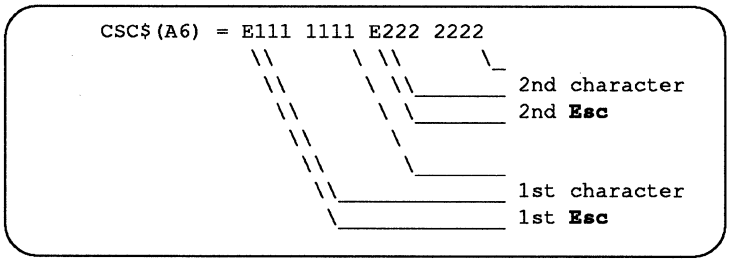
Syntax: XCLS

Registers: None

The clear screen characters are located in the user TCB variable CSC$(A6).

Description:

The CLEAR SCREEN primitive clears the console screen, homes the cursor, and clears the column counter. This function is adapted to the type of console terminals used in the PDOS system. The character sequence to clear the screen is located in the task control block variable CSC$(A6). These characters are transferred from the parent task to the spawned task during creation. The initial characters come from the BIOS module.



If CSC$ is nonzero, then the CLEAR SCREEN primitive outputs up to four characters: one or two characters; an Esc followed by a character; or an Esc, character, Esc, and a final character. The one-word format allows for two characters. The parity bits cause the Esc character to precede each character.

If CSC$ is zero or if the first byte equals $FF, then PDOS makes a call into the BIOS for custom clear screens. The entry point is B_CLS beyond the BIOS table. The MTERM utility normally maintains the CSC$ field, although it can be altered under program control. The initial definition of CSC$ is found in the MBIOS:SR file and can be modified by doing a new SYSGEN.

See Also: XRCP - Read Port Cursor Position
BIOS in *PDOS Developer's Reference Manual*

Possible Errors: None

Example:

```
....
XCLS            ;CLEAR SCREEN
XPMC    MES01   ;OUTPUT MESSAGE
....
```

XCPY

Copy File

Value:

$A0AE

Module:

MPDOSF

Syntax:

XCPY
<status error return>

Registers:

In (A1) = Source file name
(A2) = Destination file name

A **Ctrl C** terminates this primitive and returns the error -1 in register D0.

Description:

The COPY FILE primitive copies the source file into the destination file. The source file is pointed to by address register A1 and the destination file is pointed to by register A2. A **Ctrl C** halts the copy, prints "^C" to the console, and returns with error -1. The file attributes of the source file are automatically transferred to the destination file.

Possible Errors:

-1 = Break File Transfer
50 = Bad File Name
53 = File Not Defined
60 = File Space Full
61 = File Already Open
68 = Not PDOS Disk
69 = Out of File Slots
Disk errors

Example:

```
            LEA.L   FILES(PC),A1 ;SOURCE FILE NAME
            LEA.L   FILED(PC),A2 ;DEST. FILE NAME
            XCPY                 ;COPY FILE
              BNE.S ERROR        ;PROBLEM
            ....                 ;CONTINUE


FILES   DC.B    'TEMP',0
FILED   DC.B    'TEMP:BK/1',0
        EVEN
```

XCTB

Create Task Block

Value:

$A026

Module:

MPDOSK1

Syntax:

XCTB
<status error return>

Registers:

In D0.W = Task size (1k byte increments)
D1.W = Task time.B/priority.B
D2.W = I/O port
(A0) = Optional low memory pointer
(A1) = Optional high memory pointer
(A2) = Command line pointer or entry address
Out D0.L = Spawned task number

If D0.W is positive, A0 and A1 are undefined. If D0.W equals zero, then A0 and A1 are the new task's memory bounds and A2 contains the task's entry address.

If D0.W is negative, then A0 and A1 are the new task's memory bounds and A2 points to the task's command line.

Description:

The CREATE TASK primitive places a new task entry in the PDOS task list. Memory for the new task comes from either the parent task or the system memory bit map. Data register D0 controls the creation mode of the new task as well as the task size. If register D0.W is positive, then the first available contiguous memory block equal to D0.W (in 1K bytes) is allocated to the new task. If there is not a block big enough, then the upper memory of the parent task is allocated to the new task. The parent task's memory is then reduced by D0.W x 1K bytes. Address register A2 points to the new task command line. If A2 is zero, then the monitor is invoked.

Example:

```
      If D0>0 then:   D0=Task size
                    (A2)=Task command line
                         (0=Monitor)

              MOVEQ.L #10,D0  ;10 K BYTES
              MOVEQ.L #64,D1  ;PRIORITY 64
              MOVEQ.L #1,D2   ;PORT 1
              SUBA.L  A2,A2   ;CALL MONITOR
              XCTB            ;CREATE TASK
                BNE.S ERROR
```

If register D0.W is zero, then registers A0 and A1 specify the new task's memory limits. Register A2 specifies the task's starting PC. The task control block begins at (A0) and is immediately followed by an XEXT primitive. The task user stack pointer is set at (A1). Thus, the new program should allow $502 bytes at the low end and enough user stack space at the upper end.

Example:

```
      If D0=0 then: (A2)=Task entry address
                    A0-A1=New task memory limits

              MOVEQ.L #0,D0     ;USE A0-A1 BOUNDS
              MOVEQ.L #64,D1    ;PRIORITY 64
              MOVEQ.L #1,D2     ;PORT 1
              LEA.L   SRAM,A0   ;TCB ADDR (START)
              LEA.L   ERAM,A1
              LEA.L   P(PC),A2 ;PC
              XCTB              ;CREATE TASK
                BNE.S ERROR
```

If data register D0.W is negative, then registers A0 and A1 specify the new task's memory limits. Register A2 points to the new task command line. (If A2=0, then the monitor is invoked.) The command line is transferred to the spawned program via a system message buffer. The maximum length of a command line is 64 characters. When the task is scheduled for the first time, the message buffers are searched for a command. Messages with a source task equal to $FF are considered commands and moved to the task's monitor buffer. The task CLI then processes the line. If no command message is found, then the monitor is called directly.

Example:

```
      If D0=<0 then: (A2)=Task command line
                         (0=Monitor)
                     A0-A1=New task memory limits

              MOVEQ.L #0,D0     ;USE A0-A1 BOUNDS
              MOVEQ.L #64,D1    ;PRIORITY 64
              MOVEQ.L #1,D2     ;PORT 1
              LEA.L   SRAM,A0   ;TCB ADDR (START)
              LEA.L   ERAM,A1
              LEA.L   C(PC),A2 ;PC
              XCTB              ;CREATE TASK
                BNE.S ERROR

      C       DC.B    'PRGM1',0
```

Data register D1.W specifies the new task's priority. The range is from 1 to 255. The larger the number, the higher the priority.

D1=Task priority

Data register D2.W specifies the I/O port to be used by the new task. If register D2.W is positive, then the port is available for both input and output. If register D2.W is negative, then the port is used only for output. If register D2.W is zero, then no port is assigned. Only one task may be assigned to any one input port while many tasks may be assigned to an output port. Hence, a port is allocated for input only if it is available. An invalid port assignment does not result in an error. A call is made to D$INT in the debugger module. This initializes all addresses, registers, breaks, and offsets. Finally, the spawned task's number is returned in register D0.L to the parent task. This can be used later to test task status or to kill the task.

D2=I/O port

If D2=0, then phantom port (no I/O)

If D2>0, then port is used for I/O

If D2<0, then port is used for output only

If you specify the address as a file parameter, the system does not check to see if the memory is already allocated to another task. Use caution or it may crash your system.

Possible Errors:

72 = Too Many Tasks
73 = Not Enough Memory

XDEV

Delay Set/Clear Event

Value:

$A032

Module:

MPDOSK1

Syntax:

XDEV
<status error return>

Registers:

In D0.L = Time
D1.B = Logical Event (+=Set(1), -=Clear(0))

☞

If D0.L=0, then the D1.B event is removed from the delay list.

Description:

The DELAY SET/CLEAR EVENT primitive places a logical timed event in a system delay list controlled by the system clock. Data register D0.L specifies the time interval in clock tics. When it counts to zero, then the event D1.B is set if positive, or cleared if negative. If the event already exists in the delay list, it is replaced by the new entry. If the time specified in D0 equals zero, then the event equal to D1.B is removed from the delay list. If D1.B is positive, event D1.B is first cleared. If D1.B is negative, event D1.B is set before placing the event in the delay list and exiting the primitive.

See Also:

XSEF - Set Event Flag With Swap
XSEV - Set Event Flag
XSUI - Suspend Until Interrupt
XTEF - Test Event Flag
XDPE - Delay on Physical Event

Possible Errors:

83 = Delay Queue Full

Example:

```
GETC    XGCC                ;CHARACTER?
          BNE.S GETC2       ;Y
        MOVEQ.L #100,D0     ;N, GET DELAY
        MOVE.L  #128,D1     ;USER LOCAL EVENT
        XDEV                ;DELAY 128 1 SECOND
          BNE.S GETC        ;FULL
        LSL.W   #8,D1       ;GET 128/(PORT+96)
        MOVE.B  #96,D1
        ADD.B   PRT$(A6),D1
        XSUI                ;SUSPEND
        CMP.B   D0,D1       ;CHARACTER EVENT?
          BEQ.S GETC        ;Y
        XRTM                ;N, READ TIME
        MOVE.B  7(A1),D0    ;GET LAST CHARACTER
        CMP.B   T(A6),D0    ;SAME TIME?
          BEQ.S GETC        ;Y, TRY AGAIN
        MOVE.L  (A1)+,T(A6) ;N, SAVE NEW TIME
        MOVE.L  (A1),T+4(A6)
        CLR.B   T+8(A6)
        BSR.S   POSIT       ;POSITION & OUTPUT TIME
          DC.W  23*256+11
          DC.W  0
        BRA.S   GETC        ;TRY AGAIN
```

XDFL

Define File

Value:

$A0D4

Module:

MPDOSF

Syntax:

XDFL
<status error return>

Registers:

In D0.W = # of contiguous sectors
(A1) = File name

Description:

The DEFINE FILE primitive creates a new file entry in a PDOS disk directory, specified by address register A1. A PDOS file name consists of an alphabetic character followed by up to 7 additional characters. An optional 3 character extension can be added if preceded by a colon. Likewise, the directory level and disk number are optionally specified by a semicolon and slash respectively. The file name is terminated with a null.

The filename convention is as follows where upper and lower case are unique.:

APPPPPPP:PPP;NNN/NNN

-- Auto-create flag may prefix filename
A -- Alpha characters A-Z or a-z
P -- Printable characters except ":", ";", "/". The "." character may be used, but will conflict with the monitor command separator unless the filename is enclosed within parentheses
N -- Number in the range of 0-255

Data register D0 contains the number of sectors to be initially allocated at file definition. If register D0 is nonzero, then a contiguous file is created with D0 sectors. Otherwise, the value stored in the SYRAM variable "FECT." + 1 is used to define the number of sectors that will be allocated. Each sector of allocation corresponds to 252 bytes of data. A contiguous file facilitates random access to file data since PDOS can directly position to any byte within the file without having to follow sector links. A contiguous file is automatically changed to a non-contiguous file if it is extended with non-contiguous sectors.

If the register D0 is non-zero, then the EOF pointer will be set to point at the end of the last allocated sector; otherwise, the EOF pointer will point at the beginning of the first allocated sector.

Possible Errors:

50 = Bad File Name
51 = File Already Defined
55 = Too Few Contiguous Sectors
57 = File Directory Full
61 = File Already Open
68 = Not PDOS Disk
Disk errors

Example:

```
            CLR.L   D0          ;DEFAULT SIZE
            LEA.L   FN(PC),A1   ;GET FILE NAME
            XDFL                ;DEFINE FILE
              BNE.S ERROR       ;ERROR
            ....



            MOVEQ.L #100,D0     ;100 SECTORS ALLOCATED
            LEA.L   FN(PC),A1   ;GET FILE NAME
            XDFL                ;DEFINE CONTIGUOUS
              BNE.S ERROR
            ....


FN          DC.B    'FILENAME:EXT',0
            EVEN
```

XDLF

Delete File

Value:

$A0D6

Module:

MPDOSF

Syntax:

XDLF
<status error return>

Registers:

In (A1) = File name

Description:

The DELETE FILE primitive removes the file whose name is pointed to by address register A1 from the disk directory and releases all sectors associated with that file for use by other files on that same disk. A file cannot be deleted if it is delete (*) or write (**) protected.

Possible Errors:

50 = Bad File Name
53 = File Not Defined
58 = File Delete or Write Protected
61 = File Already Open
68 = Not PDOS Disk
Disk errors

Example:

```
            LEA.L   FN(PC),A1   ;GET FILE NAME PTR
            XDLF                ;DELETE FILE
              BNE.S ERROR       ;ERROR
            ....                ;NORMAL RETURN

FN          DC.B    'TEMP/2',0
            EVEN
```

XDMP

Dump Memory From Stack

Value: $A04A

Module: MPDOSK3

Syntax: XDMP

Registers:

In USP.L = <# of bytes>.W
<start address>.L

Out USP.L = USP.L + 6

Description: The DUMP MEMORY FROM STACK primitive dumps a block of memory to the console as specified by two parameters on the user stack (USP). The left side of the output is a hexadecimal dump and the right side is a masked ($7F) ASCII dump. To use this primitive, first push a 32-bit address and then a 16-bit number of the amount of memory to be dumped. The primitive will automatically clean up the user stack.

See Also:

XBUG - Debug Call
XRDM - Dump Registers
PB - PDOS Debugger (*PDOS Monitor, Editor, Utilities* manual)

Possible Errors: None

Example:

```
START   PEA.L   START(PC)
        MOVE.W  #32,-(A7)
        XDMP
        XEXT
        END     START
x>MASM20 TEMP:SR,#TEMP
x>TEMP
0000DD00: 487A FFFE 3F3C 0020 A04A A00E 044F 5248 Hz..?<. .J...ORH
0000DD10: 20CC 20C9 43EE 068E 4298 B1C9 65FA 2D49  . .C...B...e.-I
x>
```

XDPE

Delay Physical Event

Value:

$A114

Module:

MPDOSK1

Syntax:

XDPE

Registers:

In A0 = Event address
D0.L = Time in TICs for delay (0=clear entry)
D1.W = Event descriptor

Restrictions:

XDPE does not initialize the event like XDEV. You must initialize the event before using this call. If the event does not time out, clear it by setting the time to 0.

Description:

XDPE causes the specified event to be set/cleared after the specified time has elapsed. Each event can have only one delayed action pending. Successive calls will supersede pending requests. Only the lower eight bits of the descriptor are used. To cancel pending actions, specify a delay time of 0.

The event descriptor is a 16-bit word that defines both the bit number at the specified A0 address and the action to take on the bit. The following bits are defined:

```
Bit number -- 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
               T x   x  x  x  x x x S x x x x B B B

       T = Should the bit be toggled on scheduling?
             1=Yes (toggle), 0=No (do not toggle)
       S = Suspend on event bit clear or set
             1=Suspend on SET, 0=Suspend on CLEAR
       BBB = The 680x0 bit number to use as an event
       x = Reserved, should be 0
```

Since the bit number is specified in the lower three bits of the descriptor, you may use the descriptor with the 680x0 BTST, BCLR, BSET instructions.

See Also:

XDEV - Delay Set/Clear Event
XSOE - Suspend on Physical Event
XTLP - Translate Logical to Physical Event

Example:

```
        ...
        MOVE.L          #$80800081,D1   ; SET DESCRIPTORS
        LEA.L           PEV(PC),A0      ; GET PEV ADDRESS
        MOVEA.L         A0,A1           ; COPY FOR EV1
        MOVE.L          #100,D0         ; SET TIMEOUT
        BCLR.B          D1,(A0)         ; CLEAR TIMEOUT EV0
        XDPE                            ; START DELAY TIMER
        XSOE                            ; SUSPEND ON EITHER
                                          BIT 0 SET OR BIT 1
                                          SET VIA DELAY TIMER
        ...
PEV     DC.W            0
```

XDTV

Define Trap Vectors

Value: $A024

Module: MPDOSK1

Syntax: XDTV

Registers:

In D1.L = TVCZ FEDC BA98 7654 3210
(A0) = Table base address
(A1) = Vector table address

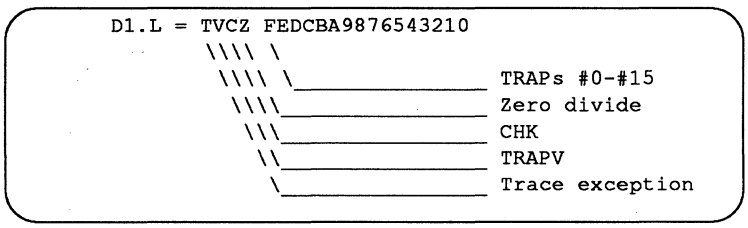
Vector table:

```
DC.L TRAP #0-<BASE ADR>
....
DC.L TRAP #15-<BASE ADR>
DC.L ZDIV-<BASE ADR>
DC.L CHK-<BASE ADR>
DC.L TRAPV-<BASE ADR>
DC.L TRACE-<BASE ADR>
```

The vector table size is variable and each entry corresponds to non-zero bits in the mask register (D1.L). Each entry is a long signed displacement from the base address register.

Description:

The DEFINE TRAP VECTORS primitive loads user routine addresses into the task control block exception vector variables. Each task has the option to process its own TRAP, zero divide, CHK, TRAPV, and/or trace exceptions. Data register D1 selects which vectors are to be loaded according to individual bits corresponding to vectors in the vector table pointed to by address register A1. Bits 0 through 19 (right to left) correspond to TRAPs 0 through 15, zero divide, CHK, TRAPV, and trace exceptions. A 1 bit moves a vector from the vector table (biased by base address A0) into the task control block.



When an exception occurs, the task control block is checked for a corresponding non-zero exception vector. If found, then the return address is pushed on the user stack (USP) followed by the exception address and condition codes. PDOS next moves to user mode and executes a return with condition codes (RTR). This effectively acts like a jump subroutine with the return address on the user stack.

IF <excp>$(A6) THEN 1) Push return on USP
2) Push xxx$(A6) on USP
3) Push CCs on USP
4) Move to user mode
5) Exit with RTR
ELSE PDOS error routine

The trace processing is handled differently. If the processor is in supervisor mode when a trace exception occurs, the trace bit is cleared and the exception is dismissed. The processor remains in supervisor mode. If the processor is in user mode and there is a non-zero trace variable in the task control block, then the trace is again disabled, the trace processor address is pushed on the supervisor stack along with status, and a return from exception is executed (RTE).

IF <sup> THEN 1) Disable trace
2) Exit in supervisor mode
ELSE IF TRC$(A6) THEN 1) Disable trace
2) Leave on stack
3) Push TRC$(A6)
4) Push SR+$2000
5) Exit with RTE
ELSE PDOS error routine

Possible Errors:

None

See Also:

XVEC - Set/Read Exception Vector

Example:

```
*                TVCZFEDCBA9876543210
VCON    EQU      %1111100000000100001
SVECT   MOVE.L   #VCON,D1  ;GET CONTROL VAR
        LEA.L    VT(PC),A0 ;POINT TO TABLE
        MOVEA.L  A0,A1     ;BASE=TABLE
        XDTV               ;SET VECTORS
        ....


VT      DC.L     TRAP00-VT ;TRAP #0
        DC.L     TRAP05-VT ;TRAP #5
        DC.L     TRAP15-VT ;TRAP #15
        DC.L     ZDIV-VT   ;ZERO DIVIDE
        DC.L     CHKP-VT   ;CHK PROCESSOR
        DC.L     TRPV-VT   ;TRAPV PROCESSOR
        DC.L     TRCE-VT   ;TRACE
```

XERR

Return Error D0 to Monitor

Value: $A00C

Module: MPDOSK1

Syntax: XERR

Registers: In D0.W = Error code

Description: The RETURN ERROR D0 TO MONITOR primitive exits to the PDOS monitor and passes an error code in data register D0. PDOS prints "PDOS ERR", followed by the decimal error number. The error call can be intercepted by changing the value of the ERR$ variable in the task TCB. This allows you to customize your own monitor.

See Also: XEXT - Exit To Monitor
XEXZ - Exit To Monitor With Command

Possible Errors: None

Example:

```
          XRSE            ;READ SECTOR
            BNE.S RERR    ;ERROR
          ....


RERR      CMPI.W  #56,D0  ;EOF?
            BNE.S RERR2   ;N
          XCLF            ;Y, CLOSE FILE
            BNE.S RERR2
          RTS
*
RERR2     XERR            ;RETURN ERROR
```

XEXC

Execute PDOS Call D7.W

Value: $A030

Module: MPDOSK1

Syntax: XEXC

Registers: In D7.W = Aline PDOS CALL

Description: The EXECUTE PDOS CALL D7.W primitive executes a variable PDOS primitive contained in data register D7. Any registers or error conditions apply to the corresponding PDOS call.

Possible Errors: Call dependent

Example:

```
*************************************
*       APPEND FILE
*
*       AF <file1>,<file2>
*
APDF    MOVE.W  #XAPF$,D7 ;APPEND COMMAND
        BRA.S   RNFL02
*
*************************************
*       COPY FILE
*
*       CF <file1>,<file2>
*
CPYF    MOVE.W  #XCPY$,D7 ;COPY COMMAND
        BRA.S   RNFL02
*
*************************************
*       RENAME FILE
*
*       RN <file1>,<file2>
*
RNFL    MOVE.W  #XRNF$,D7 ;RENAME COMMAND
*
RNFL02  XGNP              ;SOURCE FILE
          BLE.S ERR67
        MOVEA.L A1,A2     ;SAVE
        XGNP              ;DESTINATION FILE
          BLE.S ERR67
        EXG.L   A1,A2
        XEXC              ;EXECUTE D7.W
          BNE.S RNFL04    ;ERROR
        XEXT              ;RETURN
*
ERR67   MOVEQ.L #67,D0    ;PARAMETER ERROR
*
RNFL04  XERR              ;ERROR
```

XEXT

Exit to Monitor

Value: $A00E

Module: MPDOSK1

Syntax: XEXT
(Always exits to monitor)

Registers: None

Description: The EXIT TO MONITOR primitive exits a user program and returns to the PDOS monitor. The exit can be intercepted by changing the value of the EXT$ variable in the task TCB. This primitive allows you to customize your own monitor.

See Also: XERR - Return Error D0 To Monitor
XEXZ - Exit To Monitor With Command

Possible Errors: None

Example:

```
XCLF            ;CLOSE FILE, ERROR?
  BNE.S ERROR   ;Y, DO ERROR CALL
XEXT            ;N, RETURN TO MONITOR
```

XEXZ

Exit to Monitor with Command

Value: $A04C

Module: MPDOSK1

Syntax: XEXZ
(exits to monitor)

Registers: In (A1) = Command string

Description: The EXIT TO MONITOR WITH COMMAND primitive exits a user program and returns to the PDOS monitor. In addition, the monitor command buffer is loaded with the string pointed to by address register A1. This is useful in passing back parameters to the monitor or to chain to another program. The exit can be intercepted by changing the value of the EXT$ variable in the task TCB. This primitive allows you to customize your own monitor.

See Also: XERR - Return Error D0 To Monitor
XEXT - Exit To Monitor

Possible Errors: None

Example:

```
EXIT   LEA.L  CMD(PC),A1   ;GET COMMAND
       XEXZ                ;EXIT
*
CMD    DC.B   'PRGM2',0
```

XFAC

File Altered Check

Value:

$A0CE

Module:

MPDOSF

Syntax:

XFAC
<status error return>

Registers:

In (A1) = FILE NAME
Out CC = File not altered
CS = File altered
NE = Error

Description:

The FILE ALTERED CHECK primitive looks at the alter bit (bit $80) of the file pointed to by address register A1. If the bit is zero (not altered), then the primitive returns with the carry status bit clear. If the alter bit is set (file altered), then it is cleared and the primitive returns with carry set. If either case, the bit is always cleared.

Possible Errors:

Disk errors

Example:

```
      XGNP            ;GET PARAMETER
      XFAC            ;CHECK FOR FILE ALTERED
        BNE.S @0002   ;ERROR
        BCC.S FALSE   ;NOT ALTERED, RETURN FALSE
      BRA.S   TRUE    ;ALTERED, TRUE
```

XFBF

Flush Buffers

Value: $A0F8

Module: MPDOSF

Syntax: XFBF
<status error return>

Registers: None

Description: The FLUSH BUFFERS primitive forces all file slots with active channel buffers to write any updated data to the disk. It thus does a checkpoint of any open and altered file.

Possible Errors: Disk errors

Example:

```
LOOP  MOVEQ.L #5*TPS,D0 ;DELAY 5 SECS
      MOVE.W  #128,D1   ;  EVEN 128
      XDEV
      XSUI              ;SUSPEND
      XFBF              ;CHECK POINT DISK
      BRA.S   LOOP
```

XFFN

Fix File Name

Value:

$A0A0

Module:

MPDOSF

Syntax:

XFFN
<status error return>

Registers:

In (A1) = File name
Out D0.L = Disks(4th/3rd/2nd/1st)
TW0$ = Disk
(A1) = MWB$, Fixed file name

Description:

The FIX FILE NAME primitive parses and verifies a character string for file name, extension, directory level, and disk number. The results are returned in the 32-character monitor work buffer (MWB$(A6)). Data register D0 is also returned with the disk numbers in the disk path. The first disk number in the disk path is returned in the monitor word temp (TW0(A6). The error return is used for an invalid file name.

The filename convention is as follows where upper and lower case are unique:

APPPPPPP:PPP;NNN/NNN

-- Auto-create flag may prefix filename
A -- Alpha characters A-Z or a-z
P -- Printable characters except ":", ";", "/". The "." character may be used, but will conflict with the monitor command separator unless the filename is enclosed within parentheses
N -- Number in the range of 0-255

The monitor work buffer is cleared and the following assignments are made:

0(A1) =	File name
8(A1) =	File extension
11(A1) =	File directory level

System defaults are used for the disk number and file directory level when they are not specified in the file name.

See Also:

XRDN - Read Directory Entry By Name

Possible Errors:

50 = Bad File Name

Example:

```
        XGLU            ;GET INPUT LINE
        XFFN            ;FIX FILE NAME
          BNE.S ERROR   ;ERROR IN NAME
        ....
```

XFTD

Fix Time and Date

Value: $A058

Module: MPDOSK3

Syntax: XFTD

Registers:

Out D0.W = Hours * 256 + Minutes
D1.W = (Year * 16 + Month) * 32 + Day

Description:

The FIX TIME & DATE primitive returns a two-word encoded time and date generated from the system timers. The resultant codes include month, day, year, hours, and minutes. The ordinal codes can be sorted and used as inputs to the UNPACK DATE (XUDT) and UNPACK TIME (XUTM) primitives.

Data register D0.W contains the time and register D1.W contains the date. This format is used throughout PDOS for time stamping items.

See Also:

XPAD - Pack ASCII Date
XRDT - Read Date
XRTM - Read Time
XUAD - Unpack ASCII Date
XUDT - Unpack Date
XUTM - Unpack Time

Possible Errors:

None

Example:

```
            LEA.L   TSTP(PC),A0 ;SAVE AREA
            XFTD                ;GET TIME STAMP
            MOVEM.W D0-D1,(A0)  ;SAVE TIME & DATE
            ....

TSTP        DS.W    2           ;TIME STAMP SAVE
```

XFUM

Free User Memory

Value:

$A040

Module:

MPDOSK1

Syntax:

XFUM
<status error return>

Registers:

In D0.W = Number of K bytes
(A0) = Beginning address

Description:

The FREE USER MEMORY primitive deallocates user memory to the system memory bit map. Data register D0.W specifies how much memory is to be deallocated while address register A0 points to the beginning of the data block.

Memory thus deallocated is available for any task use including new task creation.

The number passed to D0.W must be an even number since memory that is allocated or deallocated must be in 2K increments. If the number is odd, it will be to rounded up to a 2K boundary. If D0=0, no action is taken. If D0<0 then error 79 will occur.

Possible Errors:

79 = Bad Memory Address

Example:

```
MOVEQ.L #20,D0   ;FREE 20K
MOVEA.L A2,A0    ;AT A2
XFUM             ;FREE MEMORY
  BNE.S ERROR
```

XGCB

Conditional Get Character

Value:

$A048

Module:

MPDOSK2

Syntax:

XGCB
<status return>

Registers:

Out D0.L = Character in bits 0-7
SR = EQ....No character
LO....**Ctrl C**
LT....**Esc**
MI....**Ctrl C** or **Esc**

If the ignore control character bit ($02) of the port flag is set, then XGCB ignores **Ctrl C** and **Esc**.

Description:

The CONDITIONAL GET CHARACTER primitive checks for a character from first, the input message pointer (IMP$(A6)), second, the assigned input file (ACI$(A6)), and then finally, the interrupt driven input character buffer (PRT$(A6)). If a character is found, it is returned in the right byte of data register D0.L and the rest of the register is cleared.

If there is no input message, no assigned console port character, and the interrupt buffer is empty, the status is returned as "EQ".

The status is returned "LO" and the break flag cleared if the returned character is a **Ctrl C**. The input buffer is also cleared. Thus, all characters entered after the **Ctrl C** and before the XGCB call are dropped.

The status is returned "LT" and the break flag cleared if the returned character is the **Esc** character.

For all other characters, the status is returned "HI" and "GT". The break flag is not affected.

Possible Errors:

None

Example:

```
LOOP    XGCB            ;CHARACTER?
          BEQ.S NONE    ;N
          BLO.S QUIT    ;Y, ^C, DONE
          BLT.S NEXT    ;CONTINUE
        CMPI.B  #'0',D0 ;NUMBER?
        ....
```

XGCC

Get Character Conditional

Value:

$A078

Module:

MPDOSK2

Syntax:

XGCC
<status return>

Registers:

Out D0.L = Character in bits 0-7
SR = EQ....No character
LO....**Ctrl C**
LT....**Esc**
MI....**Ctrl C** or **Esc**

If the ignore control character bit ($02) of the port flag is set, then XGCC ignores **Ctrl C** and **Esc**.

Description:

The GET CHARACTER CONDITIONAL primitive checks the interrupt driven input character buffer and returns the next character in the right byte of data register D0.L. The rest of the register is cleared. The input buffer is selected by the input port variable (PRT$) of the TCB.

If the buffer is empty, the "EQ" status bit is set. If the character is a **Ctrl C**, then the break flag and input buffer are cleared, and the status is returned "LO". If the character is the **Esc** character, then the break flag is cleared and the status is returned "LT".

If no special character is encountered, the character is returned in register D0 and the status set "HI" and "GT".

If no port has been assigned for input (ie. port 0 or phantom port), then the routine always returns an "EQ" status.

Possible Errors:

None

Example:

```
          ....
          XGCC            ;CHARACTER?
            BEQ.S CONT    ;N, CONTINUE
            BLO.S QUIT    ;Y, ^C, QUIT
            BLT.S NEXT    ;Y, ESC, GOTO NEXT
*
WAIT      XGCR            ;Y, WAIT CHARACTER
*
CONT      ....
```

XGCP

Get Port Character

Value:

$A09E

Module:

MPDOSK2

Syntax:

XGCP
<status return>

Registers:

Out D0.L = Character in bits 0-7
SR = LO....**Ctrl C**
LT....**Esc**
MI....**Ctrl C** or **Esc**

If the ignore control character bit ($02) of the port flag is set, then XGCP ignores **Ctrl C** and **Esc**.

Description:

The GET PORT CHARACTER primitive checks for a character in the interrupt driven input character buffer. If a character is found, it is returned in the right byte of data register D0.L and the rest of the register is cleared. The input buffer is selected by the input port variable (PRT$) of the TCB.

If the interrupt buffer is empty, the task is suspended pending a character interrupt.

The status is returned "LO" and the break flag cleared if the returned character is a **Ctrl C**. The input buffer is also cleared. Thus, all characters entered after the **Ctrl C** and before the XGCR call are dropped.

The status is returned "LT" and the break flag cleared if the returned character is the **Esc** character.

For all other characters, the status is returned "HI" and "GT". The break flag is not affected.

If no port has been assigned for input, (ie. port 0 or phantom port), then an error 86 occurs.

Possible Errors:

86 = Suspend on Port 0

Example:

```
LOOP    XGCP            ;GET PORT CHARACTER
          BLO.S QUIT    ;^C, DONE
          BLT.S NEXT    ;CONTINUE
        CMPI.B  #'0',D0 ;NUMBER?
        ....
```

XGCR

Get Character

Value:

$A07A

Module:

MPDOSK2

Syntax:

XGCR
<status return>

Registers:

Out D0.L = Character in bits 0-7
SR = LO....**Ctrl C**
LT....**Esc**
MI....**Ctrl C** or **Esc**

If the ignore control character bit ($02) of the port flag is set, then XGCR ignores **Ctrl C** and **Esc**.

Description:

The GET CHARACTER primitive checks for a character from first, the input message pointer (IMP$(A6)); second, the assigned input file (ACI$(A6)); and then finally, the interrupt driven input character buffer (PRT$(A6)). If a character is found, it is returned in the right byte of data register D0.L and the rest of the register is cleared.

If there is no input message, no assigned console port character, and the interrupt buffer is empty, the task is suspended pending a character interrupt. However, if the "receiver interrupt disable" bit is set on the port, the UART type is polled for a character. If there is a character from the UART, then it is placed in the type ahead buffer.

The status is returned "LO" and the break flag cleared if the returned character is a **Ctrl C**. The input buffer is also cleared. Thus, all characters entered after the **Ctrl C** and before the XGCR call are dropped.

The status is returned "LT" and the break flag cleared if the returned character is the **Esc** character.

For all other characters, the status is returned "HI" and "GT". The break flag is not affected.

If no port has been assigned for input, (ie. port 0 or phantom port), then an error 86 occurs.

Possible Errors:

86 = Suspend on Port 0

Example:

```
LOOP    XGCR            ;GET CHARACTER
          BLO.S QUIT    ;^C, DONE
          BLT.S NEXT    ;CONTINUE
        CMPI.B  #'0',D0 ;NUMBER?
        ....
```

XGLB

Get Line in Buffer

Value: $A07C

Module: MPDOSK2

Syntax:

XGLB
{BLT.x ESCAPE} *optional*
<status return>

Registers:

In (A1) = Buffer address
Out D1.L = Number of characters
SR = EQ...↵ only
LT...**Esc**
LO...**Ctrl C**

If the ignore control character bit ($02) of the port flag is set, then XGLB ignores **Ctrl C** and **Esc**.

Description:

The GET LINE IN BUFFER primitive gets a character line into the buffer pointed to by address register A1. The XGCR primitive is used by XGLB and hence characters can come from a memory message, a file, or the task console port.

The buffer must be at least 80 characters in length. The line is delimited by a carriage return. The status returns EQUAL if only a ↵ is entered.

If an **Esc** is entered, the task exits to the PDOS monitor unless a "BLT" instruction immediately follows the XGLB call. If such is the case, then XGLB returns with status set at "LT".

If the assigned console flag (ACI$(A6)) is set, then the "&" character is used for character substitutions. "&0" is replaced with the last system error number. "&1" is replaced with the first parameter of the command line, "&2" with the second, and so forth up to "&9".

The command line can be edited with various system defined control characters. A **Backspace** ($08) moves the cursor one character to the left. A **Ctrl F** ($0C) moves the cursor one character to the right. A **Del** ($7F) deletes one character to the left. A **Ctrl D** ($04) deletes the character under the cursor. The cursor need not be at the end of the line when the ↵ is entered.

See Also: XGLU - Get Line In User Buffer

Possible Errors: None

XGLB - Get Line in Buffer

Example:

```
OPEN    XPMC    MES01       ;PROMPT
        LEA.L   BUF(PC),A2  ;GET BUFFER ADDRESS
        XGLB                ;GET LINE IN BUFFER
          BLT.S OPEN        ;DO NOT EXIT ON ESC
          BEQ.S OPEN10      ;USE DEFAULT
*
OPEN2   XSOP                ;OPEN FILE
          BNE.S OPEN4       ;ERROR
        ....

OPEN4   CMPI.W  #53,D0      ;'NOT DEFINED' ERROR?
          BNE.S OPERR       ;N
        XDFL                ;Y, DEFINE FILE, ERROR?
          BEQ.S OPEN2       ;N
*
OPERR   XERR                ;Y, REPORT ERROR
*
OPEN10  ....


MES01   DC.B    $0A,$0D,'FILE=',0
BUF     DS.B    80
```

XGLM

Get Line in Monitor Buffer

Value:

$A07E

Module:

MPDOSK2

Syntax:

XGLM
{BLT.x ESCAPE} *optional*
<status return>

Registers:

Out (A1) = String
D1.L = Number of characters
SR = EQ...↵ only
LT...**Esc**
LO...**Ctrl C**

If the ignore control character bit ($02) of the port flag is set, then XGLM ignores **Ctrl C** and **Esc**.

Description:

The GET LINE IN MONITOR BUFFER primitive gets a character line into the monitor buffer located in the task control block. The XGCR primitive is used by XGLM and hence, characters can come from a memory message, a file, or the task console port.

The buffer has a maximum length of 80 characters and is delimited by a carriage return. The status returns EQUAL if only a ↵ is entered.

If an **Esc** is entered, the task exits to the PDOS monitor unless a "BLT" instruction immediately follows the XGLM call. If such is the case, then XGLM returns with status set at "LT".

If the assigned console flag (ACI$(A6)) is set, then the "&" character is used for character substitutions. "&0" is replaced with the last system error number. "&1" is replaced with the first parameter of the command line, "&2" with the second, and so forth up to "&9".

The command line can be edited with various system-defined control characters. A **Backspace** ($08) moves the cursor one character to the left. A **Ctrl L** ($0C) moves the cursor one character to the right. A **Del** ($7F) deletes one character to the left. A **Ctrl D** ($04) deletes the character under the cursor. The cursor need not be at the end of the line when the ↵ is entered.

The last command line can be recalled to the buffer by entering a **Ctrl A** ($01). This line can then be edited using the above control characters.

Possible Errors:

None

Example:

```
        XGLM            ;GET LINE
          BEQ.S NONE
```

XGLU

Get Line in User Buffer

Value:

$A080

Module:

MPDOSK2

Syntax:

XGLU
{BLT.x ESCAPE} *optional*
<status return>

Registers:

Out (A1) = String
D1.L = Number of characters
SR = EQ...↵ only
LT...**Esc**
LO...**Ctrl C**

If the ignore control character bit ($02) of the port flag is set, then XGLU ignores **Ctrl C** and **Esc**.

Description:

The GET LINE IN USER BUFFER primitive gets a character line into the user buffer. Address register A6 normally points to the user buffer. The XGCR primitive is used by XGLU; hence, characters come from a memory message, a file, or the task console port. The line is delimited by a carriage return. The status returns EQUAL if only a ↵ is entered. Address register A1 is returned with a pointer to the first character.

The user buffer is located at the beginning of the task control block and is 256 characters in length. However, the XGLU routine limits the number of input characters to 78 plus two nulls.

If an **Esc** ($1B) is entered, the task exits to the PDOS monitor unless a "BLT" instruction immediately follows the XGLU call. If such is the case, then XGLU returns with status set at "LT".

If the assigned console flag (ACI$(A6)) is set, then the "&" character is used for character substitutions. "&0" is replaced with the last system error number. "&1" is replaced with the first parameter of the command line, "&2" with the second, and so forth up to "&9".

The command line can be edited with various system defined control characters. A **Backspace** ($08) moves the cursor one character to the left. A **Ctrl L** ($0C) moves the cursor one character to the right. A **Del** ($7F) deletes one character to the left. A **Ctrl D** ($04) deletes the character under the cursor. The cursor need not be at the end of the line when the ↵ is entered.

Possible Errors:

None

Example:

```
GETN    MOVEQ.L #DNUM,D4 ;GET DEFAULT #
        XGLU             ;GET LINE
          BEQ.S GETN2    ;USE DEFAULT
        XCBD             ;CONVERT #, ERROR?
          BLE.S ERROR    ;Y
        MOVE.L  D1,D4    ;N
*
GETN2   MOVE.L  D4,-(A7) ;SAVE #
        ....
```

XGML

Get Memory Limits

Value:

$A010

Module:

MPDOSK1

Syntax:

XGML

Registers:

Out (A0) = End TCB (TBE$)
(A1) = Upper memory limit (EUM$-USZ)
(A2) = Last loaded address (BUM$)
(A5) = System RAM (SYRAM)
(A6) = Task TCB

Description:

The GET MEMORY LIMITS subroutine returns the user task memory limits. These limits are defined as the first usable location after the task control block ($500 beyond address register A6) and the end of the user task memory. The task may use up to but not including the upper memory limit.

Address register A0 is returned pointing to the beginning of user storage (which is the end of the TCB). Register A1 points to the upper task memory limit less $100 hexadecimal bytes for the user stack pointer (USP). Register A2 is the last loaded memory address as provided by the PDOS loader. Address registers A5 and A6 are returned with the pointers to system RAM (SYRAM) and the task control block (TCB).

Possible Errors:

None

Example:

```
START   XGML              ;GET MEMORY LIMITS
*
START2  CLR.B    (A2)+    ;CLEAR MEMORY
        CMPA.L   A1,A2    ;DONE?
          BLO.S  START2   ;N
        ....
```

XGMP

Get Message Pointer

Value: $A004

Module: MPDOSK1

Syntax:
XGMP
<status return>

Registers:
In D0.B = Message slot number (0..15)
Out D0.L = Source task # (-1 = no message)
SR = EQ....Message (Event[64+Message slot #]=0)
NE....No message
D0.L = Error number 62 if message pointer error
(A1) = Message

Description:
The GET MESSAGE POINTER primitive looks for a task message pointer. If no message is ready, then data register D0 returns the error number 62 and status is set to "Not Equal".

If a message is waiting, then data register D0 returns with the source task number, address register A1 returns with the message pointer, event (64 + message slot #) is set to zero indicating message received, and status is returned equal.

See Also:
XGTM - Get Task Message
XKTM - Kill Task Message
XSMP - Send Message Pointer
XSTM - Send Task Message

Possible Errors:
62 = Bad Message Ptr Call

Example:

```
            . . .
            MOVE.W   #69,D1
            XSUI
            MOVE.B   #D,D0          ;Check message slot #5
            XGMP
              BNE.S  NOMESS         ;No message
            XPMC                    ;Print message to console
            . . .
NOMESS      XPMC            MESS
            . . .
MESS        DC.B           $0A,$0D,'NO MESSAGE POINTER',0
```

XGNP

Get Next Parameter

Value:

$A05A

Module:

MPDOSM

Syntax:

XGNP
<status return>

Registers:

Out SR = LO...No parameter
[(A1)=0]
EQ...Null Parameter
[(A1)=0]
HI...Parameter
[(A1)=PARAMETER]

Description:

The GET NEXT PARAMETER primitive parses the monitor buffer for the next command parameter. The routine does this by maintaining a current pointer into the command line buffer (CLB$) and a parameter delimiter (CMD$).

```
x>MASM SOURCE,BIN LIST ERR.SP
x>CT (ASM SOURCE,BIN),15,,3
x>DO ((DO DO),DO)
```

The XGNP primitive clears all leading spaces of a parameter. A parameter is a character string delimited by a space, comma, period, or null. If a parameter begins with a left parenthesis, then all parsing stops until a matching right parenthesis or null is found. Hence, spaces, commas, and periods are passed in a parameter when enclosed in parentheses. Parentheses may be nested to any depth.

```
x>LS.LS
```

An "LO" status is returned if the last parameter delimiter is a null or period. XGNP does not parse past a period. In this case, address register A1 is returned pointing to a null string.

```
x>MASM SOURCE,,,ERR
```

An "EQ" status is returned if the last parameter delimiter is a comma and no parameter follows. Address register A1 is returned pointing to a null string.

A "HI" status is returned if a valid parameter is found. Address register A1 then points to the parameter.

Possible Errors:

None

Example:

```
SPAC    MOVE.B  SDK$(A6),D0 ;GET SYSTEM DISK #
        XGNP                ;GET PARAMETER, OK?
          BLS.S SPAC02      ;N, USE DEFAULT
        XCDB                ;Y, CONVERT, OK?
          BLE.S ERR67       ;N, ERROR
        MOVE.L  D1,D0       ;Y
*
SPAC02  XSZF                ;GET DISK SIZE
          BNE.S ERROR       ;PROBLEM
        ....
```

XGTM

Get Task Message

Value:

$A01E

Module:

MPDOSK1

Syntax:

XGTM
<status return>

Registers:

In (A1) = Buffer address
Out D0.L = Source task #
(-1 = no message)
SR = EQ....message found
NE....no message

Description:

The GET TASK MESSAGE primitive searches the PDOS message buffers for a message with a destination equal to the current task number. If a message is found, it is moved to the buffer pointed to by address register A1. The message buffer is then released, and the status is set EQUAL. If no message is found, status is returned NE.

The buffer must be at least 64 bytes in length. (This is a configuration parameter.) The message buffers are serviced on a first in, first out basis (FIFO). Messages are data independent and pass any type of binary data.

See Also:

XGMP - Get Message Pointer
XKTM - Kill Task Message
XSMP - Send Message Pointer
XSTM - Send Task Message

Possible Errors:

None

Example:

```
LOOP    LEA.L   BUF(PC),A1      ;GET BUFFER ADR
        XGTM                    ;LOOK FOR MESSAGE
          BNE.S NONE            ;NONE
        XPCL                    ;OK, OUT CRLF
        XPLC                    ;OUT MESSAGE
        BRA.S   LOOP            ;LOOK AGAIN
*
NONE    ....

BUFFER  DS.B    64              ;MESSAGE BUFFER
```

XGUM

Get User Memory

Value: $A03E

Module: MPDOSK1

Syntax:

XGUM
<status error return>

Registers:

In D0.W = Number of K bytes
Out (A0) = Beginning memory address
(A1) = End memory address

Description:

The GET USER MEMORY primitive searches the system memory bit map for a contiguous block of memory equal to D0.W Kbytes. If found, the "EQ" status is set, address registers A0 and A1 are returned the the start and end memory address, and the memory block is marked as allocated in the bit map.

The number in register D0 must be an even number. Memory is both allocated and deallocated in 2K blocks.

See Also: XFUM - Free User Memory

Possible Errors: 73 = Not Enough Memory

Example:

```
GETM  CLR.W   -(A7)      ;PUSH .NE.
      MOVEQ.L #10,D0     ;GET 10K BYTES
      XGUM
        BNE.S @GM02      ;ERROR
      MOVE.L  A0,AV(A6)  ;SAVE
      ADDQ.W  #$04,(A7)  ;RETURN .EQ.
*
@GM02 RTR                ;RETURN
```

XISE

Initialize Sector

Value:

$A0C0

Module:

MPDOSF

Syntax:

XISE
<status error return>

Registers:

In D0.B = Disk number
D1.W = Logical sector number
(A2) = Buffer address

Description:

The INIT SECTOR primitive is a system-defined, hardware-dependent program which writes 256 bytes of data from a buffer (A2) to a logical sector number (D1) on disk (D0). This routine is meant to be used only for disk initialization and is equivalent to the WRITE SECTOR (XWSE) primitive for all sectors except 0. Sector 0 is not checked for the PDOS ID code.

See Also:

BIOS in *PDOS Developer's Reference Manual*
XRSE - Read Sector
XRSZ - Read Sector Zero
XWSE - Write Sector

Possible Errors:

Disk errors

Example:

```
          MOVEQ.L DSKN,D0          ;GET DISK #
          MOVEQ.L #0,D1            ;START AT SECTOR 0
          LEA.L   BUF(PC),A2       ;GET BUFFER PTR
*
LOOP      XISE                     ;WRITE TO DISK
            BNE.S ERROR            ;ERROR
          ADDQ.W  #1,D1            ;MOVE TO NEXT
          CMPI.W  #DISKZ,D1        ;DONE?
            BLO.S LOOP             ;N
          ....
```

XKTB

Kill Task

Value:

$A0FA

Module:

MPDOSK1

Syntax:

XKTB
<status error return>

Registers:

In D0.B = Task number

If D0.B equals zero, then kill current task. If D0.B is negative, then kill task without allocating task memory to system bit map.

Description:

The KILL TASK primitive removes a task from the PDOS task list and optionally returns the task's memory to the system memory bit map. Only the current task or a task spawned by the current task can be killed. Task 0 cannot be killed.

The kill process includes releasing the input port assigned to the task and closing all files associated with the task.

If D0=0, then kill self & deallocate memory

The task number is specified in data register D0.B. If register D0.B equals zero, then the current task is killed and its memory deallocated in the system memory bit map.

If D0>0, then kill task D0 & deallocate memory

If D0<0, then kill task ABS(D0) & do not deallocate memory

If D0.B is positive, then the selected task is killed and its memory deallocated. If D0.B is negative, then task number ABS(D0.B) is killed, but its memory is not deallocated in the memory bit map.

See Also:

XCTB - Create Task Block

Possible Errors:

74 = Non-existent Task

Example:

```
PREND   CLR.B   D0      ;KILL SELF
        XKTB            ;CALL CURRENT TASK
          BNE.S ERROR
```

XKTM

Kill Task Message

Value:

$A028

Module:

MPDOSK1

Syntax:

XKTM
<status return>

Registers:

In D0.B = Task #
(A1) = Buffer address
Out D0.L = Source task #
(-1 = no message)
SR = EQ....message found
NE....no message

Description:

The KILL TASK MESSAGE primitive allows you to read (and thus clear) any task's messages from the system message buffers.

See Also:

XGMP - Get Message Pointer
XGTM - Get Task Message
XSMP - Send Message Pointer
XSTM - Send Task Message

Possible Errors:

None

Example:

```
LOOP    MOVEQ.L #0,D0    ;SELECT TASK 0
        LEA.L   BF(PC),A1
        XKTM             ;ANY MESSAGE?
          BEQ.S LOOP     ;Y, DO AGAIN
```

XLDF

Load File

Value: $A0B0

Module: MPDOSF

Syntax:

XLDF
<status error return>

Registers:

In D1.B = Execution flag
(A0) = Start of load memory
(A1) = End of load memory
(A3) = File name

Out (A0) = EAD$ - Lowest loaded address or "OB" entry address
(A1) = BUM$ - Last loaded address

If D1.B=0, then XLDF returns to your calling program. If D1.B<>0, then the program is immediately executed.

Description:

The LOAD FILE primitive reads and loads 68000 object or binary code into user memory. The file name pointer is passed in address register A3. Registers A0 and A1 specify the memory bounds for the relocatable load. Any type of file may be loaded if the execution flag is clear. If D1.B<>0, then the file must be typed "OB" or "SY".

If data register D1.B is zero, then XLDF returns to the calling program. Otherwise, the loaded program is immediately executed.

For "OB" type files, section 0 code is loaded first followed by section 1 and so forth to section 15. All simple references among sections are resolved but no operations are allowed. The loader also sets the task entry address EAD$(A5) and register A0 to the address specified by the start tag, or to the start of the file if no start address is given. All object files must be assembled with the 3.3 assembler in order to load.

A "SY" file is generated from an "OB" file by the MSYFL utility. The condensed object is a direct memory image and must be position-independent code.

The XLDF primitive uses long word moves and may move up to three bytes more than contained in an "SY" file. As such, you must allow for extra space for data moves to an existing program.

```
Legal tags:
   0T--LABEL--vvvrrrddddddtttt
   1Saaaaaaaa            ;ENTRY POINT
   2Saaaaaaaa            ;ADDRESS
   3dd                   ;SIMPLE DATA BYTE
   4dddd                 ;SIMPLE DATA WORD
   5dddddddd             ;SIMPLE LONG DATA WORD
   6                     ;POP BYTE
   7                     ;POP WORD
   8                     ;POP LONG WORD
   9Snnnnnnnn            ;PUSH VALUE
   Dccccdddd             ;STORE MULTIPLE WORD
   ES111111111           ;SECTION LENGTH
   Fcc                   ;END OF RECORD/CHECKSUM

Illegal tags:
   AS1<symbol>           ;PUSH SYMBOL
   BO                    ;DO OPERATION
   CS1<symbol>nnnnnnnn   ;EXTERNAL DEFINITION
```

Possible Errors:

63 = Bad Object Tag
65 = Not Executable
73 = Not Enough Memory
Disk errors

Example:

```
            XGML              ;GET MEMORY LIMITS
            CLR.L   D0        ;RETURN
            ADDA.W  #$100,A0  ;ADD DISPLACEMENT
            LEA.L   FN(PC),A3 ;GET FILE NAME
            XLDF              ;LOAD FILE
              BNE.S ERROR     ;ERROR
```

XLER

Load Error Register

Value: $A03A

Module: MPDOSK1

Syntax: XLER

Registers: In D0.W = Error number

Description: The LOAD ERROR REGISTER primitive stores data register D0.W in the task control block variable LEN$(A6). This variable will replace the parameter substitution variable "&0" during a procedure file.

User programs should execute this call when an error occurs.

The enable echo flag (ECF$(A6)) is cleared by this call.

Possible Errors: None

Example:

```
ADDI.W  #300,D0 ;BIAS ERROR #
XLER            ;REPORT TO PDOS
```

XLFN

Look for Name in File Slots

Value:

$A0A2

Module:

MPDOSF

Syntax:

XLFN
<status return>

Registers:

In D0.B = Disk number
(A1) = Fixed file name
Out D3.W = File ID (Disk #/Index)
(A3) = Slot entry address
SR = NE...File name not found
EQ...File name found

If D3.W=0, then no slots are available.

Description:

The LOOK FOR NAME IN FILE SLOTS primitive searches through the file slot table for the file name as specified by registers D0.B and A1. If the name is not found, register D3.W returns with a -1 or 0. The latter indicates the file was not found and there are no more slots available. Otherwise, register D3.W returns the associated file ID and register A3 returns the address of the file slot.

A file slot is a 38-byte buffer where the status of an open file is maintained. There are 32 file slots available. The file ID consists of the disk # and the file slot index.

File slots assigned to read-only files are skipped and not considered for file match.

```
File slot format:  (38 bytes)
          0(A3) = File name.11
         11(A3) = Level.1
         12(A3) = Status.2
         14(A3) = Sector # in memory.2
         16(A3) = Pointer.4
         20(A3) = Sector index in memory.2
         22(A3) = Sector index of eof.2
         24(A3) = # bytes in end sector.2
         26(A3) = Lock.1/shared flag.1
         28(A3) = Channel buffer ptr.4
         32(A3) = Lock.1/shared flag.1
         34(A3) = Roll-out error #.2
         36(A3) = Disk #.2
```

```
Status: $01xx    Sequential
        $02xx    Random
        $06xx    Shared random
        $0Axx    Read only random
        $10xx    Driver in channel
        ....
        $xx80    Altered
        $xx04    Contiguous
        $xx02    Delete protect
        $xx01    Write protect

        $8xxx    Sector altered
        $4xxx    File altered
        $2xxx    Buffer locked in memory
```

Possible Errors:

None

Example:

```
XNOP    LEA.L   FN(PC),A1 ;POINT TO FILE NAME
        XFFN               ;FIX FILE NAME
          BNE.S ERR1       ;ERROR
        XLFN               ;LOOKUP NAME, FOUND?
          BEQ.S ERR2       ;Y, FILE ALREADY OPEN
        ....

ERR1    XPMC    MERR1      ;INVALID FILE NAME
        RTS
*
ERR2    XPMC    MERR2      ;FILE ALREADY OPEN
        RTS
*
FN      DC.B    'FILENAME',0
MERR1   DC.B    $0A,$0D,'INVALID FILE NAME',0
MERR2   DC.B    $0A,$0D,'FILE ALREADY OPEN',0
        EVEN
```

XLKF

Lock File

Value: $A0D8

Module: MPDOSF

Syntax:
XLKF
<status error return>

Registers: In D1.W = File ID

Description:
The LOCK FILE primitive locks an opened file so that no other task can gain access until an UNLOCK FILE (XULF) primitive is executed. Only the locking task has access to the locked file.

A locked file is indicated by a -1 ($FF) in the left byte of the lock file parameter (LF) of the file slot usage (FS) command. The locking task number is stored in the left byte of the task number parameter (TN).

See Also: XULF - Unlock File

Possible Errors:
52 = File Not Open
59 = Bad File Slot
75 = File Locked
Disk errors

Example:

```
        MOVE.W  D5,D1    ;GET FILE ID
        XLKF             ;LOCK FILE
          BNE.S ERROR    ;PROBLEM
        ....
```

XLKT

Lock Task

Value: $A014

Module: MPDOSK1

Syntax:
XLKT
<status return>

Registers:
Out SR = EQ...Not locked
NE...Locked

Description:
The LOCK TASK primitive locks the requesting task in the run state by setting the swap lock variable in system RAM to nonzero. The task remains locked until an UNLOCK TASK (XULT) is executed. The status of the lock variable BEFORE the call is returned in the status register.

XLKT waits until all locks (Level 2 and Level 3 locks) are cleared before the task is locked.

See Also: XULT - UNLOCK TASK

Possible Errors: None

Example:

```
          XLKT            ;LOCK TASK
            SNE.B D7      ;SET FLAG
          TAS.B   SBIT    ;START CRITICAL PROCESS
*
WAIT      TST.B   SBIT    ;OK?
            BMI.S WAIT    ;N
          TST.B   D7      ;Y, LEAVE LOCKED?
           BNE.S CONT     ;Y
          XULT            ;N, UNLOCK TASK
*
CONT      ....
```

XLSR

Load Status Register

Value: $A02E

Module: MPDOSK1

Syntax: XLSR

Registers: In D1.W = 68000 status register

Description: The LOAD STATUS REGISTER primitive allows you to directly load the 68000 status register. Of course, only appropriate bits (i.e. the interrupt mask too high, supervisor mode, trace mode, etc.) are to be set so that the system is not crashed.

See Also: XRSR - Read Status Register
XSUP - Enter Supervisor Mode

Possible Errors: None

Example:

```
MOVE.W   SR,D1      ;READ STATUS
ORI.W    #$2000,D1  ;ADD SUPERVISOR
XLSR                ;LOAD SR
```

Value: $A0A4

Module: MPDOSM

Syntax:

XLST
<status error return>

Registers:

In (A1) = List specifications

Description:

The LIST FILE DIRECTORY subroutine causes PDOS to output a formatted file directory listing to the console terminal, according to the select string pointed to by address register A1. The output may be interrupted at any time by a character being entered on the console port. An Esc character returns control to the PDOS monitor.

The format of the list specifications is defined as follows:

```
DC.B    '{file}{:ext}{;level}{/disk}{/select...}',0
where:  {file} = 1 to 8 characters (1st alpha) (@=all,*=wild)
         {:ext} = 1 to 3 characters (:@=all,*=wild)
       {;level} = directory level (;@=all)
        {/disk} = disk number ranging from 0 to 255
      {/select} = /AC = Assign Console file
                  /BN = Binary file
                  /BX = PDOS BASIC token file
                  /EX = PDOS BASIC file
                  /OB = 68000 PDOS object file
                  /SY = System file
                  /TX = Text file
                  /DR = System I/O driver
                  /*  = Delete protected
                  /** = Delete and write protected
                  /Fdy-mon-yr = selects files with date of
                                last change greater than
                                or equal to "dy-mon-yr"
                  /Tdy-mon-yr = selects files with date of
                                last change less than or
                                equal to "dy-mon-yr"
```

Possible Errors:

Disk Errors

Example:

```
MLST    XGNP            ;GET SELECT LIST
        XLST            ;CALL FOR LIST
          BNE.S ERROR   ;ERROR
        XEXT            ;EXIT TO MONITOR
```

XNOP

Open Shared Random File

Value:

$A0DA

Module:

MPDOSF

Syntax:

XNOP
<status error return>

Registers:

In (A1) = File name
Out D0.W = File attribute
D1.W = File ID

Uses multiple directory file search.

You MUST lock and position file before each multi-task access.

Description:

The OPEN SHARED RANDOM FILE primitive opens a file for shared random access by assigning the file to an area of system memory called a file slot. The file ID and file attribute are returned to the calling program in registers D1 and D0, respectively. Thereafter, the file is referenced by the file ID and not by the file name. A new entry in the file slot table is made only if the file is not already opened for shared access.

The file ID (returned in register D1) is a 2-byte number. The left byte is the disk number and the right byte is the file slot index. The file attributes are returned in register D0.

D0.W = (ABOS BETU xxxx xCWD)
D1.W = (Disk #) x 256 + (file slot index)

The END-OF-FILE marker on a shared file is changed only when the file has been extended. All data transfers are buffered through a channel buffer; data movement to and from the disk is by full sectors.

An "opened count" is incremented each time the file is shared-opened and is decremented by each close operation. The file is only closed by PDOS when the count is zero. This count is saved in the right byte of the locked file parameter (LF) and is listed by the file slot usage command (FS).

Possible Errors:

50 = Bad File Name
53 = File Not Defined
60 = File Space Full
61 = File Already Open
68 = Not PDOS Disk
69 = Out of File Slots
Disk errors

Example:

```
            LEA.L   FN(PC),A1 ;POINT TO NAME
            XNOP              ;OPEN SHARED
              BNE.S ERROR
            MOVE.W  D0,D5     ;SAVE TYPE
            SWAP    D5
            MOVE.W  D1,D5     ;SAVE FILE ID
            ....

FN          DC.B    'FILENAME:EXT',0
            EVEN
```

XPAD

Pack ASCII Date

Value:

$A00A

Module:

MPDOSK3

Syntax:

XPAD

Registers:

In (A1) = 'DY-MON-YR'
Out D1.W = (Year*16+month)*32+day
(YYYY YYYM MMMD DDDD)
(A1) = Updated
SR = .EQ. - Conversion okay
.NE. - Error

Description:

The PACK ASCII DATE primitive converts an ASCII date string to an encoded binary number in data register D1. The result is compatible with other PDOS date primitives such as XUAD.

See Also:

XFTD - Fix Time And Date
XRDT - Read Date
XRTM - Read Time
XUAD - Unpack ASCII Date
XUDT - Unpack Date

Possible Errors:

Status errors

Example:

```
STRT XPMC    MES1  ;DATE=
     XGLU          ;GET LINE
     XPAD          ;CONVERT
       BNE.S ERR   ;ERROR
     XPMC    MES2  ;D1.W=
     XCBH
     ADDQ.W  #4,41
     XPLC          ;OUTPUT
     BRA.S   STRT
*
ERR  XPMC    MES3  ;ERROR
     BRA.S   STRT
*
MES1 DC.B $0A,$0D,'DATE=',0
MES2 DC.B '  D1.W=$',0
MES3 DC.B $0A,$0D,'*ERROR',0
     EVEN
     END     STRT

x>TEST
DATE=11-NOV-86  D1.W=$AD6B
DATE=11NOV86  D1.W=$AD6B
DATE= NOV 11 86
*ERROR
DATE=
```

XPBC

Put Buffer to Console

Value: $A084

Module: MPDOSK2

Syntax: XPBC

Registers: None

Description: The PUT USER BUFFER TO CONSOLE primitive outputs the ASCII contents of the user buffer to the user console and/or SPOOL file. The output string is delimited by the null character. The user buffer is the first 256 bytes of the task control block and is pointed to by address register A6.

With the exception of control characters and characters with the parity bit on, each character increments the column counter by one. A **Backspace** ($08) decrements the counter while a ↵ ($0D) clears the counter. **Tabs** ($09) are expanded with blanks to MOD 8 character zone fields.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also: XGLB - Get Line In Buffer

Possible Errors: None

Example:

```
CLINE   MOVEA.L A6,A2     ;GET USER BUFFER PTR
*
CLINE2
        ....

        MOVE.B  D0,(A2)+ ;LOAD BUFFER, DONE?
          BNE.S CLINE2   ;N
        XPBC             ;Y, OUTPUT BUFFER
        RTS              ;CONTINUE
```

XPCB

Push Command to Buffer

Value: $A04E

Module: MPDOSM

Syntax: XPCB

Registers: In (A1) = Command string

Description: The PUSH COMMAND TO BUFFER primitive pushes the string pointed to by address register A1 into the command recall buffer. Since there is a limit on the buffer size, older commands are lost.

See Also: XGNP - Get Next Parameter

Possible Errors: None

Example:

```
        XGLU            ;GET COMMAND
        XPCB            ;PUSH FOR RECALL
        ...
```

XPCC

Put Character(s) to Console

Value: $A086

Module: MPDOSK2

Syntax: XPCC

Registers: In D0.W = Character(s)

Description: The PUT CHARACTER TO CONSOLE primitive outputs one or two ASCII characters in data register D0 to the user console and/or SPOOL file. The right byte (bits 0 through 7) is first and is followed by the left byte (bits 8 through 15) if non-zero. If the right byte or both bytes are zero, nothing is output to the console.

With the exception of control characters and characters with the parity bit on, each character increments the column counter by one. A **Backspace** ($08) decrements the counter while a ↵ ($0D) clears the counter. **Tabs** ($09) are expanded with blanks to MOD 8 character zone fields.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also: XPCR - Put Character Raw
XPDC - Put Data To Console

Possible Errors: None

Example:

```
MOVE.W  #'C^',D0  ;OUTPUT '^C'
XPCC
MOVEQ.L #$0A,D0   ;FOLLOWED BY LF
XPCC
```

XPCL

Put CRLF to Console

Value: $A088

Module: MPDOSK2

Syntax: XPCL

Registers: None

Description: The PUT CRLF TO CONSOLE primitive outputs the ASCII characters line feed <$0D> and carriage return <$0A> to the user console and/or SPOOL file. The column counter is cleared.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

Possible Errors: None

Example:

```
        XPCL            ;OUTPUT CRLF
        ...
```

XPCP

Place Character in Port Buffer

Value: $AOBC

Module: MPDOSK2

Syntax: XPCP

Registers:

In D0.B = Character to insert
D1.W = Input port number (1 to 15)

Out SR = .EQ. = High water (character is inserted)
.NE. = Character is inserted

Description: XPCP allows a character to be placed into the input buffer of any PDOS port from a task or program.

Example:

```
START   LEA.L   STRING(PC),A0  ;ADDRESS OF STRING
        MOVE.W  #3,D1          ;PLACE IN PORT 3 INPUT BUFFER
*
LOOP    MOVE.B  (A0)+,D0       ;GET CHAR,TEST FOR 0?
         BEQ.S DONE            ;Y
        XPCP                   ;PUT INTO PORT 3 INPUT
        BRA.S   LOOP
*
DONE    XEXT
*
STRING  DC.B 'HELLO PORT 3!',0
        EVEN
*
END START

>MASM TEST:SR,TEST↵
>TEST↵
>TM 3,2HELLO PORT 3!Ctrl B↵
>
```

Once the status returns EQ (high water), subsequent XPCP calls will return a status of NE as if everything were normal, but the data is discarded. Once the status of EQ is detected, the transmitting task should monitor the status of the port with the XRPS (read port status) call until bit 6 is cleared.

The port specified in the XPCP call is independent of windowing — it refers to the physical port, not the logical port.

XPCR

Put Character Raw

Value: $A0BA

Module: MPDOSK2

Syntax: XPCR

Registers: In D0.B = CHARACTER

Description: The PUT CHARACTER RAW primitive outputs the character in the lower byte of data register D0 to the user console. No attempt is made by PDOS to interpret control characters.

See Also: XPCC - Put Character(s) To Console
XPDC - Put Data To Console

Possible Errors: None

XPDC

Put Data to Console

Value: $A096

Module: MPDOSK2

Syntax: XPDC

Registers:

In D7.W = LENGTH
(A1) = DATA STRING

Description:

The PUT DATA TO CONSOLE primitive outputs data-independent bytes to the console. Address register A1 points to the string while data register D7 has the string length.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also:

XPCC - Put Character(s) To Console
XPCR - Put Character Raw

Possible Errors:

None

Example:

```
        MOVEQ.L #0,D7
        LEA.L   M(PC),A1 ;POINT TO STRING
        MOVE.B  (A1)+,D7 ;GET LENGTH
        XPDC             ;OUTPUT
        ...

M       DC.B    10,$0A,$0D
        DC.B    'THIS IS A MESSAGE'
```

XPEL

Put Encoded Line to Console

Value: $A06E

Module: MPDOSK2

Syntax: XPEL

Registers: In (A1) = Message

Description: The PUT ENCODED LINE TO CONSOLE primitive outputs to the user console the message pointed to by address register A1. An encoded message is similar to any other string with the exception that the parity bit is used to output blanks and the character $80 outputs a carriage return/line feed.

If the parity bit is set and the masked character ($7F) is less than or equal to a blank, then the numeric value of the negated character is used as the number of blanks to be inserted in the output stream. If the mask character is greater than a blank, then that character is output followed by one blank.

With the exception of control characters, each character increments the column counter by one. A **Backspace** ($08) decrements the counter while a ↵ ($0D) clears the counter. **Tabs** ($09) are expanded with blanks to MOD 8 character zone fields.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also: XPEM - Put Encoded Message To Console
XPLC - Put Line To Console
XPMC - Put Message To Console

Possible Errors: None

Example:

```
            LEA.L   M(PC),A1 ;POINT TO MESSAGE
            XPEL            ;OUTPUT MESSAGE
            ....


M           DC.B    $80,'Lev',-2,'Name:ext'
            DC.B    -6,'Type',-6,'Size',-6
            DC.B    'Dat',-'e','created',-4
            DC.B    'Las',-'t','update',0
```

The above text strings are equivalent to:

```
M       DCE.B   $80,'Lev  Name:ext'
        DCE.B   '       Type      Size'
        DCE.B   '       Date created'
        DCE.B   '    Last update',0

            ($80 is equal to a CR/LF)
```

XPEM

Put Encoded Message to Console

Value: $A09C

Module: MPDOSK2

Syntax: XPEM <message>

Registers: None

Description: The PUT ENCODED MESSAGE TO CONSOLE primitive outputs the PC relative message contained in the word following the call to the user console. An encoded message is similar to any other string with the exception that the parity bit is used to output blanks and the character $80 outputs a carriage return/line feed.

If the parity bit is set and the masked character ($7F) is less than or equal to a blank, then the numeric value of the negated character is used as the number of blanks to be inserted in the output stream. If the mask character is greater than a blank, then that character is output followed by one blank.

With the exception of control characters, each character increments the column counter by one. A **Backspace** ($08) decrements the counter while a ↵ ($0D) clears the counter. **Tabs** ($09) are expanded with blanks to MOD 8 character zone fields.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also: XPEL - Put Encoded Line To Console
XPLC - Put Line To Console
XPMC - Put Message To Console

Possible Errors: None

Example:

```
            XPEM    MES01   ;OUTPUT MESSAGE
            ....


MES01       DC.B    $80,'Lev',-2,'Name:ext'
            DC.B    -6,'Type',-6,'Size',-6
            DC.B    'Dat',-'e','created',-4
            DC.B    'Las',-'t','update',0

$80 = Carriage return/line feed
```

XPLC

Put Line to Console

Value: $A08A

Module: MPDOSK2

Syntax: XPLC

Registers: In (A1) = ASCII string

Description: The PUT LINE TO CONSOLE primitive outputs the ASCII character string pointed to by address register A1 to the user console and/or SPOOL file. The string is delimited by the null character.

With the exception of control characters and characters with the parity bit on, each character increments the column counter by one. A **Backspace** ($08) decrements the counter while a ↵ ($0D) clears the counter. **Tabs** ($09) are expanded with blanks to MOD 8 character zone fields.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also: XPEL - Put Encoded Line To Console
XPEM - Put Encoded Message To Console
XPMC - Put Message To Console

Possible Errors: None

Example:

```
            LEA.L   MES1(PC),A1     ;OUTPUT MESSAGE
            XPLC
            MOVE.L  NUMB(PC),D1     ;GET NUMBER
            XCBD                    ;CONVERT TO DECIMAL
            XPLC                    ;OUTPUT
            ....

NUMB        DS.L    1               ;NUMBER HOLDER
MES1        DC.B    $0A,$0D         ;MESSAGE #1
            DC.B    'ANSWER=',0
```

XPMC

Put Message to Console

Value: $A08C

Module: MPDOSK2

Syntax: XPMC <message>

Registers: None

Description: The PUT MESSAGE TO CONSOLE primitive outputs the ASCII character string pointed to by the message address word immediately following the PDOS call to the user console and/or SPOOL file. The address is a PC relative 16-bit displacement to the message. The output string is delimited by the null character.

With the exception of control characters and characters with the parity bit on, each character increments the column counter by one. A **Backspace** ($08) decrements the counter while a ↵ ($0D) clears the counter. **Tabs** ($09) are expanded with blanks to MOD 8 character zone fields.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also: XPEL - Put Encoded Line To Console
XPEM - Put Encoded Message To Console
XPLC - Put Line To Console

Possible Errors: None

Example:

```
XPMC    MES2    ;OUTPUT HEADER
        ....

MES2    DC.B    $0A,$0D ;HEADER MESSAGE
        DC.B    'PDOS REV 3.0',0
```

XPSC

Position Cursor

Value: $A08E

Module: MPDOSK2

Syntax: XPSC

Registers:

In D1.B = Row
D2.B = Column

Uses PSC$(A6) as lead characters.

Description:

The POSITION CURSOR primitive positions the cursor on the console terminal according to the row and column values in data registers D1 and D2. Register D1 specifies the row on the terminal and generally ranges from 0 to 23, with 0 being the top row. Register D2 specifies the column of the terminal and ranges from 0 to 79, with 0 being the left-hand column. Register D2 is also loaded into the column counter reflecting the true column of the cursor.

PSC$(A6)= B111 1111 0222 2222
B = 0 then $00 bias; =1 then $20 bias
0 = 0 send row first then column
1 send column then row
1 = 7 bits for first ASCII lead in character
2 = 7 bits for second ASCII lead in character

The XPSC primitive outputs either one or two leading characters followed by the row and column. The leading characters output by XPSC are located in PSC$(A6) of the task control block. These characters are transferred from the parent task to the spawned task during creation. The initial characters come from the BIOS module.

If the high bit is set in the PSC$.W then the row and column characters are biased by $20; otherwise, they have a zero bias. If the parity bit in the low order byte is zero, then the sending order is row/column; otherwise, it is reversed.

If PSC$ is zero or if the first byte equals $FF, then PDOS makes a call into the BIOS for custom position cursor with a $20 bias. The entry point is B_PSC beyond the BIOS table. If the high order byte of PSC$ is -1, PDOS makes a call into the BIOS at B_PSC beyond byte of PSC$ and executes the proper code depending on the value found in the low order byte.

The MTERM utility is used to change the position cursor codes. MTERM will not handle calls to the BIOS for custom position cursor.

See Also:

XCLS - Clear Screen
XRCP - Read Port Cursor Position
BIOS in *PDOS Developer's Reference Manual*

XPSC - Position Cursor

Possible Errors:

None

Example:

```
OUTM    MOVEQ.L #23,D1  ;POSITION TO BOTTOM
        CLR.L   D2      ;  OF SCREEN
        XPSC            ;POSITION
        XPMC    MES1    ;OUTPUT MESSAGE
        ....
```

XPSF

Position File

Value:

$A0DC

Module:

MPDOSF

Syntax:

XPSF
<status error return>

Registers:

In D1.W = File ID
D2.L = Byte position

A byte position equal to -1 positions to the end of the file.

Description:

The POSITION FILE primitive moves the file byte pointer to any byte position within a file. The file ID is given in register D1 and the long word byte position is specified in register D2.

An error occurs if the byte position is greater than the current end-of-file marker.

A contiguous file greatly enhances the speed of the position primitive since the desired sector is directly computed. However, the position primitive does work with non-contiguous files, as PDOS follows the sector links to the desired byte position.

A contiguous file is extended by positioning to the end-of-file marker and writing data. However, PDOS will alter the file type to non-contiguous if a contiguous sector is not available. This would result in random access being much slower.

See Also:

XRFP - Read File Position
XRWF - Rewind File

Possible Errors:

52 = File Not Open
59 = Bad File Slot
70 = Position EOF
Disk errors

Example:

```
            MOVE.W  D5,D1       ;GET FILE ID
            MOVE.W  RN(A0),D2   ;GET RECORD #
            MULU.W  #36,D2      ;GET BYTE INDEX
            XPSF                ;POSITION WITHIN FILE
              BNE.S ERROR
            ....

RN          DS.W    1           ;RECORD #
```

XPSP

Put Space to Console

Value: $A098

Module: MPDOSK2

Syntax: XPSP

Registers: None

Description: The PUT SPACE TO CONSOLE outputs a **Space** ($20) character to the user console. There are no registers or status involved.

If there are coinciding bits in the unit (UNT$(A6)) and spool unit (SPU$(A6)) variables of the TCB, then the processed characters are written to the spool unit file slot (SPI$(A6)) and are not sent to the corresponding output ports. If a disk error occurs in the spool file, then all subsequent output characters echo as a bell until the error is corrected by selecting a different UNIT or resetting the SPOOL UNIT.

See Also: XPCC - Put Character(s) To Console

Possible Errors: None

Example:

```
        MOVEQ.L #N,D1    ;GET NUMBER
        XCBM    MES01    ;CONVERT
        XPLC             ;OUTPUT LINE
        XPSP             ;OUT SPACE
```

XRBF

Read Bytes From File

Value:

$A0DE

Module:

MPDOSF

Syntax:

XRBF
<status error return>

Registers:

In D0.L = Number of bytes
D1.W = File ID
(A2) = R/W buffer address
Out D3.L = Number of bytes read
(On EOF only)

Description:

The READ BYTES FROM FILE primitive reads the number of bytes specified in register D0 from the file specified by the file ID in register D1 into a memory buffer pointed to by address register A2. If the channel buffer has been rolled to disk, the least-used buffer is freed and the desired buffer is restored to memory. The file slot ID is placed on the top of the last-access queue.

If an error occurs during the read operation, the error return is taken with the error number in register D0 and the number of bytes actually read in register D3.

The read is independent of the data content. The buffer pointer in register A2 is on any byte boundary. The buffer is not terminated with a null.

A byte count of zero in register D0 results in one byte being read from the file. This facilitates single byte data acquisition.

See Also:

XRLF - Read Line From File
XWBF - Write Bytes To File
XWLF - Write Line To File

Possible Errors:

52 = File Not Open
56 = End Of File
59 = Bad File Slot
Disk errors

Example:

```
        MOVE.L  #256,D0 ;READ 256 BYTES
        MOVE.W  D5,D1   ;GET FILE ID
        MOVEA.L A6,A2   ;READ INTO USER BUF
        XRBF            ;READ DATA
          BNE.S ERROR
        ....

ERROR   CMPI.W  #56,D0  ;EOF?
          BNE.S ERROR2  ;N
        MOVE.L  D3,D0   ;Y, GET # OF BYTES READ
        ....
```

XRCN

Reset Console Inputs

Value: $A0B2

Module: MPDOSF

Syntax: XRCN

Registers: None

Description: The RESET CONSOLE INPUTS closes the current procedure file. If there are other procedure files pending (nested), then they become active again.

See Also: XCBC - Check For Break Character

Possible Errors: None

Example:

```
DONE    XRCN            ;CLOSE FILES
```

XRCP

Read Port Cursor Position

Value: $A092

Module: MPDOSK2

Syntax: XRCP

Registers:

In D0.W = Port #
Out D1.L = Row
D2.L = Column

If D0.W=0, then the current port (PRT$(A6)) is used.

Description: The READ PORT CURSOR POSITION primitive reads the current cursor position for the port designated by data register D0.B. The PDOS system maintains a column count (0-79) and a row count (0-23) for each port. When the cursor reaches row 23, the count is not incremented, acting like a screen scroll.

See Also: XCLS - Clear Screen
XPSC - Position Cursor

Possible Errors: None

Example:

```
MOVEQ.L #1,D0    ;LOOK AT PORT 1
XRCP             ;READ POSITION
SWAP    D1
MOVE.W  D2,D1    ;D1.L=Y/X POSITION
```

XRDE

Read Next Directory Entry

Value:

$A0A6

Module:

MPDOSF

Syntax:

XRDE
<status error return>

Registers:

In D0.B = Disk number
D1.B = Read flag (0=1st)
(A2) = Last 32 byte directory entry
TW1$ = Sector number
TW2$ = number of directory entries

Out D1.W = Sector number
(A2) = Next entry

Description:

The READ NEXT DIRECTORY ENTRY primitive reads sequentially through a disk directory. If register D1.B is zero, then the routine begins with the first directory entry. If register D1.B is nonzero, then based on the last directory entry (pointed to by register A2), the next entry is read.

The calling routine must maintain registers D0.B and A2, the user I/O buffer, and temporary variables TW1$ and TW2$ of the task control block between calls to XRDE.

Possible Errors:

53 = File Not Defined (end of directory)
68 = Not PDOS Disk
Disk errors

Example:

```
START   MOVEQ.L #0,D1      ;BEGIN WITH 1ST ENTRY
        BRA.S   LOOP02
*
LOOP    MOVEQ.L #-1,D1     ;READ NEXT ENTRY
*
LOOP02  MOVE.W  D5,R0      ;GET DISK #
        XRDE               ;READ DIRECTORY ENTRY
          BNE.S ERROR      ;ERROR
        MOVE.B  12(A2),R4  ;GET FILE TYPE
        ....
```

XRDM

Dump Registers

Value: $A02A

Module: MPDOSK1

Syntax: XRDM

Registers: In All

Description: The DUMP REGISTERS primitive formats and outputs all the current register values of the 68000 to the user console along with the program counter, status register, and the supervisor stack. It also outputs the VBR register on 68010/20 systems.

The registers and status are not affected by this primitive.

See Also: XBUG - Debug Call
XDMP - Dump Memory From Stack
PDOS Monitor, Editor, Utilities manual

Possible Errors: None

Example:

```
MOVEM.L RL,(A7)+ ;RESTORE REGISTERS
XRDM             ;DUMP RESULTS
```

XRDN

Read Directory Entry by Name

Value:

$A0A8

Module:

MPDOSF

Syntax:

XRDN
<status error return>

Registers:

In D0.B = Disk number
MWB$ = File name
Out D1.W = Sector number in memory
(A2) = Directory entry
TW2$ = Entry count

Description:

The READ DIRECTORY ENTRY BY NAME primitive reads directory entries by file name. Register D0.B specifies the disk number. The file name is located in the Monitor Work Buffer (MWB$) in a fixed format. Several other parameters are returned in the monitor TEMP storage of the user task control block. These variables assist in the housekeeping operations on the disk directory.

See Also:

XFFN - Fix File Name

Possible Errors:

53 = File Not Defined
68 = Not PDOS Disk
Disk errors

Example:

```
OPENF   LEA.L   FN(PC),A1 ;GET FILE NAME POINTER
        XFFN              ;FIX NAME IN MWB
          BNE.S ERROR     ;ERROR
        XRDN              ;READ DIRECTORY ENTRY
          BNE.S ERROR     ;ERROR
        ....
```

XRDT

Read Date

Value: $A05C

Module: MPDOSK3

Syntax: XRDT

Registers: Out (A1) = 'MN/DY/YR'<null>

Description: The READ DATE primitive returns the current system date as a nine character string. The format is"MN/DY/YR" followed by a null. Address register A1 points to the string in the monitor work buffer.

See Also:
XFTD - Fix Time And Date
XPAD - Pack ASCII Date
XRTM - Read Time
XUAD - Unpack ASCII Date
XUDT - Unpack Date
XUTM - Unpack Time

Possible Errors: None

Example:

```
GETD    XPMC    MES1    ;OUTPUT PROMPT
        XRDT            ;GET DATE
        XPLC            ;OUTPUT TO SCREEN
        ....

MES1    DC.B    'DATE=',0
```

XRFA

Read File Attributes

Value:

$A0E0

Module:

MPDOSF

Syntax:

XRFA
<status error return>

Registers:

In (A1) = File name
Out (A2) = Directory entry
D0.L = Disk number
D1.L = File size (in bytes)
D2.L = Level/attributes

Uses multiple directory file search.

Description:

The READ FILE ATTRIBUTES primitive returns the disk number of where the file was found in data register D0.L. Data register D1.L is returned with the size of the file in bytes. The file directory level is returned in the upper word of register D2.L and the file attributes are returned in register D2.W. The file name is pointed to by address register A1. File attributes are defined as follows:

```
$80xx   AC - Procedure file
$40xx   BN - Binary file
$20xx   OB - 68000 object file
$10xx   SY - 68000 memory image
$08xx   BX - BASIC binary token file
$04xx   EX - BASIC ASCII file
$02xx   TX - Text file
$01xx   DR - System I/O driver

$xx04   C  - Contiguous file
$xx02   *  - Delete protect
$xx01   ** - Delete and write protect
```

See Also:

XCFA - Close File With Attribute
XWFA - Write File Attributes
XWFP - Write File Parameters

Possible Errors:

50 = Bad File Name
53 = File Not Defined
60 = File Space Full
Disk errors

Example:

```
            LEA.L   FN(PC),A1 ;GET FILE NAME
            XRFA             ;READ FILE ATTRIBUTES
              BNE.S ERROR    ;PROBLEM
            LRL.W   #2,D2    ;BINARY FILE?
              BCC.S PNO      ;N
            ....             ;Y


FN          DC.B    'PRGM:BIN',0
            EVEN
```

XRFP

Read File Position

Value:

$A0FE

Module:

MPDOSF

Syntax:

XRFP
<status error return>

Registers:

In D1.W = File ID
Out (A3) = File slot address
D2.L = Byte position
D3.L = EOF byte position

Description:

The READ FILE POSITION primitive returns the current file position, end-of-file position, and file slot address. The open file is selected by the file ID in data register D1.W.

Address register A3 is returned pointing to the open file slot. Data registers D2.L and D3.L are returned with the current file byte position and the end-of-file position respectively.

See Also:

XPSF - Position File
XRWF - Rewind File

Possible Errors:

52 = File Not Open
59 = Bad File Slot
Disk errors

Example:

```
MOVE.W  D5,D1      ;GET FILE ID
XRFP               ;READ FILE POSITION
  BNE.S ERROR
....
```

XRLF

Read Line From File

Value:

$A0E2

Module:

MPDOSF

Syntax:

XRLF
<status error return>

Registers:

In D1.W = File ID
(A2) = R/W buffer address
Out D3.L = # of bytes read
(On EOF only)

Description:

The READ LINE primitive reads one line, delimited by a carriage return ↵, from the file specified by the file ID in register D1. If a ↵ is not encountered after 132 characters, then the line and primitive are terminated. Address register A2 points to the buffer in user memory where the line is to be stored. If the channel buffer has been rolled to disk, the least-used buffer is freed and the buffer is restored to memory. The file slot ID is placed on the top of the last-access queue.

If an error occurs during the read operation, the error return is taken with the error number in register D0 and the number of bytes actually read in register D3.

The line read is dependent upon the data content. All line feeds (↓) are dropped from the data stream and the ↵ is replaced with a null. The buffer pointer in register A2 may be on any byte boundary. The buffer is not terminated with a null on an error return.

See Also:

XRBF - Read Bytes From File
XWBF - Write Bytes To File
XWLF - Write Line To File

Possible Errors:

52 = File Not Open
56 = End of File
59 = Bad File Slot
Disk errors

Example:

```
            MOVE.W  D5,D1       ;GET FILE ID
            LEA.L   BF(PC),A2   ;GET BUFFER POINTER
            XRLF                ;READ LINE
              BNE.S ERROR
            ....


BF          DS.B    132         ;MAXIMUM BUFFER NEEDED
```

XRNF

Rename File

Value:

$A0E4

Module:

MPDOSF

Syntax:

XRNF
<status error return>

Registers:

In (A1) = Old file name
(A2) = New file name or level number

Description:

The RENAME FILE primitive renames a file in a PDOS disk directory. The old file name is pointed to by address register A1. The new file name or level is pointed to by address register A2.

The XRNF primitive is used to change the directory level for any file by letting the new file name be a numeric string equivalent to the new directory level. XRNF first attempts a conversion on the second parameter before renaming the file. If the string converts to a number without error, then only the level of the file is changed.

See Also:

XDFL - Define File
XDLF - Delete File

Possible Errors:

50 = Bad File Name
51 = File Already Defined
Disk errors

Example:

```
            LEA.L   F1(PC),A1 ;GET OLD FILE NAME
            LEA.L   F2(PC),A2 ;GET NEW FILE NAME
            XRNF              ;RENAME FILE
              BNE.S ERROR     ;PROBLEM
            MOVEA.L A2,A1     ;POINT TO NEW NAME
            LEA.L   LV(PC),A2 ;GET NEW LEVEL
            XRNF              ;CHANGE DIRECTORY LEVEL
              BNE.S ERROR
            ....


LV          DC.B    '10',0
F1          DC.B    'OBJECT:OLD',0
F2          DC.B    'OBJECT:NEW',0
            EVEN
```

XROO

Open Random Read Only File

Value:

$A0E6

Module:

MPDOSF

Syntax:

XROO
<status error return>

Registers:

In (A1) = File name
Out D0.W = File attribute
D1.W = File ID

☞ Uses multiple directory file search.

Description:

The OPEN RANDOM READ ONLY FILE primitive opens a file for random access by assigning the file to an area of system memory called a file slot, and returning a file ID and file attribute to the calling program. Thereafter, the file is referenced by the file ID and not by the file name. This type of file open provides read only access.

The file ID (returned in register R1) is a 2-byte number. The left byte is the disk number and the right byte is the channel buffer index. The file attribute is returned in register D0.

D1.W = (Disk #) x 256 + (File slot index)
D0.W = (ABOS BETD xxxx xCWD)

Since the file cannot be altered, it cannot be extended nor is the LAST UPDATE parameter changed when it is closed. All data transfers are buffered through a channel buffer and data movement to and from the disk is by full sectors.

A new file slot is allocated for each XROO call even if the file is already open. The file slot is allocated beginning with slot 1 to 32.

Possible Errors:

50 = Bad File Name
53 = File Not Defined
61 = File Already Open
68 = Not PDOS Disk
69 = Out of File Slots
Disk errors

Example:

```
            LEA.L   HLPFN(PC),A1 ;POINT TO FILE NAME
            XROO                ;OPEN FILE
              BNE.S ERROR
*
HELP02      MOVEA.L A6,A2       ;GET BUFFER
            XRLF                ;READ LINE
              BNE.S SHWF22
            ....
HLPFN       DC.B    'HLPTX',0
```

XROP

Open Random File

Value:

$A0E8

Module:

MPDOSF

Syntax:

XROP
<status error return>

Registers:

In (A1) = File name
Out D0.W = File attribute
D1.W = File ID

Uses multiple directory file search.

Description:

The OPEN RANDOM FILE primitive opens a file for random access by assigning the file to an area of system memory called a file slot, and returning a file ID and file attribute to the calling program. Thereafter, the file is referenced by the file ID and not by the file name.

D0.W = (ABOS BETU xxxx xCWD)
D1.W = (Disk #) x 256 + (File slot index)

The file ID (returned in register D1) is a 2-byte number. The left byte is the disk number and the right byte is the channel buffer index. The file attribute is returned in register D0.

The END-OF-FILE marker on a random file is changed only when the file has been extended. All data transfers are buffered through a channel buffer and data movement to and from the disk is by full sectors.

The file slot is allocated beginning with slot 32 to slot 1. If the file is already open, then the file slot is shared.

Possible Errors:

50 = Bad File Name
53 = File Not Defined
61 = File Already Open
68 = Not PDOS Disk
69 = Out of File Slots
Disk errors

Example:

```
            LEA.L   FN(PC),A1 ;GET FILE NAME
            XROP             ;OPEN RANDOM FILE
              BNE.S ERROR    ;ERROR
            MOVE.W  D0,D5    ;SAVE TYPE
            SWAP    D5
            MOVE.W  D1,D5    ;SAVE FILE ID
            ....

FN          DC.B    'FILENAME:EXT',0
            EVEN
```

XRPS

Read Port Status

Value:

$A094

Module:

MPDOSK2

Syntax:

XRPS
<status error return>

Registers:

In D0.W = Port number
Out D1.L = ACI$.W / portflag.B / Status.B

If D0.W=0, then the current port (PRT$(A6)) is used.

Description:

The READ PORT STATUS primitive reads the current status of the port specified by data register D0.W. The high order word of data register D1.L is returned zero if no procedure file is open. Otherwise, it is returned with ACI$.

The low order word is returned with the port flag bits and the status as returned for the port UART routine. The flag bits indicate if eight bit I/O is occurring, if DTR or **Ctrl S Ctrl Q** protocol is in effect, and other flags.

```
portflag. = fwpi 8dcs
              \\\\ \\\\_ 0 = Ctrl S Ctrl Q enable
               \\\\ \\\_ 1 = Ignore control character
                \\\\ \\_ 2 = DTR enable
                 \\\\ \_ 3 = 8-bit character enable
                  \\\\__ 4 = Receiver interrupt disable
                   \\\__ 5 = Even parity enable
                    \\__ 6 = (Reserved)
                     \__ 7 = (Reserved)
```

See Also:

XBCP - Baud Console Port
XSPF - Set Port Flag

Possible Errors:

66 = Bad Port/Baud Rate

Example:

```
        MOVEQ.L #0,D0    ;LOOK AT CURRENT PORT
        XRPS
          BNE.S ERROR
        BTST.B  #0,D1    ;^S^Q?
          BNE.S CSCQ     ;Y
```

XRSE

Read Sector

Value: $A0C2

Module: MPDOSF

Syntax:
XRSE
<status error return>

Registers:
In D0.B = Disk number
D1.W = Sector number
(A2) = Buffer pointer

Description:
The READ SECTOR primitive calls a system-defined, hardware-dependent program which reads 256 bytes of data into a memory buffer pointed to by address register A2. The disk is selected by data register D0. Register D1 specifies the logical sector number to be read.

See Also:
BIOS in *PDOS Developer's Reference Manual*
XISE - Initialize Sector
XRSZ - Read Sector Zero
XWSE - Write Sector

Possible Errors:
Disk errors

Example:

```
            CLR.W   D0              ;SELECT DISK #0
            MOVEQ.L #2,D1           ;SELECT SECTOR 2
            LEA.L   BUFF(PC),A2     ;POINT TO BUFFER
            XRSE                    ;READ INTO BUFFER
              BNE.S XERR            ;ERROR
            ....
XERR        XERR                    ;DISK ERROR
BUFFER      DS.B    256             ;BUFFER
```

XRSR

Read Status Register

Value: $A042

Module: MPDOSK1

Syntax: XRSR

Registers: Out D0.W = 68000 status register

Description: The READ STATUS REGISTER primitive allows you to read the 68000 status register. Of course, this is equivalent to the"MOVE.W SR,Dx" instruction on the 68000. However, this instruction is privileged on the 68010 and 68020. Hence, it is advisable to use the XRSR primitive to read the status register to make software upward compatible.

See Also: XLSR - Load Status Register
XSUP - Enter Supervisor Mode
XUSP - Return to User Mode

Possible Errors: None

Example:

```
        XRSR            ;READ SR
        ANDI.W  #$0700,D0
```

XRST

Reset Disk

Value: $A0B4

Module: MPDOSF

Syntax: XRST

Registers:

In D1.W =-1.... Reset by task
>=0... Reset by disk

Description:

The RESET DISK primitive closes all open files either by task or disk number. The primitive also clears the assigned input file ID. If register D1 equals -1, then all files associated with the current task are closed. Otherwise, register D1 specifies a disk and all files opened on that disk are closed.

XRST has no error return and as such, closes all files even though errors occur in the close process. This is necessary to allow for recovery from previous errors.

See Also:

XCFA - Close File With Attribute
XCLF - Close File

Possible Errors:

None

Example:

```
DONE    MOVEQ.L #-1,D1   ;CLOSE ALL TASK FILES
        XRST
        ....

        MOVE.W  D5,D1    ;PREPARE TO REMOVE DISK
        XRST             ;CLOSE ALL FILES
        ....             ;REMOVE DISK
```

XRSZ

Read Sector Zero

Value:

$A0C4

Module:

MPDOSF

Syntax:

XRSZ
<status error return>

Registers:

In D0.B = Disk number
Out D1.L = 0
(A2) = User buffer pointer (A6)

Description:

The READ SECTOR ZERO primitive is a system-defined, hardware-dependent program which reads 256 bytes of data into the user memory buffer (usually pointed to by address register A6). The disk is selected by data register D0.W. Register D1.L is cleared and logical sector zero is read.

See Also:

BIOS in *PDOS Developer's Reference Manual*
XISE - Initialize Sector
XRSE - Read Sector
XWSE - Write Sector

Possible Errors:

Disk errors

Example:

```
MOVEQ.L #1,D0    ;SELECT DRIVE 1
XRSZ             ;READ HEADER
  BNE.S ERROR
XPBC             ;PRINT DISK NAME
```

XRTE

Return From Interrupt

Value: $A044

Module: MPDOSK1

Syntax: XRTE

Registers:

In SSP = Status register.W
Program counter.L

Description:

The RETURN FROM INTERRUPT primitive is used to return from an interrupt process routine with a context switch. This allows an immediate rescheduling of the highest priority ready task which may be suspended pending the occurrence of an event set by the interrupt routine. It also allows a return from an interrupt to awaken a specific task regardless of higher priority tasks. To signal XRTE to return to a specific task, the interrupt routine sets the task number into byte TQUX.(A5) in the system SYRAM.

If the interrupted system is locked when the XRTE primitive is executed, then the reschedule flag (RFLG.(A5)) is cleared and a return from exception instruction (RTE) is executed. When the system clears the task lock, RFLG. is tested and set (TAS) and a rescheduling occurs at that time.

Possible Errors: None

Example:

```
....                ;PROCESS INTERRUPT
MOVEQ.L #66,D1
XSEV                ;SET EVENT 66
XRTE                ;RETURN FROM INTERRUPT
```

XRTM

Read Time

Value: $A05E

Module: MPDOSK3

Syntax: XRTM

Registers:

Out (A1) = 'HR:MN:SC'<null>
10(A1).W = Tics/second (B.TPS)
12(A1).L = Tics (TICS.)

Description: The READ TIME primitive returns the current time as a nine-character string. The format is"HR:MN:SC" followed by a null. Address register A1 points to the string in the monitor work buffer.

See Also:

XFTD - Fix Time And Date
XPAD - Pack ASCII Date
XRDT - Read Date
XUAD - Unpack ASCII Date
XUDT - Unpack Date
XUTM - Unpack Time

Possible Errors: None

Example:

```
GETD    XPMC    MES1    ;OUTPUT PROMPT
        XRTM            ;GET TIME
        XPLC            ;OUTPUT TO SCREEN
        ....

MES1    DC.B    'TIME=',0
```

XRTP

Read Time Parameters

Value: $A034

Module: MPDOSK1

Syntax: XRTP

Registers:

Out D0.L = TICS.
D1.L = MONTH/DAY/YEAR/0
D2.L = HOURS/MINUTES/SECONDS/0
D3.L = B.TPS

Description:

The READ TIME PARAMETERS primitive returns the current time parameters. Data register D0 returns with the current tic count (TICS.(A5)). Register D1.L returns with the current date and register D2.L the current time. Both are three bytes that are left-justified. Finally, data register D3.L returns with the number of clock tics per second.

See Also:

XFTD - Fix Time And Date
XPAD - Pack ASCII Date
XRDT - Read Date
XRTM - Read Time
XUAD - Unpack ASCII Date
XUDT - Unpack Date
XUTM - Unpack Time

Possible Errors:

None

XRTS

Read Task Status

Value:

$A012

Module:

MPDOSK1

Syntax:

XRTS
<status return>

Registers:

In D0.W = Task number
Out D1.L = 0 - Not executing
= +N - Time slice
= -N - (Event #1/Event #2)
A0.L = TLST entry (IF -D0: A0=TLST.)
SR = Status of D1.L

If D0.W=-1, then the current task number is returned in D1.L.

Description:

The READ TASK STATUS primitive returns in register D1 and the status register returns the time parameter of the task specified by register D0. The time reflects the execution mode of the task. If D1 returns zero, then the task is not in the task list. If D1 returns a value greater than zero, then the task is in the run state (executing). If D1 returns a negative value, then the task is suspended pending event -(D1).

The task number is returned from the CREATE TASK BLOCK (XCTB) primitive. It can also be obtained by setting data register D0 equal to a minus one. In this case, register D1.L is returned with the current task number.

See Also:

XSTP - Set/Read Task Priority

Possible Errors:

None

Example:

```
WAIT    MOVEQ.L #2,D0   ;WAIT TO TASK 0
        XRST            ; TO DIE
          BNE.S WAIT    ;STILL GOING
        ...             ;DONE
```

XRWF

Rewind File

Value: $A0EA

Module: MPDOSF

Syntax:
XRWF
<status error return>

Registers: In D1.W = File ID

Description: The REWIND FILE primitive positions the file specified by the file ID in register D1, to byte position zero.

See Also:
XPSF - Position File
XRFP - Read File Position

Possible Errors:
52 = File Not Open
59 = Bad File Slot
Disk errors

Example:

```
REWIND  MOVE.W  D5,D1    ;GET FILE ID
        XRWF             ;REWIND FILE
          BNE.S ERROR    ;PROBLEM
        ....
```

XSEF

Set Event Flag With Swap

Value:

$A018

Module:

MPDOSK1

Syntax:

XSEF
<status return>

Registers:

In D1.B = Event (+=Set(1), -=Clear(0))
Out SR = NE....Set
EQ....Clear

An XSWP is automatically executed after the event is set or cleared. Event 128 is local to each task.

If D1.B is positive, then the event is set.

If D1.B is negative, then the event is cleared.

Description:

The SET EVENT FLAG WITH SWAP primitive sets or clears an event flag bit. The event number is specified in data register D1.B and is modulo 128. If the content of register D1.B is positive (1 to 127, $01 to $7F), then the event bit is set (1). If D1.B is negative (-1 to -127, $FF to $81), the bit is cleared (=0). Event 128 can only be cleared. (It is set by the delay event list.)

If the event is 128 ($80) then the task's local event is cleared. Event zero ($00) is illegal to use. The status of the event bit prior to changing the event is returned in the status register. If the event was cleared, then the"EQ" status is returned; otherwise, if the event was set, then a "NE" status is returned. Also, an immediate context switch occurs thus scheduling any higher priority task pending on that event.

```
Four types of event flags:
       1-63    = Software
      64-80    = Software self clearing
     81-127    = System
        128    = Local to task
```

```
Events are summarized as follows:
          1-63= Software events
         64-80= Software self clearing events
         81-95= Output port events
        96-111= Input port events
           112= 1/5 second event
           113= 1 second event
           114= 10 second event
           115= 20 second event
           116= TTA active
           117=
           118= Printer
           119= Disk
           120= Level 2 lock
           121= Level 3 lock
           122= Batch event
           123= Spooler event
           124=
           125=
           126= Error message disable
           127= System utility
           128= Local
```

See Also:

XDEV - Delay Set/Clear Event
XSEV - Set Event Flag
XSUI - Suspend Until Interrupt
XTEF - Test Event Flag

Possible Errors:

None

Example:

```
MOVEQ.L #30,D1  ;SET EVENT 30
XSEF            ;SET EVENT
....

MOVEQ.L #-35,D1 ;CLEAR EVENT 35
XSEF            ;SET EVENT
....
```

XSEV

Set Event Flag

Value:

$A046

Module:

MPDOSK1

Syntax:

XSEV
<status return>

Registers:

In D1.B = Event (+=Set(1), -=Clear(0))
Out SR = NE....Set
EQ....Reset

Event 128 is local to each task.

If D1.B is positive, then the event is set.

If D1.B is negative, then the event is reset.

Description:

The SET EVENT FLAG primitive sets or clears an event flag bit. The event number is specified in data register D1.B and is modulo 128. If the content of register D1.B is positive (1 to 127, $01 to $7F), then the event bit is set (=1). If D1.B is negative (-1 to -127, $FF to $811), the bit is cleared (=0). Event 128 can only be cleared. (It is set by the delay event list.) Event zero ($00) is illegal to use. If the event is 128 ($80) then the task's local event is cleared. The status of the event bit prior to changing the event is returned in the status register. If the event was cleared, then the"EQ" status is returned; otherwise, if the event was set, then a "NE" status is returned. A context switch DOES NOT occur with this call making it useful for interrupt routines outside the PDOS system.

```
      Four types of event flags:
          1-63       = Software
         64-80       = Software self clearing
        81-127       = System
           128= Local to task

Events are summarized as follows:
           1-63= Software events
          64-80= Software self clearing events
          81-95= Output port events
         96-111= Input port events
        112-115= Timer events
        116-127= System control events
           128= Local
```

See Also:

XDEV - Delay Set/Reset Event
XSEV - Set Event Flag
XSUI - Suspend Until Interrupt
XTEF - Test Event Flag

Possible Errors:

None

Example:

```
MOVEQ.L #30,D1  ;SET EVENT 30
XSEV            ;SET EVENT
....

MOVEQ.L #-35,D1 ;CLEAR EVENT 35
XSEV            ;SET EVENT
....
```

XSMP

Send Message Pointer

Value:

$A002

Module:

MPDOSK1

Syntax:

XSMP
<status return>

Registers:

In D0.B = Message slot number (0..15)
(A1) = Message
Out SR = EQ....Message sent (Event[64+slot #]=1)
NE....No message sent
D0.L = Error number 62 if message pointer error

Description:

The SEND MESSAGE POINTER primitive sends a 32-bit message to the message slot specified by data register D0.B. Address register A1 contains the message.

If there is still a message pending, then the primitive immediately returns with status set"Not Equal" and D0.L returns the error number 62. Otherwise, the message is taken by PDOS event (64 + message slot number) is set (=1) indicating a message is ready, and status is returned"Equal".

The primitive XSMP is only valid for message slots 0 through 15. (This is because of current event limitations.)

See Also:

XGMP - Get Message Pointer
XGTM - Get Task Message
XKTM - Kill Task Message
XSTM - Send Task Message

Possible Errors:

62 = Bad Message Ptr Call

Example:

```
        . . .
        LEA.L   MESS(PC),A1     ;LOAD ADDRESS OF MESS INTO A1
AGAIN   MOVE.B  #5,D0           ;POINT TO MESSAGE SLOT #5
        XSMP                    ;SEND MESSAGE TO SLOT 5
          BEQ.S AROUND          ;MESSAGE SENT
        XWSP                    ;MESSAGE PENDING, SO WAIT AWHILE
          BRA.S AGAIN           ;RETRY
AROUND  . . .
MESS    DC.B    $0A,$0D,'HELLO PDOS USERS',0
```

XSOE

Suspend on Physical Event

Value: $A112

Module: MPDOSK1

Syntax: XSOE

Registers:

In D1.L = Event 1 Descriptor.w,Event 0 Descriptor.w
A0 = Event 0 address (0=no event 0 to suspend on)
A1 = Event 1 address (0=no event 1 to suspend on)
Out D0.L = -1 if awaken on event 0; 1 if awaken on event 1

This call is the same as XSUI but with physical events.

Description:

XSOE allows a task to suspend on one or two events within the system. Tasks that suspend on physical events are listed as suspended on events -1/1. If event 0 is the scheduling event, a -1 is returned; otherwise, a 1 is returned.

The event descriptor is a 16-bit word that defines both the bit number at the specified A0,A1 address and the action to take on the bit. The following bits are defined:

```
Bit number -- 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
               T x   x  x  x  x x x S x x x x B B B

      T = Should the bit be toggled on scheduling?
            1=Yes (toggle), 0=No (do not toggle)
      S = Suspend on event bit clear or set
            1=Suspend on SET, 0=Suspend on CLEAR
      BBB = The 680x0 bit number to use as an event
      x = Reserved, should be 0.
```

Since the bit number is specified in the lower three bits of the descriptor, you may use the descriptor with the 680x0 BTST, BCLR, BSET instructions.

See Also:

XDPE - Delay On Physical Event
XTLP - Translate Logical To Physical Event

Example:

```
        . . .
        MOVE.L    #$80800081,D1   ;SET DESCRIPTORS
        LEA.L     PEV(PC),A0      ;GET PEV ADDRESS
        MOVEA.L   A0,A1           ;COPY FOR EV1
        MOVE.L    #100,D0         ;SET TIMEOUT
        BCLR.B    D0,(A1)         ;CLEAR TIMEOUT EV0
        XDPE                      ;START TIMER
        XSOE                      ;SUSPEND
        . . .
PEV     DC.W      0
```

XSOP

Open Sequential File

Value:

$A0EC

Module:

MPDOSF

Syntax:

XSOP
<status error return>

Registers:

In (A1) = File name
Out D0.W = File attribute
D1.W = File ID

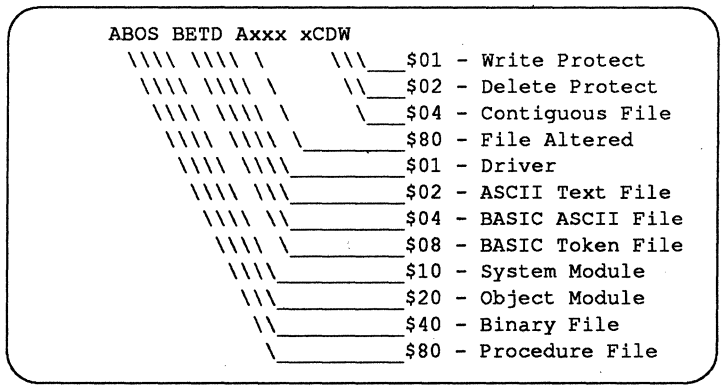
Uses multiple directory file search.

Description:

The OPEN SEQUENTIAL FILE primitive opens a file for sequential access by assigning the file to an area of system memory called a file slot and returning a file ID and file type to the calling program. Thereafter, the file is referenced by the file ID and not by the file name.

The file ID (returned in register D1) is a 2-byte number. The left byte is the disk number and the right byte is the file slot index. The file attribute is returned in D0.

D0.W = (ABOS BETD xxxx xCDW)
D1.W = (Disk #) x 256 + (File slot index)



The END-OF-FILE marker on a sequential file is changed whenever data is written to the file. All data transfers are buffered through a channel buffer; data movement to and from the disk is by full sectors.

The file slots are allocated beginning with slot 32 down to slot 1.

Possible Errors:

50 = Bad File Name
53 = File Not Defined
61 = File Already Open
68 = Not PDOS Disk
69 = Out of File Slots
Disk errors

Example:

```
            LEA.L   FN(PC),A1 ;GET FILE NAME
            XSOP              ;OPEN SEQUENTIAL FILE
              BNE.S ERROR     ;ERROR
            MOVE.W  D0,D5     ;SAVE TYPE
            SWAP    D5
            MOVE.W  D1,D5     ;SAVE FILE ID
            ....

FN          DC.B    'FILENAME:EXT',0
            EVEN
```

XSPF

Set Port Flag

Value:

$A09A

Module:

MPDOSK2

Syntax:

XSPF
<status error return>

Registers:

In D0.W = Port number
D1.B = Port flag (fwpi8dcs)
Out D1.B = Old port flag

☞ If D0.W=0, then the current port (PRT$(A6)) is used.

Description:

The SET PORT FLAG primitive stores the port flag passed in data register D1.B in the port flag register as specified by register D0.W.

If flag bits"p","i", or"8" change, the BIOS baud port routine is called.

See Also:

XBCP - Baud Console Port
XRPS - Read Port Status

Possible Errors:

66 = Bad Port/Baud Rate

Example:

```
MOVEQ.L #0,D0    ;SELECT CURRENT
MOVEQ.L #1,D1    ;^S^Q
XSPF
```

XSTM

Send Task Message

Value:

$A020

Module:

MPDOSK1

Syntax:

XSTM
<status error return>

Registers:

In D0.B = TASK NUMBER
(A1) = MESSAGE

Description:

The SEND TASK MESSAGE primitive places a 64-character message into a PDOS system message buffer. The message is data-independent and is pointed to by address register A1.

Data register D0 specifies the destination of the message. If register D0 is negative, and there is no input port (phantom port), then the message is sent to the parent task. If there is a port, then the message is sent to itself and will appear at the next command line. Otherwise, register D0 specifies the destination task.

D0 = -1 sends message to parent task

The ability to direct a message to a parent task is very useful in background tasking. An assembler need not know from which task it was spawned and can merely direct any diagnostics to the parent task.

If the destination task number equals -1, the task message is moved to the monitor input buffer and parsed as a command line. This feature is used by the CREATE TASK BLOCK primitive to spawn a new task.

See Also:

XGMP - Get Message Pointer
XGTM - Get Task Message
XKTM - Kill Task Message
XSMP - Send Message Pointer
XSTM - Send Task Message

Possible Errors:

78 = Msg Buffer Full

Example:

```
TERR    LEA.L   ERRM(PC),A1     ;RETURN MESSAGE
        ST.B    D0              ;SEND TO PARENT
        XSTM                    ;SEND, ERROR?
          BNE.S ERROR           ;Y
        XEXT                    ;N, QUIT
```

XSTP

Set/Read Task Priority

Value:

$A03C

Module:

MPDOSK1

Syntax:

XSTP
<status error return>

Registers:

In D0.B = Task #
D1.W = Task time/Task priority
Out D1.B = Task priority (If D1.B was 0)

☞ If D0.B=-1, then select current task. If D1.B=0, then read task priority into D1.B.

Description:

The SET/READ TASK PRIORITY primitive either sets or reads the task priority selected by data register D0.B. If D1.B is nonzero, then the priority is set. Otherwise, it is read and returned in D1.B. If the upper byte of D1.W is non-zero, then the corresponding task time slice is also set.

See Also:

XRTS - Read Task Status

Possible Errors:

74 = Non-existent Task

Example:

```
MOVEQ.L #-1,D0  ;CURRENT TASK
MOVEQ.L #0,D1   ;SET TO READ
XSTP            ;READ TASK PRIORITY
  BNE.S ERROR
MOVE.B  D1,SV(A2)
....


MOVEQ.L #-1,D0  ;SELECT CURRENT
MOVEQ.L #100,D1 ;SET TO WRITE
XSTP            ;SET TASK PRIORITY
  BNE.S ERROR
```

XSUI

Suspend Until Interrupt

Value: $A01C

Module: MPDOSK1

Syntax: XSUI

Registers:

In D1.W = EV1/EV2
Out D0.L = Event

Description:

The SUSPEND UNTIL INTERRUPT primitive suspends the user task until one of the events specified in data register D1 occurs. A task can suspend until an event sets (positive event) or until it clears (negative event).

A task can suspend pending two different events. This is useful when combined with timeout counters to prevent system lockups. Data register D0.L is returned with the event which caused the task to be scheduled.

A suspended task does not receive any CPU cycles until one of the event conditions is met. When the event bit is set (or cleared), the task begins executing at the next instruction after the XSUI call. The task is scheduled during the normal swapping functions of PDOS according to its priority. Register D0.L is used to determined which event scheduled the task.

A suspended task is indicated in the LIST TASK (LT) command under the"Event" parameter. Multiple events are separated by a slash.

Events 64 through 128 toggle when they cause a task to move from the suspended state to the ready state. All others must be cleared by the event routine.

If a locked task attempts to suspend itself, the call polls the events until a successful return condition is met.

See Also:

XDEV - Delay Set/Clear Event
XDPE - Delay on Physical Event
XSEF - Set Event Flag With Swap
XSEV - Set Event Flag
XSOE - Suspend on Physical Event
XTEF - Test Event Flag

Possible Errors:

None

XSUI - Suspend Until Interrupt

Example:

```
GETC    XGCC                ;CHARACTER?
          BNE.S GETC2       ;Y
        MOVEQ.L #100,D0     ;N, GET DELAY
        MOVEQ.L #128,D1     ;USER LOCAL EVENT
        XDEV                ;DELAY 128 1 SECOND
          BNE.S GETC        ;FULL
        LSL.W   #8,D1       ;GET 128/(PORT+96)
        MOVE.B  #96,D1
        ADD.B   PRT$(A6),D1
        XSUI                ;SUSPEND
        CMP.B   D0,D1       ;CHARACTER EVENT?
          BEQ.S GETC        ;Y
```

XSUP

Enter Supervisor Mode

Value: $A02C

Module: MPDOSK1

Syntax: XSUP

Registers: None

Description: The ENTER SUPERVISOR MODE primitive moves your current task from user mode to supervisor mode. Take care not to crash the system since you would then be executing off the supervisor stack!

This primitive enables programs to access I/O addresses and use privileged instructions.

Exit to user mode by executing a"ANDI.W #$DFFF,SR" instruction or the XUSP primitive.

See Also: XLSR - Load Status Register
XRSR - Read Status Register
XUSP - Return To User Mode

Possible Errors: None

Example:

```
P1      EQU $FFFFCE01    ;I/O PORT
*
OUT     XSUP             ;ENTER SUPERVISOR
        MOVE.B  D0,P1    ;OUTPUT
        ANDI.W  #$DFFF,SR ;MOVE TO USER
        RTS              ;RETURN
```

XSWP

Swap to Next Task

Value: $A000

Module: MPDOSK1

Syntax: XSWP

Registers: None

Description: The SWAP TO NEXT TASK primitive relinquishes control to the PDOS task scheduler. The next ready task with the highest priority begins executing. (This may be to the same task if there is only one task or the task is the highest priority ready task.)

Possible Errors: None

Example:

```
LOOP    TST.B   TMEM     ;CONDITION MET?
          BEQ.S LOOP02   ;Y
        XSWP             ;N, SWAP WHILE WAITING
        BRA.S   LOOP
*
LOOP02  ....
```

XSZF

Get Disk Size

Value:

$A0B6

Module:

MPDOSF

Syntax:

XSZF
<status error return>

Registers:

In D0.B = Disk number
Out D5.L = Directory size/# of files
D6.L = Allotted/Used
D7.L = Largest/Free

Description:

The GET DISK SIZE primitive returns disk size parameters in data registers D5 through D7. Data register D5 returns the number of currently defined files in the low word along with the maximum number of files available in the directory in the high word.

The low order 16 bits of data register D6 (0-15) returns the total number of sectors used by all files. The high order 16 bits of D6 (16-31) returns the number of sectors allocated for file storage.

The low order 16 bits of data register D7 (0-15) is calculated from the disk sector bit map and reflects the number of sectors available for file allocation. The high order 16 bits of D7 (16-31) is returned with the size of the largest block of contiguous sectors. This is useful in defining large files.

Possible Errors:

68 = Not PDOS Disk
Disk errors

Example:

```
            CLR.L   D0          ;SELECT DISK #0
            XSZF                ;GET DISK SIZE
              BNE.S ERROR       ;ERROR
            CLR.L   D1
            MOVE.W  D7,D1
            XCBM    SPM1        ;OUTPUT FREE
            XPLC                ;PRINT
            SWAP    D7
            MOVE.W  D7,D1
            XCBM    SPM2        ;OUTPUT LARGEST
            XPLC                ;CONTIGUOUS BLOCK
            XTAB    20          ;TAB TO COLUMN 20
            MOVE.W  D6,D1
            XCBM    SPM3        ;OUTPUT USED
            XPLC                ;PRINT
            SWAP    D6
            MOVE.W  D6,D1
            XCBM    SPM4        ;OUTPUT ALLOCATED
            XPLC                ;PRINT
            XEXT
*
SPM1        DC.B    $0A,$0D,'FREE:',0
SPM2        DC.B    ',',0
SPM3        DC.B    'USED:',0
SPM4        DC.B    '/',0
            EVEN
```

XTAB

Tab to Column

Value: $A090

Module: MPDOSK2

Syntax: XTAB <column>

Registers: None

Description: The TAB TO COLUMN primitive positions the cursor to the column specified by the number following the call. Spaces are output until the column counter is greater than or equal to the parameter.

The first print column is zero. At least one space character will always be output.

Possible Errors: None

Example:

```
        XPMC    MES1    ;OUTPUT HEADER
        XTAB    30      ;MOVE TO COLUMN 30
        ....
```

XTEF

Test Event Flag

Value:

$A01A

Module:

MPDOSK1

Syntax:

XTEF
<status return>

Registers:

In D1.B = Event number (+=1-127, -=128)
Out SR = NE....Event set (1)
EQ....Event clear (0)

Description:

The TEST EVENT FLAG primitive sets the 68000 status word EQUAL or NOT-EQUAL depending upon the zero or nonzero state of the specified event flag. The flag is not altered by this primitive.

The event number is specified in data register D1 and is modulo 128. Event 128 is local to each task.

See Also:

XDEV - Delay Set/Clear Event
XSEF - Set Event Flag With Swap
XSEV - Set Event Flag
XSUI - Suspend Until Interrupt

Possible Errors:

None

Example:

```
MOVEQ.L #30,D1   ;EVENT 30
XTEF             ;TEST EVENT FLAG
  BNE.S EVENT    ;EVENT = .TRUE.
....             ;EVENT = .FALSE.
```

XTLP

Translate Logical to Physical Event

Value: $A110

Module: MPDOSK1

Syntax: XTLP

Registers:

In D1.W = Event 1.B,,Event 0.B
Out A0 = Event 0 address (0=no event 0 to suspend on)
A1 = Event 1 address (0=no event 1 to suspend on)
D1 = Event 1 Descriptor.w,Event 0 Descriptor.w

Description:

XTLP takes a PDOS logical event number and translates the event into a physical event. This call is used when a program needs to suspend on both a logical and a physical event. The logical event is first translated; then the XSOE call is used to suspend it.

A PDOS logical event is one of the 128 events maintained by the PDOS system in SYRAM.

```
Events are summarized as follows:
          1-63= Software events
         64-80= Software self clearing events
         81-95= Output port events
        96-111= Input port events
       112-115= Timer events
       116-127= System control events
           128= Local
```

The event descriptor is a 16-bit word that defines both the bit number at the specified A0,A1 address and the action to take on the bit. The following bits are defined:

```
Bit number -- 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
               T x   x  x  x  x x x S x x x x B B B

       T = Should the bit be toggled on scheduling?
             1=Yes (toggle), 0=No (do not toggle)
       S = Suspend on event bit clear or set
             1=Suspend on SET, 0=Suspend on CLEAR
       BBB = The 680x0 bit number to use as an event
       x = Reserved, should be 0.
```

Since the bit number is specified in the lower three bits of the descriptor, you may use the descriptor with the 680x0 BTST, BCLR, BSET instructions. You may also use the following physical manipulation calls which are macros for single assembly instructions. They are optimal as long as the values have already been placed in the correct registers. Physical events may need synchronization via the XTAS macro to avoid corruption. The macros are defined in the file PESMACS:SR.

XTLP - Translate Logical to Physical Event

XTST - Test Physical Event (replaces BTST D1,(A0))
XSET - Test and Set Physical Event (replaces BSET D1,(A0))
XCLR - Test and Clear Physical Event (replaces BCLR D1,(A0))

Input: D1.W - Event descriptor
A0 - Event address
Output: None
Status: EQ - the bit was clear (0)
NE - the bit was set (1)

The bottom three bits are evaluated as a bit number. The bit at the address is set and the previous value is returned in the Z bit of the status register.

XTAS - Test and Set Physical Event (Bit 7 atomic)

This macro replaces TAS (A0). The seventh bit at the address is set and the previous value is returned in the N bit of the status register.

Input: A0 - Event address
Output: None
Status: EQ - the bit was clear (0)
NE - the bit was set (1)

See Also:

XDPE - Delay On Physical Event
XSOE - Suspend On Physical Event

Example:

```
        . . .
        MOVE.L      #128,D1         ;GET LOGICAL EVENT
        MOVE.L      #100,D0         ;SET TIMEOUT
        XDEV                        ;START TIMER
        LSL.W       #8,D1           ;MAKE EVENT 1
        XTLP                        ;TRANSLATE TO PHYSICAL
        MOVE.W      #$8080,D1       ;BIT 0 SET AND TOGGLE
        LEA.L       PEV(PC),A0      ;GET PEV ADDRESS
        XSOE                        ;SUSPEND UNTIL BIT 0 OF
        . . .                       ;PEV IS A 1
PEV     DC.W        0
```

XUAD

Unpack ASCII Date

Value: $A036

Module: MPDOSK3

Syntax: XUAD

Registers:

In D1.W = (Year*16+Month)*32+Day
(YYYY YYYM MMMD DDDD)

Out (A1) = 'DY-MON-YR'<null>
(Outputs ??? for invalid months)

Description: The UNPACK ASCII DATE primitive returns a pointer in address register A1 to an ASCII date string. Data register D1.W contains the binary date [(Year*16+Month)*32+Day]. The format of the string is more exact than simple numbers separated by slashes.

XUAD does not check for a valid date and hence, strange strings could result. Invalid months are replaced by"???."

See Also:

XFTD - Fix Time and Date
XPAD - Pack ASCII Date
XRDT - Read Date
XRTM - Read Time
XUDT - Unpack Date
XUTM - Unpack Time

Possible Errors: None

XUDT

Unpack Date

Value: $A060

Module: MPDOSK3

Syntax: XUDT

Registers:

In D1.W = (Year * 16 + Month) * 32 + Day
Out (A1) = 'MN/DY/YR'<null>

Description:

The UNPACK DATE primitive converts a one-word encoded date into an eight-character string terminated by a null (nine characters total). Data register D1 contains the encoded date and returns with a pointer to the formatted string in address register A1. The output of the FIX TIME & DATE (XFTD) primitive is valid input to this primitive.

See Also:

XFTD - Fix Time and Date
XPAD - Pack ASCII Date
XRDT - Read Date
XRTM - Read Time
XUAD - Unpack ASCII Date
XUTM - Unpack Time

Possible Errors:

None

Example:

```
        XFTD            ;FIX TIME & DATE
        XUDT            ;UNPACK DATE
        XPLC            ;PRINT 'MN/DY/YR'
        ....
```

XULF

Unlock File

Value: $A0EE

Module: MPDOSF

Syntax:
XULF
<status error return>

Registers: In D1.W = File ID

Description: The UNLOCK FILE primitive unlocks a locked file for access by any other task. The file is specified by the file ID in data register D1.

See Also: XLKF - Lock File

Possible Errors:
52 = File Not Open
59 = Bad File Slot
Disk errors

Example:

```
MOVE.W  D5,D1    ;GET FILE ID
XULF             ;UNLOCK FILE
  BNE.S ERROR
....
```

XULT

Unlock Task

Value: $A016

Module: MPDOSK1

Syntax: XULT

Registers: None

Description: The UNLOCK TASK primitive unlocks the current task by clearing the swap lock variable in system RAM. This allows other tasks to be scheduled and receive CPU time.

See Also: XLKT - Lock Task

Possible Errors: None

Example:

```
          XLKT              ;LOCK TASK WHILE WAITING
*
LOOP      TST.B    LMEM     ;CONDITION MET?
            BNE.S  LOOP     ;N, WAIT
          CLR.B    OMEM     ;Y, RESET
          XULT              ;UNLOCK TASK NOW
```

XUSP

Return to User Mode

Value: $A008

Module: MPDOSK1

Syntax: XUSP

Registers: None

Description: The RETURN TO USER MODE primitive moves your current task from supervisor mode to user mode. Executing an "ANDI.W #$DFFF,SR" instruction also returns you to user mode, but must be executed in supervisor mode. The XUSP primitive can be executed in either mode.

See Also: XLSR - Load Status Register
XSUP - Enter Supervisor Mode

Possible Errors: None

Example:

```
P1      EQU $FFFFCE01   ;1/O PORT
*
OUT     XSUP            ;ENTER SUPERVISOR
        MOVE.B D0,P1    ;OUTPUT
        XUSP            ;RETURN TO USER
        RTS             ;RETURN
```

XUTM

Unpack Time

Value: $A062

Module: MPDOSK3

Syntax: XUTM

Registers:

In D1.W = HOUR*256+MINUTE
(HHHH HHHH MMMM MMMM)

Out (A1) = HR:MN<null>

Description: The UNPACK TIME primitive converts a one word encoded date into a five character string terminated by a null (six characters total). Data register D1 contains the encoded time and returns a pointer to the formatted string in address register A1. The output of the FIX TIME & DATE (XFTD) primitive is valid input to this primitive.

See Also:

XFTD - Fix Time and Date
XPAD - Pack ASCII Date
XRDT - Read Date
XRTM - Read Time
XUAD - Unpack ASCII Date
XUDT - Unpack Date

Possible Errors: None

Example:

```
XFTD            ;GET SYSTEM TIME
MOVE D0,D1
XUTM            ;CONVERT TO STRING
XPLC            ;PRINT TIME
....
```

XVEC

Set/Read Exception Vector

Value: $A116

Module: MPDOSK1

Syntax: XVEC

Registers:

In D0.W = Exception number (#2-255)
(A0) = New exception service routine (0=read only)
Out (A0) = Old service routine

Description: XVEC sets and/or reads the execution vector for the system. The old service routine address is returned so that you may change a routine and then restore the former routine under program control.

See Also: XDTV - Define Trap Vectors

Possible Errors: None

Example:

```
START   MOVEQ.L  #5,D0          ;ZERO DIVIDE ERROR VECTOR
        LEA.L    ZDIV(PC),A0    ;GET NEW SYSTEM ZERO DIV VEC
        XVEC                    ;SET A RETURN OLD VEC IN A0
        DIVU.W   #0,D0          ;ZERO DIV ERROR
        XEXT                    ;WILL EXECUTE AFTER ZDIV EXCEP
*
* ZDIV EXCEPTION HANDLER
*
ZDIV    XPMC     M1             ;ZERO DIV EXCEPTION
        MOVEQ.L  #5,D0
        XVEC                    ;RESET TO OLD HANDLER
        RTE                     ;RETURN FROM EXCEPTION
*
M1      DC.B $0A,$0D,'ZERO DIVIDE EXCEPTION',0
*
        END START
```

Refer to the *Installation and Systems Management* guide for a list of user vectors that are implemented on your hardware. Changing vectors that are in use may cause the system to crash.

XWBF

Write Bytes to File

Value:

$A0F0

Module:

MPDOSF

Syntax:

XWBF
<status error return>

Registers:

In D0.L = Byte count - must be positive
D1.W = File ID
(A2) = Buffer address

Description:

The WRITE BYTES TO FILE primitive writes from a memory buffer, pointed to by address register A2, to a disk file specified by the file ID in register D1. Register D0 specifies the number of bytes to be written. If the channel buffer has been rolled to disk, the least-used buffer is freed and the buffer is restored to memory. The file slot ID is placed on the top of the last-access queue.

The write is independent of the data content. The buffer pointer in register A2 may be on any byte boundary. The write operation is not terminated with a null character.

A byte count of zero in register D0 results in no data being written to the file.

If it is necessary for the file to be extended, PDOS first uses sectors already linked to the file. If a null or end link is found, a new sector obtained from the disk sector bit map is linked to the end of the file. If this makes the file non-contiguous, it is retyped as a non-contiguous file.

See Also:

XRBF - Read Bytes From File
XRLF - Read Line From File
XWLF - Write Line To File

Possible Errors:

52 = File Not Open
55 = Too Few Contiguous Sectors
58 = File Delete or Write Protected
59 = Bad File Slot
60 = File Space Full
Disk errors

Example:

```
            MOVE.L  #252,D0    ;WRITE FULL SECTOR
            MOVE.W  D5,D1      ;GET ID
            LEA.L   BF(PC),A2  ;GET BUFFER ADDRESS
            XWBF               ;WRITE TO FILE
              BNE.S ERROR
            ....
BF          DS.B    256        ;SECTOR BUFFER
```

XWDT

Write Date

Value: $A064

Module: MPDOSK3

Syntax: XWDT

Registers:

In D0.B = Month (1-12)
D1.B = Day (1-31)
D2.B = Year (0-99)

Description:

The WRITE DATE primitive sets the system date counters. Register D0 specifies the month and ranges from 1 to 12. Register D1 specifies the day of month and ranges from 1 to 31. Register D2 is the last 2 digits of the year.

No check is made for a valid date.

Possible Errors: None

Example:

```
        MOVEQ.L #12,D0  ;SET DATE TO 12/25/80
        MOVEQ.L #25,D1
        MOVEQ.L #83,D2
        XWDT            ;SET DATE
        ....
```

XWFA

Write File Attributes

Value:

$A0F2

Module:

MPDOSF

Syntax:

XWFA
<status error return>

Registers:

In (A1) = File name
(A2) = ASCII file attributes

(A2)=0 clears all attributes.

Description:

The WRITE FILE ATTRIBUTES primitive sets the attributes of the file specified by the file name pointed to by register A1. Register A2 points to an ASCII string containing the new file attributes followed by a null character. The format is:

```
(A2) = {file type}{protection}

     {file type} = AC - Procedure file
                   BN - Binary file
                   OB - 68000 object file
                   SY - 68000 memory image
                   BX - BASIC binary token file
                   EX - BASIC ASCII file
                   TX - Text file
                   DR - System I/O driver

    {protection} = *  - Delete protect
                   ** - Delete and Write protect
```

If register A2 points to a zero byte, then all flags, with the exception of the contiguous flag, are cleared.

See Also:

XCFA - Close File With Attribute
XRFA - Read File Attributes
XWFP - Write File Parameters

Possible Errors:

50 = Bad File Name
53 = File Not Defined
54 = Bad File Attribute
Disk errors

Example:

```
LEA.L   FN(PC),A1 ;GET FILE NAME
        LEA.L   PF(PC),A2 ;SET BINARY & PROTECTED
        XWFA              ;SET
          BNE.S ERROR
        ....


FN      DC.B    'DATA:BIN',0
PF      DC.B    'BN**',0
        EVEN
```

XWFP

Write File Parameters

Value: $A0FC

Module: MPDOSF

Syntax:
XWFP
<status error return>

Registers:
In (A1) = File name
D0.L = Sector index of EOF/Bytes in last sector
D1.L = Time/Date created
D2.L = Time/Date last accessed
D3.W = ORed status (less contiguous bit)

Description: The WRITE FILE PARAMETERS primitive updates the end-of-file and date parameters of the file specified by the name pointed to by address register A1 in the disk directory.

See Also:
XCFA - Close File With Attribute
XRFA - Read File Attributes
XWFA - Write File Attributes

Possible Errors:
50 = Bad File Name
53 = File Not Defined
Disk errors

Example:

```
            LEA.L   FN(PC),A1  ;GET FILE NAME
            XRFA               ;READ FILE ATTRIBUTES
              BNE.S ERROR      ;ERROR
            ADDA.W  #20,A2     ;POINT TO
            MOVEM.L (A2),D5-D7 ;SAVE PARAMETERS
            ...

            MOVE.L  D5,D0
            MOVE.L  D6,D1
            MOVE.L  D7,D2
            LEA.L   FN(PC),A1  ;GET FILE NAME
            XWFP               ;UPDATE FILE PARAMETERS
              BNE.S ERROR
            ....


FN          DC.B    'DATA:BIN',0
            EVEN
```

XWLF

Write Line to File

Value:

$A0F4

Module:

MPDOSF

Syntax:

XWLF
<status error return>

Registers:

In D1.W = File ID
(A2) = Buffer address

Description:

The WRITE LINE TO FILE primitive writes a line delimited by a null character to the disk file specified by the file ID in register D1. Address register A2 points to the string to be written. If the channel buffer has been rolled to disk, the least-used buffer is freed and the buffer is restored to memory. The file slot ID is placed on the top of the last-access queue.

The write line primitive is independent of the data content, with the exception that a null character terminates the string. The buffer pointer in register A2 may be on any byte boundary. A single write operation continues until a null character is found.

If it is necessary for the file to be extended, PDOS first uses sectors already linked to the file. If a null link is found, a new sector obtained from the disk sector bit map is linked to the end of the file. If this makes the file non-contiguous, it is retyped as a non-contiguous file.

See Also:

XRBF - Read Bytes From File
XRLF - Read Line From File
XWBF - Write Bytes To File

Possible Errors:

52 = File Not Open
55 = Too Few Contiguous Sectors
58 = File Writ/Del Prot
59 = Bad File Slot
60 = File Space Full
Disk errors

Example:

```
            MOVE.W  D5,D1       ;GET FILE ID
            LEA.L   LB(PC),A2   ;GET LINE
            XWLF                ;WRITE LINE
              BNE.S ERROR       ;ERROR
            ....


LB          DC.B    $0A,$0D,'NO DIAGNOSTICS',0
            EVEN
```

XWSE

Write Sector

Value: $A0C6

Module: MPDOSF

Syntax:
XWSE
<status error return>

Registers:
In D0.B = Disk number
D1.W = Sector number
(A2) = Buffer address

Description:
The WRITE SECTOR primitive is a system-defined, hardware-dependent program which writes 256 bytes of data from a buffer, pointed to by address register A2, to the logical sector and disk device specified by data registers D1 and D0 respectively.

See Also:
BIOS in *PDOS Developer's Reference Manual*
XISE - Initialize Sector
XRSE - Read Sector
XRSZ - Read Sector Zero

Possible Errors:
Disk errors

Example:

```
            CLR.L   D0          ;WRITE TO DISK #0
            MOVEQ.L #10,D2      ;WRITE TO SECTOR #10
            LEA.L   BUF(PC),A2  ;GET BUFFER ADDRESS
            XWSE                ;WRITE
              BNE.S ERROR       ;PROBLEM
            ....

BUF         DS.B    256             ;DATA BUFFER
```

XWTM

Write Time

Value:

$A066

Module:

MPDOSK3

Syntax:

XWTM

Registers:

In D0.B = Hours (0-23)
D1.B = Minutes (0-59)
D2.B = Seconds (0-60)

Description:

The WRITE TIME primitive sets the system clock time. Register D0 specifies the hour and ranges from 0 to 23. Register D1 specifies the minutes and register D2, the seconds. The latter two range from 0 to 59.

There is no check made for a valid time.

Possible Errors:

None

Example:

```
MOVEQ.L #23,D0  ;SET TIME TO 23:59:59
MOVEQ.L #59,D1
MOVEQ.L #59,D2
XWTM            ;SET SYSTEM TIME
```

XZFL

Zero File

Value: $A0F6

Module: MPDOSF

Syntax:
XZFL
<status error return>

Registers: In (A1) = File name

Description: The ZERO FILE primitive clears a file of any data. If the file is defined, then the end-of-file marker is placed at the beginning of the file. If the file is not defined, it is defined with no data.

See Also:
XDFL - Define File
XDLF - Delete File

Possible Errors:
50 = Bad File Name
61 = File Already Open
68 = Not PDOS Disk
Disk errors

Example:

```
            LEA.L FN(PC),A1 ;POINT TO FILE
            XZFL            ;ZERO FILE
              BNE.S ERROR
            ....
FN          DC.B  'FILE:SR',0
            EVEN
```

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