UPDATE NOTICE
DECSYSTEM-20 Monitor Calls
Reference Manual
AD-4166C-T1

Insert this Update Notice in the Reference Manual to maintain an up-to-date record of changes to this manual.

CHANGED INFORMATION
The change pages contained in this update package reflect Version 3A of the TOPS-20 Software.

Additional copies of this Update Notice to the Reference Manual may be ordered from the Software Distribution Center, Digital Equipment Corporation, Maynard, Massachusetts 01754.
Order Code: AD4166C-T1
Base Manual Order Code: AA4166C-TM

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September 1978
INSTRUCTIONS
AD-4166C-T1

The following list specifies which pages are to be placed in the DECSYSTEM-20 Monitor Cells Reference Manual as a replacement for, or addition to, current pages. The left bracket ( [ ) means the pages are consecutive.

- Title page
- Copyright page
- 3-55 through 3-56.2
- 3-141 through 3-144.1
- 3-211 through 3-212
- 3-223 through 3-226
- 3-257 through 3-258
- Entire Appendix A
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- Reader’s Comment Page

September 1978.
## TYPE AND IDENTIFICATION OF DOCUMENTATION CHANGES

Five types of changes are used to update documents contained in the DECSYSTEM-20 Software manuals. Change symbols and notations are used to specify where, when, and why alterations were made to each updated page. The five types of update changes and the manner in which each is identified are described in the following table.

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<th>Identify the Following Types of Update</th>
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<td>1. Change bar in outside margin; version number change date printed at bottom of page.</td>
<td>1. Changes were required by a new version of the software being described.</td>
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<td>5. Bullet (•) in outside margin; change date printed at bottom of page.</td>
<td>5. Data was deleted either to clarify or correct the existing material.</td>
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September 1978
This manual describes all of the monitor calls that exist in the TOPS-20 system. For easy reference, the monitor call descriptions are arranged alphabetically and presented concisely.

This manual updates the manual of the same name, Order Number: AA-4166C-TM.

OPERATING SYSTEM: TOPS-20 VERSION 3A
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The postage-prepaid READER'S COMMENTS form on the last page of this document requests the user's critical evaluation to assist us in preparing future documentation.
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Returns author and last writer name strings

Gets current job information

Gets the next JFN

Gets the primary JFNs

Gets current date and time

Gets disk allocation of a directory

Gets information of directory entry

Gets a File Descriptor Block

Short Form

Long Form

Get trap information

Gets trap words

Gets a file's status

Gets the terminal type number

Halts the current process

Halts a process

Returns values of high precision clocks

Halts the system

Inputs date and time conversion

Inputs date and time

Inputs date/time without converting

Initiates software interrupts on specified channels

Lists job's logical names

Translates a JFN to a string

Kills a process

Kills a job

Converts a logical name to a string

Logs in a job

Loads VFU or translation RAM

Receives an IPCF message

Sends an IPCF message

Starts a process in monitor mode

Performs structure-dependent functions

Associates magnetic tape drive with logical unit number

Performs device-dependent functions

Performs IPCF control functions

Inputs an integer number

Perform network utility functions

Outputs an integer number

Outputs date and time conversion

Outputs date and time

Outputs date/time without converting

Opens a file

Inputs the next byte

Outputs the next byte

Obtains monitor data

Locks physical pages

Maps pages

Controls physical memory

Translates project-programmer number to string

Reads/sets process argument block
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subsequent references to the file, are also invoked when a file is
opened. For example, a file's position pointer is normally reset to
the beginning of the file such that the first sequential input
operation reads the beginning data of the file.

2.2.5 Sample Program

A sample program follows which acquires JFNs, opens both an input and
an output file, and then copies data from the input file to the output
file in 7-bit bytes until the end of the input file is encountered.

;;; PROGRAM TO COPY INPUT FILE TO OUTPUT FILE. ***
;;; (USING BIN/BOUT AND IGNORING NULL'S)
TITLE FILEIO ;TITLE OF PROGRAM
SEARCH MONSYM ;SEARCH SYSTEM JSYS-SYMBOL LIBRARY

;;; IMPURE DATA STORAGE AND DEFINITIONS ***

INJFN: BLOCK 1 ;STORAGE FOR INPUT JFN
OUTJFN: BLOCK 1 ;STORAGE FOR OUTPUT JFN
PDLEN=3 ;STACK HAS LENGTH 3
PDLST: BLOCK PDLEN ;SET ASIDE STORAGE FOR STACK
A==1 ;JYS AC'S
B==2
C==3
D==4
Tl==5 ;TEMPORARY AC'S
... P==17 ;PUSH DOWN POINTER

;;; PROGRAM INITIALIZATION ***

START: RESET ;CLOSE FILES AND INITIALIZE PROCESS
MOVE P,[IOWD PDLEN,PDLST] ;ESTABLISH STACK

;;; GET INPUT-FILE ***

INFIL: HRROI A,[ASCII /]
INPUT FILE: / ;PROMPT FOR INPUT FILE
PSOUT ;ON CONTROLLING TERMINAL
MOVE A,[GJ%OLD+GJ%FNS+GJ%SHT];SEARCH MODES FOR GTJFN
;[EXISTING FILE ONLY, FILE-NR'S IN B
; SHORT CALL ]
MOVE B,[.PRIIN,.PRIOU] ;GTJFN'S I/O WITH CONTROLLING TERMINAL
GTJFN ;GET JOB FILE NUMBER (JFN)
ERCAL [ PUSHJ P,WARN ;IF ERROR, GIVE WARNING
JIRST INFIL] ;AND LET HIM TRY AGAIN
MOVEM A,INJFN ;SUCCESS, SAVE THE JFN
FUNCTIONAL ORGANIZATION OF JSYS'S

*** GET OUTPUT-FILE ***

OUTFIL: HRROI A, [ASCIZ /
OUTPUT FILE: /]
              ; PROMPT FOR OUTPUT FILE
              ; PRINT IT
              ; PRINT IT
              ; GET JOB-FILE NUMBER
              ; GET JOB-FILE NUMBER
              ; GET JOB-FILE NUMBER
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              ; GET JOB-FILE NUMBER
              ; GET JOB-FILE NUMBE
FUNCTIONAL ORGANIZATION OF JSYS'S

<table>
<thead>
<tr>
<th>Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>time integral of number of runnable processes</td>
</tr>
<tr>
<td>14</td>
<td>exponential 1-minute average of number of runnable processes</td>
</tr>
<tr>
<td>15</td>
<td>exponential 5-minute average of number of runnable processes</td>
</tr>
<tr>
<td>16</td>
<td>exponential 15-minute average of number of runnable processes</td>
</tr>
<tr>
<td>17</td>
<td>time integral of number of processes waiting for the disk</td>
</tr>
<tr>
<td>20</td>
<td>time integral of number of processes waiting for the drum</td>
</tr>
<tr>
<td>21</td>
<td>number of terminal input characters</td>
</tr>
<tr>
<td>22</td>
<td>number of terminal output characters</td>
</tr>
<tr>
<td>23</td>
<td>number of system core management cycles</td>
</tr>
<tr>
<td>24</td>
<td>time spent doing postpurging</td>
</tr>
<tr>
<td>25</td>
<td>number of forced balance set process removals</td>
</tr>
<tr>
<td>26</td>
<td>time integral of number of processes in swap wait</td>
</tr>
<tr>
<td>27</td>
<td>scheduler overhead time (same as entry 2) in high precision units</td>
</tr>
<tr>
<td>30</td>
<td>idle time (same as entry 0) in high precision units</td>
</tr>
<tr>
<td>31</td>
<td>lost time (same as entry 1) in high precision units</td>
</tr>
<tr>
<td>32</td>
<td>user time</td>
</tr>
</tbody>
</table>

NOTE

This table is subject to change (usually additions) as measuring routines are added to the system.

<table>
<thead>
<tr>
<th>QTIMES</th>
<th>0 to n</th>
<th>Accumulated runtime of jobs on the n scheduler queues</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOBNAM</td>
<td>Job #</td>
<td>LH: reserved for DEC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RH: index into the system program tables for the system program being used by this job (determined by the last SETSN call executed by the job)</td>
</tr>
<tr>
<td>JOBPNM</td>
<td>Job #</td>
<td>SIXBIT name of program running in this job</td>
</tr>
</tbody>
</table>

The system program tables SNAMES, STIMES, SPFLTS, SSIZE, and SNBLKS are parallel in that the same entry in each table pertains to the same system program. The system program being run by a specific job may be determined from SNAMES, using an index obtained from table JOBNAM (above).

<table>
<thead>
<tr>
<th>SNAMES</th>
<th>SIXBIT name of system program, or 0 if this entry is unused in this and the corresponding four tables.</th>
</tr>
</thead>
<tbody>
<tr>
<td>STIMES</td>
<td>Total runtime of system program</td>
</tr>
<tr>
<td>SPFLTS</td>
<td>Total number of page faults of system program</td>
</tr>
<tr>
<td>SSIZE</td>
<td>Time integral of working set size</td>
</tr>
<tr>
<td>SNBLKS</td>
<td>Number of samples in working set size integral</td>
</tr>
<tr>
<td>DBUGSW</td>
<td>Debugging information</td>
</tr>
<tr>
<td>0</td>
<td>state of operator coverage (0=unattended, 1=attended, 2=debugging)</td>
</tr>
<tr>
<td>1</td>
<td>state of BUGCHK handling (0=proceed, 1=breakpoint)</td>
</tr>
</tbody>
</table>
FUNCTIONAL ORGANIZATION OF JSYS'S

LOGDES  Logging information
  0  designator for logging information
  1  designator for job 0 and error information

PTYPAR  Pseudo-TTY parameter information
  0  LH: number of PTYS in system
  RH: TTY number of first PTY

SYMTAB  SIXBIT table names of all GETAB tables

DWNTIM  Downtime information
  0  date and time when system will be shut down next
  1  date and time when system will subsequently be up

BLDTD  Date and time system was generated

APRID  Processor serial number

HQLAV  High queue load averages

LQLAV  Low queue load averages

JBONT  Owning job

NSWPNG  Default swapping pages

The following monitor calls are used for obtaining information:

GETER  Returns the last error condition
SETER  Sets the last error condition
ERSTR  Translates an error number to a string
ESOUT  Returns an error string
SYSGT  Returns values for a system table
GETAB  Returns a word from a system table
SETNM  Sets the program's private name
SETSN  Sets the program's system and private names
GETNM  Returns the program name being used by the job
SETJB  Sets a job's parameters
GETJI  Returns job information for specified job
GJINF  Returns job information for current job
STAD  Sets the system's date
GTAD  Returns the system's date
TIME  Returns the time since the system was restarted
TIMER  Sets the runtime limit of a job
RUNTM  Returns the runtime of a job or process
HPTIM  Returns the high-precision clock values
GTDAL  Returns the disk allocation of a directory
GTRPI  Returns the paging trap information
GTRPW  Returns the trap words

2.1 COMMUNICATING WITH DEVICES

The monitor calls in this group are used to communicate with the devices on the system. Some of these devices are line printers, magnetic tapes, terminals, and card readers.
FUNCTIONAL ORGANIZATION OF JSYS'S

Refer to Section 2.4.3.2 for the explanation of the control character output control (CCOC) words.

<table>
<thead>
<tr>
<th>ASCII Code</th>
<th>Wakeup Class</th>
<th>CCOC Word (bits)</th>
<th>Character or Control Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>C</td>
<td>1(B0,1)</td>
<td>CTRL/@ null, break</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>1(B2,3)</td>
<td>CTRL/A</td>
</tr>
<tr>
<td>2</td>
<td>C</td>
<td>1(B4,5)</td>
<td>CTRL/B</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>1(B6,7)</td>
<td>CTRL/C</td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>1(B8,9)</td>
<td>CTRL/D</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>1(B10,11)</td>
<td>CTRL/E</td>
</tr>
<tr>
<td>6</td>
<td>C</td>
<td>1(B12,13)</td>
<td>CTRL/F</td>
</tr>
<tr>
<td>7</td>
<td>C</td>
<td>1(B14,15)</td>
<td>CTRL/G bell</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>1(B16,17)</td>
<td>CTRL/H backspace</td>
</tr>
<tr>
<td>11</td>
<td>P</td>
<td>1(B18,19)</td>
<td>CTRL/I horizontal tab</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>1(B20,21)</td>
<td>CTRL/J line feed</td>
</tr>
<tr>
<td>13</td>
<td>C</td>
<td>1(B22,23)</td>
<td>CTRL/K vertical tab</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>1(B24,25)</td>
<td>CTRL/L form feed</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>1(B26,27)</td>
<td>CTRL/M carriage return</td>
</tr>
<tr>
<td>16</td>
<td>C</td>
<td>1(B28,29)</td>
<td>CTRL/N</td>
</tr>
<tr>
<td>17</td>
<td>C</td>
<td>1(B30,31)</td>
<td>CTRL/O</td>
</tr>
<tr>
<td>20</td>
<td>C</td>
<td>1(B32,33)</td>
<td>CTRL/P</td>
</tr>
<tr>
<td>21</td>
<td>C</td>
<td>1(B34,35)</td>
<td>CTRL/Q</td>
</tr>
<tr>
<td>22</td>
<td>C</td>
<td>2(B0,1)</td>
<td>CTRL/R</td>
</tr>
<tr>
<td>23</td>
<td>C</td>
<td>2(B2,3)</td>
<td>CTRL/S</td>
</tr>
<tr>
<td>24</td>
<td>C</td>
<td>2(B4,5)</td>
<td>CTRL/T</td>
</tr>
<tr>
<td>25</td>
<td>C</td>
<td>2(B6,7)</td>
<td>CTRL/U</td>
</tr>
<tr>
<td>26</td>
<td>C</td>
<td>2(B8,9)</td>
<td>CTRL/V</td>
</tr>
<tr>
<td>27</td>
<td>C</td>
<td>2(B10,11)</td>
<td>CTRL/W</td>
</tr>
<tr>
<td>30</td>
<td>C</td>
<td>2(B12,13)</td>
<td>CTRL/X</td>
</tr>
<tr>
<td>31</td>
<td>C</td>
<td>2(B14,15)</td>
<td>CTRL/Y</td>
</tr>
<tr>
<td>32</td>
<td>C</td>
<td>2(B16,17)</td>
<td>CTRL/Z</td>
</tr>
<tr>
<td>33</td>
<td>all</td>
<td>2(B18,19)</td>
<td>escape (altmode)</td>
</tr>
<tr>
<td>34</td>
<td>C</td>
<td>2(B20,21)</td>
<td>FS CTRL/backslash</td>
</tr>
<tr>
<td>35</td>
<td>C</td>
<td>2(B22,23)</td>
<td>GS CTRL/right square bracket</td>
</tr>
<tr>
<td>36</td>
<td>C</td>
<td>2(B24,25)</td>
<td>RS CTRL/uparrow</td>
</tr>
<tr>
<td>37</td>
<td>F</td>
<td>2(B26,27)</td>
<td>US CTRL/backarrow</td>
</tr>
<tr>
<td>40</td>
<td>P</td>
<td>2(B20,21)</td>
<td>space</td>
</tr>
<tr>
<td>41</td>
<td>P</td>
<td>2(B22,23)</td>
<td>CTRL/backslash</td>
</tr>
<tr>
<td>42</td>
<td>P</td>
<td>2(B24,25)</td>
<td>CTRL/right square bracket</td>
</tr>
<tr>
<td>43</td>
<td>P</td>
<td>2(B26,27)</td>
<td>CTRL/uparrow</td>
</tr>
<tr>
<td>44</td>
<td>P</td>
<td>2(B30,31)</td>
<td>US CTRL/backarrow</td>
</tr>
<tr>
<td>45</td>
<td>P</td>
<td>2(B32,33)</td>
<td>space</td>
</tr>
<tr>
<td>46</td>
<td>P</td>
<td>2(B34,35)</td>
<td>CTRL/backslash</td>
</tr>
<tr>
<td>47</td>
<td>P</td>
<td>2(B0,1)</td>
<td>escape (altmode)</td>
</tr>
<tr>
<td>50</td>
<td>P</td>
<td>2(B2,3)</td>
<td>CTRL/S</td>
</tr>
<tr>
<td>51</td>
<td>P</td>
<td>2(B4,5)</td>
<td>CTRL/T</td>
</tr>
<tr>
<td>52</td>
<td>P</td>
<td>2(B6,7)</td>
<td>CTRL/U</td>
</tr>
<tr>
<td>53</td>
<td>P</td>
<td>2(B8,9)</td>
<td>CTRL/V</td>
</tr>
<tr>
<td>54</td>
<td>P</td>
<td>2(B10,11)</td>
<td>CTRL/W</td>
</tr>
<tr>
<td>55</td>
<td>P</td>
<td>2(B12,13)</td>
<td>CTRL/X</td>
</tr>
<tr>
<td>56</td>
<td>P</td>
<td>2(B14,15)</td>
<td>CTRL/Y</td>
</tr>
<tr>
<td>57</td>
<td>P</td>
<td>2(B16,17)</td>
<td>CTRL/Z</td>
</tr>
<tr>
<td>60-71</td>
<td>A</td>
<td>0-9</td>
<td>0-9</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>ASCII Code</th>
<th>Wakeup Class</th>
<th>CCOC Word(bits)</th>
<th>Character or Control Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td>P</td>
<td></td>
<td>&gt;</td>
</tr>
<tr>
<td>77</td>
<td>P</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td>100</td>
<td>P</td>
<td></td>
<td>@</td>
</tr>
<tr>
<td>101-132</td>
<td>A</td>
<td></td>
<td>upper case letters A-Z</td>
</tr>
<tr>
<td>133</td>
<td>P</td>
<td></td>
<td>[</td>
</tr>
<tr>
<td>134</td>
<td>P</td>
<td></td>
<td>\</td>
</tr>
<tr>
<td>135</td>
<td>P</td>
<td></td>
<td>]</td>
</tr>
<tr>
<td>136</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>137</td>
<td>P</td>
<td></td>
<td>accent (grave)</td>
</tr>
<tr>
<td>141-172</td>
<td>A</td>
<td></td>
<td>lower case letters a-z</td>
</tr>
<tr>
<td>173¹</td>
<td>P</td>
<td></td>
<td>left brace</td>
</tr>
<tr>
<td>174¹</td>
<td>P</td>
<td></td>
<td>vertical bar</td>
</tr>
<tr>
<td>175¹</td>
<td>P</td>
<td></td>
<td>right brace</td>
</tr>
<tr>
<td>176¹</td>
<td>P</td>
<td></td>
<td>tilde</td>
</tr>
<tr>
<td>177</td>
<td>all</td>
<td></td>
<td>delete (rubout)</td>
</tr>
</tbody>
</table>

NOTE

ESC(33) and DELETE(177) are considered to be in all wakeup classes.

¹ If the terminal does not have B3l(TT%LIC) on in the JFN mode word, codes 173 through 176 are converted to code 33 on input.

2.4.3.4 Terminal Characteristics Control - The various types of terminals have different characteristics for output processing, depending on their type and speed. The characteristics that can be associated with terminals are:

1. mechanical form feed and tab
2. lower case
3. padding after carriage return
4. padding after line feed
5. padding after mechanical tab
6. padding after mechanical form feed
7. page width and length

Instead of setting each of these parameters for his line, the user can specify a terminal type number, which causes the appropriate parameters to be set. Refer to the STTYP monitor call. The defined terminal types, along with their characteristics, are listed below.
For conversions between local and internal date and time, the time zone in which the installation is located is normally used, with daylight saving applied from 4AM on the next to last Sunday in April to 3:59:59AM on the next to last Sunday in October.

Two monitor calls in this group, IDTIM and ODTIM, convert date and time between text strings (in core or in a file) and internal format. These should satisfy most users. However, there are four more calls, which are subsets of IDTIM and ODTIM. The calls ODTNC, IDTNC, ODCNV, and IDCNV make available separately the conversion between internal format date and time and separate numbers for local year, month, and day, and the conversion between those numbers and text strings. They also provide additional options, which give the caller more control over the conversion performed than IDTIM and ODTIM.

Time zones occur in the calling sequences of the latter four JSYS's. A time zone is represented internally as a number between -12 and 12 decimal, representing the number of hours west of Greenwich. For example, EST is zone 5. Zones -12 and 12 represent the same time but different days because the zones are on opposite sides of the international date line.

The I/O conversion monitor calls are as follows:

- NIN: Inputs integer number
- NOUT: Outputs integer number
- FLIN: Inputs floating-point number
- FLOUT: Outputs floating-point number
- DFIN: Inputs double-precision, floating-point number
- DOUT: Outputs double-precision, floating-point number
- IDTIM: Inputs date and time, converting to internal format
- ODTIM: Outputs date and time, converting from internal format to text
- IDTNC: Inputs date and time without converting to internal format
- ODTNC: Outputs date and time in internal format
- IDCNV: Converts from day, month, year to internal date and time
- ODCNV: Converts from internal date and time to day, month, year
- GTAD: Gets current date and time in internal format

### 2.9 PRIVILEGED MONITOR CALLS

The following monitor calls are privileged and require the process to have WHEEL or OPERATOR capability enabled:

- ALLOC: Allocates a device to a particular job
- BOOT: Performs functions required for loading front-end software
- CRDIR: Creates or modifies a directory
- GTDIR: Returns directory information
- DSKOP: Allows hardware address specification of disk transfers
- DIAG: Reserves and releases hardware channels
- DSKAS: Assigns specific disk addresses
- SJPRI: Sets job priority
- SPRIW: Sets process priority
- HSYS: Specifies system shutdown times
- USRIO: Places program in user I/O mode
- MSFRK: Starts a process in monitor mode
- NODE: Performs network utility functions
- PEEK: Reads monitor data
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- PLOCK: Locks physical pages
- SNOOP: Performs system analysis
- SYERR: Records data in the system error file
- SMON: Sets various monitor flags
- EFECT: Records data in the FACT file
- MTALN: Associates magnetic tape drive with logical unit number
- TTMSG: Sends a message to a terminal
- PMCTL: Controls physical memory
- USAGE: Writes entries into the system's accounting data file
- UTEST: Tests monitor routines
Block until a signal (doorbell) to the DECSYSTEM-20 is initiated by the communications front end. This function is used to synchronize the caller with the bootstrap program in the front end.

Argument Block

0 .BTDTE DTE-20 number

Read data from the communications front end using the previously loaded secondary or tertiary bootstrap program. The bootstrap program must abide by the protocol for DTE-20 transfers. The first two bytes of data will be interpreted as a count of the remaining number of bytes of data.

Argument Block

0 .BTDTE DTE-20 number
1 .BTERR Error status flags returned on failure of the call
2 Not used and must be zero.
3 .BTFLG User-supplied flag word
4 .BTCNT Maximum number of bytes to transfer. After successful execution of this function, this word is updated to reflect the actual number of bytes transferred.
5 .BTMPT Pointer to where data is to be placed

Load a KMC11 (DECSYSTEM-20 only). This function will optionally load the CRAM, DRAM, and the four UNIBUS registers. Before the KMC11 is loaded, the system verifies that each bit in UNIBUS registers can be set and cleared. Before the DRAM is loaded, the system verifies that each bit in the entire DRAM can be set and cleared. After the CRAM, DRAM, and registers are loaded, they are verified to ensure that the data was properly loaded. If the register data is not supplied, the UNIBUS registers will be cleared before the KMC11 is started.
TOPS-20 MONITOR CALLS (BOOT)

Argument Block

0 .BTKMC  KMCll address
1 .BTKER  Error flags returned
          B0 (BT%CVE) CRAM verify error (right half is bad).
          B1 (BT%DVE) DRAM verify error (right half is bad).
          B2 (BT%RVE) Register verify error (right half is bad).
2 .BTKCC  Count of CRAM data.
3 .BTKCP  Pointer to CRAM data (16-bit data).
4 .BTKDC  Count of DRAM data.
5 .BTKDP  Pointer to DRAM data (8-bit data).
6 .BTKRC  Count of register data.
7 .BTKRP  Pointer to register data (16-bit data).
8 .BTKSA  Right-halfword is starting address.
          B0 (BT%KSA) Right-halfword is set; start KMCll.
12 .BTKMS  Dump a KMCll (DECSYSTEM-2020 only). This function will optionally dump the CRAM, DRAM, and registers if space is provided. The registers are SEL0, SEL2, SEL4, SEL6, INDATA, OUTDATA, INBA, OUTBA, and MISC*400+NPR.

Argument Block

0 .BTKMC  KMCll address.
1 .BTKER  Error flags returned.
          B0 (BT%CVE) CRAM verify error (right half is bad).
          B1 (BT%DVE) DRAM verify error (right half is bad).
          B2 (BT%RVE) Register verify error (right half is bad).
TOPS-20 MONITOR CALLS (BOOT)

2 .BTKCC Count of CRAM data.
3 .BTKCP Pointer to CRAM data (16-bit data).
4 .BTKDC Count of DRAM data.
5 .BTKDP Pointer to DRAM data (8-bit data).
6 .BTKRC Count of register data.
7 .BTKRP Pointer to register data (16-bit data).

13 .BTRLC Return line counters. All counters are positive numbers.

Argument Block

0 .BTPRT Port number.
1 .BTSCC Status count counter.
2 .BTSCP Status count pointer.
3 .BTRCC Receive count counter.
4 .BTRCP Receive count pointer.
5 .BTTCC Transmit count counter.
6 .BTTCP Transmit count pointer.

14 .BTCLI Convert line id to port number.

Argument Block

1 .BTLID Pointer to ASCIZ line id.

15 .BTCNP Convert NSP port number to line id.

Argument Block

1 .BTLID Pointer to ASCIZ line id.

The error status flag returned in word .BTERR on failure of a BOOT call are front-end reload status bits recorded in the SYSERR error file. (Refer to the TOPS-10 and TOPS-20 SYSERR Manual for an explanation of these status bits.)

Generates an illegal instruction interrupt on error conditions below.

BOOT ERROR MNEMONICS:

BOTX01: invalid DTE-20 number
BOTX02: invalid byte size
BOTX03: invalid protocol version number
BOTX04: byte count is not positive

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TOPS-20 MONITOR CALLS (COMND)

1 .CMNUM
   Parse a number. Word .CMDAT contains the radix (from 2 to 10) of the number. On a successful return, AC2 contains the number.

2 .CMNOI
   Parse a guide word string, but do not return an error if no guide word is input. An error is returned only if a guide word is input that does not match the one expected by the COMND call. A guide word field must be delimited by parentheses. Word .CMDAT contains a pointer to an ASCIZ string. This string does not contain the parentheses of the guide word. Guide words are output if the user terminated the previous field with ESC. Guide words are not output, nor can they be input, if the user has caused parsing into the next field.

3 .CMSWI
   Parse a switch. A switch field must begin with a slash and can be terminated with a colon in addition to any of the legal terminators. Word .CMDAT contains the address of a switch keyword symbol table. (Refer to the TBLUK monitor call description for the format of the table.) The entries in the table do not contain the slash of the switch keywords; however, they should end with a colon if the switch requires a value. The data bits CM%INV, CM%NOR, and CM%ABR defined for the .CMKEY function can also be set on this function. On a successful return, AC2 contains the address of the table entry where the switch keyword was found.

4 .CMIFI
   Parse an input file specification. This function causes the COMND call to execute a GTJFN call to attempt to parse the specification for an existing file, using no default fields. The .CMGJB address (word 11 in the command state block) must be supplied, but no data should be stored in the block. (Data stored in the block will be overwritten by this COMND call.) On a successful return, AC2 contains the JFN assigned.

5 .CMOFI
   Parse an output file specification. This function causes the COMND call to execute a GTJFN call to attempt to parse the specification for either a new or an existing file. The default generation number is the generation number of the existing file plus 1. The .CMGJB address must be supplied, but no data should be stored in the block. On a successful return, AC2 contains the JFN assigned.

6 .CMFIL
   Parse a general (arbitrary) file specification. This function causes the COMND call to execute a GTJFN to attempt to parse the specification for the file. The .CMGJB address must be supplied, but no data should be stored in words .GJSRC, .GJCPP, .GJCPC, and .GJRTY of the GTJFN block. Also, the COMND call sets the following flag bits in the GTJFN block: GJ%XTN, GJ%RND, GJ%RBF, GJ%RCM, and GJ%RIE. (Refer to the long-form GTJFN
call description for an explanation of these words and flag bits.) The program can set any other words and flag bits in the GTJFN block it supplies. On a successful return, AC2 contains the JFN assigned.

Parse an arbitrary field. This function is useful for fields not normally handled by the COMND call. The input, as delimited by the first nonalphanumeric character, is copied into the atom buffer; the delimiter is not copied. (Hyphens are treated as alphanumerics in this application only.) No application is performed nor is any standard help message available. (See below.)

Confirm. This function waits for the user to confirm the command with a carriage return and should be used at the end of parsing a command line.

Parse a directory name. Login and files-only directories are allowed. Word .CMDAT contains data bits for this function. The currently defined bit is as follows:

B0(CM&DWC) Allow wildcard characters to be typed in a directory name.

On a successful return, AC2 contains the 36-bit directory number.

Parse a user name. Only login directories are allowed. On a successful return, AC2 contains the 36-bit user number.

Comma. Sets Bl(CM&NOP-no parse) in word .CMFLG of the command state block and returns if a comma is not the next item in the input. Blanks can appear on either side of the comma. This function is useful for parsing a list of arguments.

Initialize the command line (e.g., set up internal monitor pointers and type the prompt). This function should be used at the beginning of parsing a command line but not when reparsing a line.

Parse a floating-point number. On a successful return, AC2 contains the floating-point number.

Parse a device name. On a successful return, AC2 contains the device designator.

Parse the input text up to the next carriage return, place the text in the atom buffer, and return. If an ESC or CTRL/F is typed, it causes the terminal bell to ring (because recognition is not available with this function) and is otherwise ignored. If a ? is typed, an appropriate response is given, and the ? is not included in the atom buffer. (A ? can be included in the input text if it is preceded by a CTRL/V.)
TOPS-20 MONITOR CALLS (DIAG)

DIAG  JSYS 530

Reserves a channel and either a single device or all devices attached to that channel. This call is also used to release the channel and its devices. When the request is made, no new activity is initiated on the requested channel, and the monitor waits for current activity on all devices connected to the channel to complete. When the channel becomes idle, the process requesting the channel continues running.

The DIAG JSYS can also be used to get and release memory. The get memory function is used by the system program TGHA for performing its spare bit substitution.

Reserving or Releasing a Channel and Device(s).

ACCEPTS IN AC1: length of the argument block in the left half, and address of the argument block in the right half.

RETURNS  +1: failure, error code in AC1
          +2: success

The format of the argument block is as follows:

  function code
  data words for the function

The available functions are as follows:

<table>
<thead>
<tr>
<th>Function</th>
<th>Symbol</th>
<th>Data Words</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.DGACU</td>
<td>device address</td>
<td>Assign the channel and a single device. Force the device to be released after the time limit specified.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>time limit in milliseconds</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.DGACH</td>
<td>device address</td>
<td>Assign the channel and all devices.</td>
</tr>
<tr>
<td>3</td>
<td>.DGRCH</td>
<td>device address</td>
<td>Release the channel and all assigned devices.</td>
</tr>
<tr>
<td>4</td>
<td>.DGSCP</td>
<td>device address</td>
<td>Set up the channel program. The data transfer must be in one page. The user page pointed to by the channel control word is locked in memory. The Exec Process Table location corresponding to the channel is updated with the appropriate physical address channel control word.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>channel control word</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>.DGRCP</td>
<td>device address</td>
<td>Release the channel program. The page pointed to by the channel control word for the specified channel is unlocked. This function is not required before specifying a new channel program.</td>
</tr>
</tbody>
</table>
TOPS-20 MONITOR CALLS (DIAG)

6 .DGGCS device address Return the status of the channel. The specified words are the logout area for the channel.
word 0
word 1
word 2
word 4

The device address given in the argument block is a machine-dependent specification for the channel and device to be assigned. The devices that can be assigned must be attached to the RH20 controller and must be mounted by a process with the WHEEL, OPERATOR, or MAINTENANCE capability enabled. The format of the device address word is

<table>
<thead>
<tr>
<th>0</th>
<th>2</th>
<th>3</th>
<th>9</th>
<th>10</th>
<th>23</th>
<th>24</th>
<th>29</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>address ! device ! 0 ! unit ! subunit !</td>
<td>type ! code !</td>
<td>!</td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DIAG ERROR MNEMONICS:

DIAGX1: invalid function
DIAGX2: device is not assigned
DIAGX3: argument block too small
DIAGX4: invalid device type
DIAGX5: WHEEL, OPERATOR, or MAINTENANCE capability required
DIAGX6: invalid channel command list
DIAGX7: illegal to do I/O across page boundary
DIAGX8: no such device
DIAGX9: unit does not exist
DIAG10: subunit does not exist

Getting Memory

ACCEPTS IN AC1: minus count of controllers in left half; address of argument block in right half.

RETURNS +1: failure; error code in AC1
+2: success

The format of the argument block is as follows:

word 0 function code (.DGGEM)
word 1 first page in user address space
word 2 first physical memory page
word 3 number of pages
word 4 user address of AR/ARX parity trap routines
Upon successful return, this function accomplishes the following:

TOPS-20 has requested that all of the front ends refrain from accessing common memory.

The hardware PI system has been turned off; no scheduling can occur.

The time base and interval timer have been turned off.

All DTE byte transfers have completed.

All RH20 activity has ceased.

The designated pages of the process' address space have been set up to address the designated physical memory. Note that this is not the same as your having requested the pages with PLOCK. With the get memory function, the data in the physical memory pages have been retained, and the ownership of the pages is unchanged.

The CST0 entries for each of the designated physical pages have been saved and set as follows:

The age is set to the present age of the requesting process.

The process use field is set to all ones.

The modified bit is set to one.

The entire address space of the requesting process has been locked in memory. (Actually, only the pages that existed at the time of the DIAG call are locked. Therefore, the process must ensure that all of the pages it needs exist and are private when DIAG is executed.)

Releasing Memory

ACCEPTS IN ACL: minus count of controllers left half; address of argument block in right half.

RETURNS  +1: failure; error code in ACL
          +2: success

The format of the argument block is as follows:

word 0    function code (.DGREM)
TOPS-20 MONITOR CALLS (DIAG)

DIAG ERROR MNEMONICS

DIAGX1: invalid function
DIAGX3: argument block too small
DIAGX5: WHEEL, OPERATOR, or MAINTENANCE capability required
DIAGX7: illegal to do I/O across page boundary

DIBE  JSYS 212

Dismisses the process until the designated file input buffer is empty.

Accepts IN ACl: file designator

Returns +1: always

Returns immediately if the designator is not associated with a terminal.

The DOBE monitor call can be used to dismiss the process until the designated file output buffer is empty.

Generates an illegal instruction interrupt on error conditions below.

DIBE ERROR MNEMONICS:

DESX1: invalid source/destination designator
DESX3: JFN is not assigned
TOPS-20 MONITOR CALLS (DUMPO)

DUMPO ERROR MNEMONICS:
DUMPX1: command list error
DUMPX2: JFN is not open in dump mode
DUMPX3: address error (too big or crosses end of memory)
DUMPX4: access error (cannot read or write data in memory)
DUMPX5: no-wait dump mode not supported for this device
DUMPX6: dump mode not supported for this device
DESX1: invalid source/destination designator
DESX2: terminal is not available to this job
DESX3: JFN is not assigned
DESX4: invalid use of terminal designator or string pointer
DESX5: file is not open
IOX2: file is not opened for writing
IOX5: device or data error
IOX11: quota exceeded or disk full

DVCHR JSYS 117

Returns the device characteristics of the specified device.

ACCEPTS IN AC1: JFN or device designator

RETURNS +1: always, with
AC1 containing the device designator (even if a JFN was given).
AC2 containing the device characteristics word.
AC3 containing the job number to which the device is assigned in the left half and the unit number in the right half. If the device is a structure or does not have units, the right half is -1.

The contents of AC3 are -1 if the device is not assigned to any job or -2 if the device allocator has ownership of the UFN or device designator.

Device Characteristics Word

<table>
<thead>
<tr>
<th>Bit</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>DV%OUT</td>
<td>device can do output</td>
</tr>
<tr>
<td>1</td>
<td>DV%IN</td>
<td>device can do input</td>
</tr>
<tr>
<td>2</td>
<td>DV%DIR</td>
<td>device has a directory</td>
</tr>
<tr>
<td>3</td>
<td>DV%AS</td>
<td>device is assignable with ASND</td>
</tr>
<tr>
<td>4</td>
<td>DV%MDD</td>
<td>device has multiple directories</td>
</tr>
</tbody>
</table>

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### Device Characteristics Word (Cont.)

<table>
<thead>
<tr>
<th>Code</th>
<th>DV%AV</th>
<th>Device Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>device is available or assigned to this job</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>device is assigned by ASND</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>device is mounted</td>
<td></td>
</tr>
<tr>
<td>9-17</td>
<td>device type</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>DVDSK</td>
<td>disk</td>
</tr>
<tr>
<td>2</td>
<td>DVMTA</td>
<td>magnetic tape</td>
</tr>
<tr>
<td>7</td>
<td>DVLPT</td>
<td>line printer</td>
</tr>
<tr>
<td>10</td>
<td>DVCDR</td>
<td>card reader</td>
</tr>
<tr>
<td>11</td>
<td>DVPE</td>
<td>front-end</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pseudo-device</td>
</tr>
<tr>
<td>12</td>
<td>DVTY</td>
<td>terminal</td>
</tr>
<tr>
<td>13</td>
<td>DVPTY</td>
<td>pseudo-terminal</td>
</tr>
<tr>
<td>15</td>
<td>DVNUL</td>
<td>null device</td>
</tr>
<tr>
<td>16</td>
<td>DVNET</td>
<td>ARPA network</td>
</tr>
<tr>
<td>20-35</td>
<td>data mode in which device can be opened</td>
<td></td>
</tr>
<tr>
<td>B20</td>
<td>DV%M17</td>
<td>dump mode</td>
</tr>
<tr>
<td>B27</td>
<td>DV%M10</td>
<td>image mode</td>
</tr>
<tr>
<td>B35</td>
<td>DV%M0</td>
<td>normal mode</td>
</tr>
</tbody>
</table>

Generates an illegal instruction interrupt on error conditions below.

**DVCHR ERROR MNEMONICS:**
- DEVX1: invalid device designator
- DESX1: invalid source/destination designator
- DESX3: JFN is not assigned
- DESX4: invalid use of terminal designator or string pointer

### EFAC T  JSYS 5

*Makes an entry in the FACT file. The EFAC T monitor call is obsolete and provided only for existing programs that make entries in the FACT file. New programs should use the USAGE monitor call to make entries in the new USAGE file.*

**ACCEPTS IN AC1:**
- LH: negative size of entry
- RH: pointer to beginning of entry (size bits of entry will be updated by the system from the negative size specified)

**RETURNS**
- +1: failure, error code in AC1
- +2: success

The EFAC T call returns successfully without making an entry in the FACT file if the monitor flag SF%FAC (refer to SMON and TMON calls) is not set.

The EFAC T monitor call can be executed only by the monitor or by a process that has WHEEL or OPERATOR capability enabled.
TOPS-20 MONITOR CALLS (EPCAP)

Generates an illegal instruction interrupt on error conditions below.

EPCAP ERROR MNEMONICS:

FRKHX1: invalid process handle
FRKHX2: illegal to manipulate a superior process

ERSTR    JSYS 11

Translates a TOPS-20 error number to its corresponding text string and writes the string to the specified destination. This error number is the one returned in an AC (usually in AC1) on a JSYS error and is associated with a unique error mnemonic and text string. The error numbers begin at 600010 and are defined in the system file MONSYM.MAC. (Refer to Appendix A for the list of error numbers, mnemonics, and text strings.)

ACCEPTS IN AC1: destination designator

AC2: LH: process handle
RH: error number, or -1 for the most recent error in the specified process

AC3: LH: a negative count of the maximum number of bytes in the string to be transferred, or 0 for no limit
RH: 0

RETURNS
+1: failure, undefined error number
+2: failure, string size out of bounds or invalid destination designator
+3: success

Generates an illegal instruction interrupt on error conditions below.

ERSTR ERROR MNEMONICS:

DESX1: invalid source/destination designator
FRKHX1: invalid process handle
IOX11: quota exceeded or disk full
TOPS-20 MONITOR CALLS (ESOUT)

**ESOUT**  **JSYS 313**

Outputs an error string. This monitor call is used for reporting an error in the input from the primary input stream in order to cause re-synchronization of the input transaction. This mechanism is convenient for communication with a user who made a typing error and may have continued to type ahead. It also standardizes the format of error messages.

**ACCEPETS IN ACL:** pointer to a string in the caller's address space. The string is terminated with a null character.

**RETURNS** +1: always, updated string pointer in ACL

The ESOUT call waits for the primary output buffer to empty and then outputs a carriage return, line feed, and question mark to the primary output designator. Next it clears the primary input buffer and outputs the error string to the primary output designator.

Can cause several software interrupts or process terminations on certain file conditions. (Refer to bit OF%HER of the OPENF call description.)

**FFFP**  **JSYS 31**

Finds the first free page in the specified file. A free page is one that is marked as not being in use. The FFFFP call is useful for finding a nonused page in a file before a PMAP call is executed that writes into that page.

**ACCEPETS IN ACL:** JFN

**RETURNS** +1: always, with the JFN in the left half of ACL and the page number in the right half of ACL, or -1 if there is no free page.

Generates an illegal instruction interrupt on error conditions below.

**FFFP ERROR MNEMONICS:**

- **DESX1:** invalid source/destination designator
- **DESX3:** JFN is not assigned
- **DESX4:** illegal use of terminal designator or string pointer
- **DESX5:** file is not open

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When both B11(GJ%IFG) and B12(GJ%OFG) are on, the GTJFN call parses the specification given, verifying the existence of each field. When a wildcard character appears in a field, the GTJFN call checks the remaining fields for correct punctuation and returns a JFN for the file specification string only. That is, once a wildcard character is seen, the action taken is identical to that taken when only B12(GJ%OFG) is set. If no wildcard character appears in the string, the action is the same as if both bits were off.

Flags are to be returned in the left half of AC1 on a successful return.

User logical names specified for the current job are to be ignored and the physical device is to be used.

This bit is off in the short form of the GTJFN call.

The contents of AC2 are to be interpreted as follows:

1. If this bit is on, AC2 contains an input JFN in the left half and an output JFN in the right half. The input JFN is used to obtain the file specification to be associated with the JFN. The output JFN is used to indicate the destination for printing the names of any fields being recognized. To omit either JFN, specify .NULO (377777).

2. If this bit is off, AC2 contains a pointer to an ASCIZ string in memory that specifies the file to be associated with the JFN.

This bit must be on for the short form of the GTJFN call.

The following generation number of the file. The following values are permitted; however, 0 is the normal case.

0(.GJDEF) to indicate that the next higher generation number of the file is to be used if GJ%FOU (bit 0) is on, or to indicate that the highest existing generation number of the file is to be used if GJ%FOU is off.
TOPS-20 MONITOR CALLS (GTJFN)

18-35  (-1(.GJNHG)) to indicate that the next higher generation number of the file is to be used if no generation number is supplied.

(-2(.GJLEG)) to indicate that the lowest existing generation number of the file is to be used if no generation number is supplied.

(-3(.GJALL)) to indicate that all generation numbers (*) of the file are to be used and that the JFN is to be assigned to the first file in the group, if no generation number is supplied. (Bit GJ%IFG must be set.)

1-377777 to indicate that the specified generation number of the file is to be used if no generation number is supplied.

The GTJFN monitor call always reads the terminating character after the file specification string. (This character can be obtained by executing the BKJFN call followed by a BIN call.) The valid terminating characters are:

- line feed
- CTRL/L
- CTRL/Z
- carriage return
- exclamation point
- double quotation marks
- number sign
- ampersand
- single quotation mark
- left parenthesis
- right parenthesis
- plus sign
- comma
- slash
- equals sign
- at sign (@)
- space
- ESC

All of these characters except for ESC are also confirmation characters (refer to bit GJ%CFM above) and are called confirming terminators. If a confirming terminator is typed after the string, a confirmation message will not be typed to the user nor will the user be required to confirm the string obtained, regardless of the setting of GJ%MSG and GJ%CFM.

On a successful return, the following flags are returned in the left half of AC1 if flag bit GJ%IFG, GJ%OFG, or GJ%FLG was on in the call.

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TOPS-20 MONITOR CALLS (GTJFN)

GTJFN  JSYS 20
LONG FORM

Returns a JFN for the specified file. Accepts the specification for
the file from both a string in memory and from a file. If both are
given as arguments, the string is used first, and then the file is
used if more fields are needed to complete the specification. This
form also allows the program to specify nonstandard values to be used
for omitted fields and to request the assignment of a specific JFN.

ACCEPTS IN AC1: 0 in the left half, and address of the beginning of
the argument table in the caller's address space in
the right half

      AC2: pointer to ASCIZ file specification string in the
caller's address space, or 0 if none

GJFX34: invalid character "?" in file specification
GJFX35: directory access privileges required
GJFX36: internal format of directory is incorrect
GJFX37: input deleted
GJFX38: file not found because output-only device was specified
GJFX39: logical name loop detected
GJFX40: undefined attribute in file specification
GJFX41: file name must not exceed 6 characters
GJFX42: file type must not exceed 3 characters
GJFX43: more than one ;T specification is not allowed
GJFX44: account string does not match
GJFX45: illegal to request multiple specifications for the same
attribute
GJFX46: attribute value is required
GJFX47: attribute does not take a value
GJFX48: GTJFN input buffer is empty
GJFX49: invalid attribute for this device
GFX51: byte size too small
IOX11: quota exceeded or disk full
DE5X9: invalid operation for this device
RETURNS

+1: failure, error code in AC1
+2: success, flags in the left half of AC1, and the JFN assigned in the right half of AC1. (This word is called an indexable file handle and is given to the GNJFN call as an argument.) Updated string pointer in AC2, if pertinent.

All I/O errors can occur. These errors cause software interrupts or process terminations, and only a single return (+1) is given.

The format of the argument table specified by the right half of AC1 is described below. Words 0 through 10 (.GJGEN-.GJJFN) must be supplied in the long form of the GTJFN call. The remaining words are optional, and if they are supplied, B15(GJ%XTN) of word .GJGEN must be on.

<table>
<thead>
<tr>
<th>Word</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.GJGEN</td>
<td>Flag bits in the left half and generation number in the right half. (See below.)</td>
</tr>
<tr>
<td>1</td>
<td>.GJSRC</td>
<td>Input JFN in the left half and output JFN in the right half. To omit either JFN, specify .NULIO (377777).</td>
</tr>
<tr>
<td>2</td>
<td>.GJDEV</td>
<td>Pointer to ASCIZ string that specifies the default device to be used when none is given. If this word is 0, the user's connected structure will be used.</td>
</tr>
<tr>
<td>3</td>
<td>.GJDIR</td>
<td>Pointer to ASCIZ string that specifies the default directory to be used when none is given. If this word is 0, the user's connected directory will be used.</td>
</tr>
<tr>
<td>4</td>
<td>.GJNAM</td>
<td>Pointer to ASCIZ string that specifies the default filename to be used when none is given. If this word is 0, either the string or the input JFN must supply the filename.</td>
</tr>
<tr>
<td>5</td>
<td>.GJEXT</td>
<td>Pointer to ASCIZ string that specifies the default file type to be used when none is given. If this word is 0, the null file type will be used.</td>
</tr>
<tr>
<td>6</td>
<td>.GJPRO</td>
<td>Pointer to ASCIZ string that specifies the default protection to be used when none is given. If this word is 0, the default protection as specified in the directory or the protection of the next lower generation will be used.</td>
</tr>
<tr>
<td>7</td>
<td>.GJACT</td>
<td>Pointer to ASCIZ string that specifies the default account to be used when none is given. If this word is 0, the user's LOGIN account (unless changed) will be used.</td>
</tr>
<tr>
<td>10</td>
<td>.GJJFN</td>
<td>The JFN to associate with the file specification if flag GJ%JFN is set in word 0 (.GJGEN) of the argument block.</td>
</tr>
</tbody>
</table>
Extended argument block if B15(GJ%XTN) is on in the left half of .GJGEN. This word contains a second group of flags in the left half and the count of the number of words following this word in the argument block in the right half. The flags in the left half specify additional control over the GTJFN process. The following flags are defined:

B0(GJ%RND) Return to the caller if the filename buffer becomes empty, and the user attempts to delete a character. This can occur if the user, when giving the filename, types a CTRL/U or types a DELETE or CTRL/W and there are no more characters in the buffer.

B2(GJ%NLN) Filenames cannot be longer than 6 characters and file types cannot be longer than 3 characters. In addition, the generation number, temporary status, protection, and account fields cannot be specified in the string or input data.

B3(GJ%RCM) Return the confirmation message to the caller by placing it in the destination buffer.

B4(GJ%RIE) Return to the caller if the input buffer becomes empty, and the user attempts to delete a character.

Pointer to the exact copy of the user's typescript (destination string pointer). This string will contain logical names, if they were typed by the user, and will not contain the default fields unless they were generated through recognition. This string allows the caller to obtain a true copy of the user's typescript.

Number of bytes available in the destination string pointed to by .GTCPP (word 12). If a pointer has been specified but this word is 0, the monitor assumes the string contains 130 bytes.

Pointer to the buffer for text to be output when the user types a CTRL/R (i.e., pointer to the CTRL/R buffer). This pointer cannot be equal to the pointer given in AC2. (Refer to the TEXTI call for the definition of the CTRL/R buffer.)

Pointer to the beginning of the destination buffer.

Pointer to the file specification attribute block. This word is reserved for future use.
The flag bits accepted in the left half of .GJGEN (word 0) of the argument block are basically the same as those accepted in the short form of the GTJFN call. The entire set of bits is listed below. (Refer to GTJFN - SHORT FORM for more detailed explanations of these bits.) The flags that are different in the two forms are GJ%JFN, GJ%XTN, GJ%FNS, and GJ%SHT.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>GJ%FOU</td>
<td>Create a new version of the file.</td>
</tr>
<tr>
<td>1</td>
<td>GJ%NEW</td>
<td>The file must not exist.</td>
</tr>
<tr>
<td>2</td>
<td>GJ%OLD</td>
<td>The file must exist.</td>
</tr>
<tr>
<td>3</td>
<td>GJ%MSG</td>
<td>Type a message if the user presses ESC to terminate input.</td>
</tr>
<tr>
<td>4</td>
<td>GJ%CFM</td>
<td>Confirmation from the user is required.</td>
</tr>
<tr>
<td>5</td>
<td>GJ%TMP</td>
<td>The file is temporary.</td>
</tr>
<tr>
<td>6</td>
<td>GJ%NS</td>
<td>Search only the first specification in a multiple logical name definition.</td>
</tr>
<tr>
<td>7</td>
<td>GJ%ACC</td>
<td>The JFN cannot be accessed by inferior processes.</td>
</tr>
<tr>
<td>8</td>
<td>GJ%DEL</td>
<td>Ignore the file deleted bit in the FDB.</td>
</tr>
<tr>
<td>9-10</td>
<td>GJ%JFN</td>
<td>Associate the JFN supplied in .GJJFN (word 10) of the argument block with the file specification. The value of this field is interpreted as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 (.GJDNU)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 (.GJERR)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 (.GJALT)</td>
</tr>
<tr>
<td>11</td>
<td>GJ%IFG</td>
<td>The file specification can contain wildcard characters.</td>
</tr>
<tr>
<td>12</td>
<td>GJ%OFG</td>
<td>Associate the JFN with the file specification string and not the file itself.</td>
</tr>
<tr>
<td>13</td>
<td>GJ%FLG</td>
<td>Return flags in AC1 on successful completion of the call.</td>
</tr>
<tr>
<td>14</td>
<td>GJ%PHY</td>
<td>The physical device is to be used.</td>
</tr>
<tr>
<td>15</td>
<td>GJ%XTN</td>
<td>The argument block contains more than 10 (octal) words.</td>
</tr>
<tr>
<td>16</td>
<td>GJ%FNS</td>
<td>This bit is ignored for the long form of the GTJFN call.</td>
</tr>
<tr>
<td>17</td>
<td>GJ%SHT</td>
<td>This bit must be off for the long form of the GTJFN call.</td>
</tr>
</tbody>
</table>
TOPS-20 MONITOR CALLS (IIC)

IIC ERROR MNEMONICS:
- FRKHX1: invalid process handle
- FRKHX2: illegal to manipulate a superior process
- FRKHX3: invalid use of multiple process handle

INLNLM JSYS 503

Returns a logical name that is defined either for this job or for the system. (Refer to Section 2.2.2 and CRLNM and LNMST monitor calls.)

ACCEPTS IN AC1: function code in the left half, and index into the table of defined logical names in the right half
- AC2: pointer to the string for storing the logical name

RETURNS
- +1: failure, error code in AC1
- +2: success, updated string pointer in AC2

The available functions are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.INLJB</td>
<td>List the logical names defined for this job</td>
</tr>
<tr>
<td>1</td>
<td>.INLSY</td>
<td>List the logical names defined for the system</td>
</tr>
</tbody>
</table>

INLNLM ERROR MNEMONICS:
- INLNX1: index is beyond end of logical name table
- INLNX2: invalid function

JFNS JSYS 30

Returns the file specification currently associated with the JFN.

ACCEPTS IN AC1: destination designator where the ASCIZ string is to be written
- AC2: indexable file handle (refer to GTJFN), or pointer to string
- AC3: format control bits to be used when returning the string, or 0
- AC4: pointer to string containing prefix of file specification attribute

RETURNS
- +1: always, updated string pointer, if pertinent, in AC1
AC2 can have one of two formats, depending on B26(JS\%PTR) in AC3. The first format is a word with either 0 or the flag bits returned from GTJFN in the left half and the JFN in the right half. When the left half is 0, the string returned is the exact specification associated with the JFN. If the given JFN is associated only with a file specification (i.e., it was obtained with B12(GJ\%OFG) on in the GTJFN call), the string returned contains null fields for nonexistent fields or fields containing wildcards, and actual values for existent fields. When the left half is nonzero, the string returned contains wildcard characters for appropriate fields and 0, -1, or -2 as a generation number if the corresponding bit is on in the call.

The second format (allowed only if B26(JS\%PTR) of AC3 is on) is a pointer to the string to be returned. This string is one field of a file specification. The field is determined by the first nonzero 3-bit field in AC3 or by the setting of B27(JS\%ATR) or B28(JS\%AT1) in AC3. For example, if bits 6-8 (JS\%NAM) of AC3 are nonzero, then the string is interpreted as a filename field. If B27(JS\%ATR) is on, the string is interpreted as a file specification attribute. If B28(JS\%AT1) is on, the string is concatenated to the string pointed to by AC4, and a colon is inserted between the two strings. In all cases, the string is output to the destination designator, and the appropriate punctuation is added.

AC3 contains control bits for formatting the string being returned. B0-B20 are divided into 3-bit bytes, each byte representing a field in the file specification. The value of the byte indicates the output for that field. The values are:

0 (.JSNOF) do not output this field
1 (.JSAOF) always output this field
2 (.JSSSD) suppress this field if it is the system default

The bits that can be set in AC3 are as follows:

B0-B2 (JS\%DEV) output for device field
B3-B5 (JS\%DIR) output for directory field
B6-B8 (JS\%NAM) output for filename field (2 is illegal)
B9-B11 (JS\%YP) output for file type field (2 is illegal)
B12-B14 (JS\%GEN) output for generation number field
B15-B17 (JS\%PRO) output for protection field
B18-B20 (JS\%ACT) output for account field
B21 (JS\%TMP) return ;T if appropriate
B22 (JS\%SZ) return size of file in pages
B23 (JS\%CDR) return creation date
B24 (JS\%LWR) return date of last write
B25 (JS\%LRD) return date of last read
B26 (JS\%PTR) AC2 contains pointer to the string being returned
B27 (JS\%ATR) return file specification attributes if appropriate
B28 (JS\%AT1) return the specific specification attribute whose prefix is indicated by the string pointed to in AC4. This bit is used when a program is processing attributes one at a time. If JS\%ATR is also set, all attributes will be returned.
B32 (JS\%PSD) punctuate the size and date fields
B33 (JS\%TBR) tab before all fields returned, except for first field
B34 (JS\%TBP) tab before all fields that may be returned (i.e., fields whose value is given as 1 or 2), except for first field
B35 (JS\%PAF) punctuate all fields from device through ;T
TOPS-20 MONITOR CALLS (MRECV)

IPCF31: invalid page number
IPCF32: page is not private
IPCF34: cannot receive into an existing page

MSEND JSYS 510

Sends an IPCF (Inter-Process Communication Facility) message. The message is in the form of a packet and can be sent to either the specified PID or the system process <SYSTEM>INFO. Refer to the DECsystem-20 Monitor Calls User's Guide for an overview and description of the Inter-Process Communication Facility.

ACCEPTS IN AC1: length of packet descriptor block

AC2: address of packet descriptor block

RETURNS
+1: failure, error code in AC1
+2: success. The packet is sent to the receiver's input queue. Word .IPCFS of the packet descriptor block is updated with the sender's PID. This updating is done in case the PID was being defaulted or created by this call.

The format of the packet descriptor block is as follows:

<table>
<thead>
<tr>
<th>Word</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.IPCFL</td>
<td>Flags. (See below.)</td>
</tr>
<tr>
<td>1</td>
<td>.IPCFS</td>
<td>PID of sender, or 0 if no PID exists for sender. This word will be 0 if the caller is creating a PID (i.e., flag bit IP%CPD is on).</td>
</tr>
<tr>
<td>2</td>
<td>.IPCFR</td>
<td>PID of receiver, or 0 if receiver is &lt;SYSTEM&gt;INFO.</td>
</tr>
<tr>
<td>3</td>
<td>.IPCPP</td>
<td>Pointer to message block (length of message in the left half and starting address of message in the right half). When a packet is sent to &lt;SYSTEM&gt;INFO, the message block contains the request being made. (See below.)</td>
</tr>
</tbody>
</table>

The following flags are defined in word .IPCFL of the packet descriptor block. These flags can be set on both the MSEND and MRECV calls.

Flags Set By Caller

B0(IP%CFB) Do not block process if there are no messages in the queue. If this bit is set, an error is given if there are no messages.

B1(IP%CFS) Use, as the sender's PID, the PID obtained from the address specified in word .IPCFS.
TOPS-20 MONITOR CALLS(MSEND)

B2(IP%CFR) Use, as the receiver's PID, the PID obtained from the address specified in word .IPCPR.

B3(IP%CFO) Allow one send request above the quota. (The default send quota is 2.)

B4(IP%TTL) Truncate the message, if it is larger than the space reserved. If this bit is not set, an error is given if the message is too large.

B5(IP%CPD) Create a PID to use as the sender's PID and return it in word .IPCFS of the packet descriptor block.

B6(IP%JWP) Make the created PID be job wide (i.e., permanent until the job logs out). If this bit is not set, the PID is temporary until the process executes the RESET monitor call. If B5(IP%CPD) is not set, B6 is ignored.

B7(IP%NOA) Do not allow other processes to use the created PID. If B5(IP%CPD) is not set, B7 is ignored.

B18(IP%CFP) The packet is privileged. (This bit can be set only by a process with WHEEL capability enabled.) When a privileged sender sets this bit, the MRECV and MUTIL calls return it set for any reply. An error is given if this bit is set by the sender and the receiver is not privileged.

B19(IP%CFV) The packet is a page of data. Word .IPCFP of the packet descriptor block contains 1000 in the left half and the page number in the right half. The page the packet is being sent to, or is being received into, must be private.

Flags Returned After Call

B20(IP%CFZ) A zero-length message was sent, and the packet consists of only the packet descriptor block.

B24-B29 (IP%CFE) Error code field for errors encountered by <SYSTEM>INFO during a send or receive request.

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>.IPCPU</td>
<td>insufficient privileges</td>
</tr>
<tr>
<td>16</td>
<td>.IPCUF</td>
<td>invalid function</td>
</tr>
<tr>
<td>67</td>
<td>.IPCFS</td>
<td>&lt;SYSTEM&gt;INFO needs name</td>
</tr>
<tr>
<td>72</td>
<td>.IPCFF</td>
<td>&lt;SYSTEM&gt;INFO free space exhausted</td>
</tr>
<tr>
<td>74</td>
<td>.IPCBP</td>
<td>PID has no name or is invalid</td>
</tr>
<tr>
<td>75</td>
<td>.IPCDD</td>
<td>duplicate name has been specified</td>
</tr>
<tr>
<td>76</td>
<td>.IPCNN</td>
<td>unknown name has been specified</td>
</tr>
<tr>
<td>77</td>
<td>.IPCNN</td>
<td>invalid name has been specified</td>
</tr>
</tbody>
</table>

B30-B32 (IP%CFC) System and sender code. This code can be set only by a process with WHEEL capability enabled. The system returns the code so that a nonprivileged user can examine it.

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.IPCCC</td>
<td>sent by &lt;SYSTEM&gt;IPCF</td>
</tr>
<tr>
<td>2</td>
<td>.IPCCF</td>
<td>sent by system-wide &lt;SYSTEM&gt;INFO</td>
</tr>
<tr>
<td>3</td>
<td>.IPCCC</td>
<td>sent by receiver's &lt;SYSTEM&gt;INFO</td>
</tr>
</tbody>
</table>

3-126
2 .MSTFL

Flag bits in the left half, and the number of units in the structure (.MSTNU) in the right half. The bits that can be set in the left half are:

B0(MS%NFH) If one of the HOME blocks is incorrect, do not fix it and do return an error. If this bit is off and one of the HOME blocks is incorrect, the correct block is copied into the bad HOME block and the mounting procedure continues.

B1(MS%NFB) If one of the BAT (Bad Allocation Table) blocks is incorrect, do not fix it and do return an error. If this bit is off and one of the BAT blocks is incorrect, the correct block is copied into the bad BAT block and the mounting procedure continues.

B2(MS%XCL) Mount the structure for exclusive use by this job. This bit is set by a system program when it initializes or reconstructs a structure. If this bit is off, the structure is mounted for general use.

B3(MS%IGN) Ignore correctable errors in the bit table and in the root directory on this structure. This bit is set by a system program when it reconstructs the root directory on a structure or rebuilds the bit table. If this bit is off and an error is detected, this function returns an error.

3 .MSTUI

Beginning of unit information for each unit in the structure. The information is 3 words long per unit, and the symbol for this length is .MSTNO. The first 3-word block is for logical unit 0, and the last 3-word block is for the last logical unit (.MSTNU-1). The offsets into the 3-word block are:

0 .MSTCH Channel number of unit
1 .MSTCT Controller number of unit (currently must be -1)
2 .MSTUN Unit number of unit

After successful completion of this function, the given structure is mounted and available for general use (unless bit MS%XCL was on in word .MSTFL of the argument block).
The following errors are possible on the failure of this function.

- **MSTRX2**: WHEEL or OPERATOR capability required
- **MSTRX3**: argument block too small
- **MSTRX4**: insufficient system resources
- **MSTRX5**: drive is not on line
- **MSTRX6**: home blocks are bad
- **MSTRX7**: invalid structure name
- **MSTRX8**: could not get OFN for ROOT-DIRECTORY
- **MSTRX9**: could not MAP ROOT-DIRECTORY
- **MSTX10**: ROOT-DIRECTORY bad
- **MSTX11**: could not initialize Index Table
- **MSTX12**: could not OPEN Bit Table File
- **MSTX13**: backup copy of ROOT-DIRECTORY is bad
- **MSTX14**: invalid channel number
- **MSTX15**: invalid unit number
- **MSTX16**: invalid controller number
- **MSTX17**: all units in a structure must be of the same type
- **MSTX19**: unit is already part of a mounted structure
- **MSTX20**: data error reading HOME blocks
- **MSTX23**: could not write HOME blocks
- **MSTX25**: invalid number of swapping pages
- **MSTX27**: specified unit is not a disk
- **MSTX30**: incorrect Bit Table counts on structure
- **MSTX34**: unit is write-locked
- **MSTX35**: too many units in structure
- **MONX01**: insufficient system resources

**Dismounting a Given Structure - .MSDIS**

This function indicates that the given structure can be removed from the system. Any mounted structure other than the public structure PS: can be dismounted with this function. (The public structure PS: is dismounted at system shutdown.)
TOPS-20 MONITOR CALLS(MSTR)

The format of the argument block is as follows:

<table>
<thead>
<tr>
<th>Word</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.MSUAL</td>
<td>Pointer to ASCIZ string containing the alias of the structure, or device designator of the structure.</td>
</tr>
<tr>
<td>1</td>
<td>.MSUFL</td>
<td>Flag bits in the left half and 0 in the right half. The bits that can be set are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B0(MS%GTA) Return users who have accessed the structure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B1(MS%GTM) Return users who have incremented the mount count.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B2(MS%GTC) Return users who are connected to the structure.</td>
</tr>
</tbody>
</table>

After successful execution of this function, word 1 through word n+1 (where n is the number of items returned) are updated with the following information.

<table>
<thead>
<tr>
<th>Word</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.MSUFL</td>
<td>Right half contains the number of items (n) being returned. Left half is unchanged.</td>
</tr>
<tr>
<td>2</td>
<td>.MSUJ1</td>
<td>Flag bits for the job in the left half, and number of job in the right half.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n+1</td>
<td></td>
<td>Flag bits for the job in the left half, and number of job in the right half.</td>
</tr>
</tbody>
</table>

The bits returned for each job are defined as:

| B0(MS%GTA) | Job has accessed structure. |
| B1(MS%GTM) | Job has incremented the mount count for structure. |
| B2(MS%GTC) | Job has connected to structure. |

The following errors are possible on the failure of this function.

- MSTRX1: invalid function
- MSTRX3: argument block too small
- STRX01: structure is not mounted
- STDVX1: no such device
- ARGX18: invalid structure name
- MONX01: insufficient system resources
TOPS-20 MONITOR CALLS (MSEND)

Specifying word and bits to be modified - .MSHOM

This function allows enabled WHEEL or OPERATOR program to specify word of homeblock of mounted structure to be modified, which bits should be modified, and what the new values should be.

The format of the argument block is as follows:

<table>
<thead>
<tr>
<th>Word</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.MSHNM</td>
<td>Handle on alias such as pointer to string, or device designator.</td>
</tr>
<tr>
<td>1</td>
<td>.MSHOF</td>
<td>Offset specifying which word should be changed.</td>
</tr>
<tr>
<td>2</td>
<td>.MSHVL</td>
<td>Value for new bits.</td>
</tr>
<tr>
<td>3</td>
<td>.MSHMK</td>
<td>Mask showing which bits should be changed.</td>
</tr>
</tbody>
</table>

The following errors are possible on the failure of this function:

- MSTRX2: insufficient privileges
- MSTRX3: argument block too small
- MSTX21: structure not mounted

Any errors "MODHOM" routine returns

MTALN JSYS 774

Associates a given serial-numbered magnetic tape drive with the specified logical unit number. This monitor call requires the process to have WHEEL or OPERATOR capability enabled. The MTALN call is a temporary call and may not be defined in future releases.

ACCEPTS IN AC1: slave type in left half; logical unit number of magtape in right half

AC2: decimal serial number of magnetic tape drive

RETURNS +1: always

All units are searched for the specified serial number and slave type. When they are found, the drive is associated with the given logical unit number. The original unit is now associated with the logical unit number that the specified serial-numbered drive had before it was reassigned.

The slaves recognized are

- .MTT45 TU45 (The system default)
- .MTT70 TU70
- .MTT71 TU71
- .MTT72 TU72

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TOPS-20 MONITOR CALLS (MTALN)

Generates an illegal instruction interrupt on error conditions below.

MTALN ERROR MNEMONICS:

WHELX1: WHEEL or OPERATOR capability required
DEVX1: invalid device designator
OPNX7: device already assigned to another job

MTOPR  JSYS 77

Performs various device-dependent control functions. This monitor call requires that the device either be opened or be assigned to the caller if the device is an assignable device.

Because of the device dependencies of the MTOPR call, programs written with device-independent code should not use this call unless they first check for the type of device.

ACCEPTS IN AC1: JFN of the device
        AC2: function code (see below)
        AC3: function arguments or address of argument block (see descriptions of individual devices)

RETURNS +1: always

The functions listed for each device apply only to that device. If a function applies to more than one device, its description is repeated for each applicable device.

MTA Functions

The functions available for magnetic tapes (MTA) are described below. Some of these functions accept arguments in AC3 (refer to the individual descriptions).

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.MOCLE</td>
<td>Clear any error flags from a previous MTOPR call.</td>
</tr>
<tr>
<td>31</td>
<td>.MONOP</td>
<td>Wait for all activity to stop.</td>
</tr>
<tr>
<td>1</td>
<td>.MOREW</td>
<td>Rewind the tape. This function waits for activity to stop before winding the tape. If sequential data is being output, the last partial buffer is written before the tape is rewound. Control returns to caller when rewinding begins.</td>
</tr>
<tr>
<td>11</td>
<td>.MORUL</td>
<td>Rewind and unload the tape. This function is identical to the .MOREW function and also unloads the tape if the hardware supports tape unloading.</td>
</tr>
<tr>
<td>10</td>
<td>.MOEOT</td>
<td>Advance forward until two sequential tape marks are seen and position tape after the first tape mark.</td>
</tr>
</tbody>
</table>
TOPS-20 MONITOR CALLS (MTOPR)

3 .MO EOF
Write a tape mark. This function requires that the magnetic tape be opened for write access. If sequential data is being output, the last partial buffer is written before the tape mark.

6 .MOPWR
Advance over one record in the direction away from the beginning of the tape. If sequential data is being read in the forward direction and not all of the record has been read, this function advances to the start of the next record. If sequential data is being read in the reverse direction and not all of the record has been read, this function positions the tape at the end of that record.

7 .MOBKR
Space backward over one record in the direction toward the beginning of the tape. If sequential data is being read in the forward direction and not all of the record has been read, this function positions the tape back to the start of that record. If sequential data is being read in the reverse direction and not all of the record has been read, this function positions the tape to the end of the record physically preceding that record.

16 .MOPWF
Advance to the start of the next file. This function advances the tape in the direction away from the beginning of the tape until it passes over a tape mark.

17 .MOBKF
Space backward over one file. This function moves the tape in the direction toward the beginning of the tape until it passes over a tape mark or reaches the beginning of the tape, whichever occurs first.

2 .MOSDR
Set the direction of the tape motions for read operations. This function requires AC3 to contain the desired direction. If AC3 = 0, the tape motion is forwards; if AC3 = 1, the tape motion is backwards.

26 .MORDR
Return the direction that the tape is moving during read operations. On a successful return, AC3 = 0 if the direction of the tape motion is forwards, or AC3 = 1 if the direction of the tape motion is backwards.

5 .MOSRS
Set the size of the records. This function requires AC3 to contain the desired number of bytes in the records.

15 .MORRS
Return the size of the records. On a successful return, AC3 contains the number of bytes in the records.
TOPS-20 MONITOR CALLS (MTOPR)

24 .MOSDN Set the density. The function requires AC3 to contain the desired density:

0 .SJDDN  default system density
1 .SJDN2  200 BPI (8 rows/mm)
2 .SJDN5  556 BPI (22 rows/mm)
3 .SJDN8  800 BPI (31 rows/mm)
4 .SJD16  1600 BPI (63 rows/mm)
5 .SJD62  6250 BPI (246 rows/mm)

12 .MORDN Return the current density setting. On a successful return, AC3 contains the current density.

4 .MOSDM Set the hardware data mode to be used when transferring data to and from the tape. This function requires AC3 to contain the desired data mode:

0 .SJDDM  default system data mode
1 .SJDMC  dump mode (36-bit bytes)
2 .SJDM6  SIXBIT byte mode for 7-track drives
3 .SJDMA  ANSI ASCII mode (7 bits in 8-bit bytes)
4 .SJDM8  industry compatible mode
5 .SJDMH  High-density mode for TU70 and TU72 tape drives only (nine 8-bit bytes in two words).

14 .MORDM Return the hardware data mode currently being used in transfers to and from the tape. On a successful return, AC3 contains the current data mode.

20 .MOSPR Set the parity. This function requires AC3 to contain the desired parity:

0 .SJPRO  odd parity
1 .SJPRE  even parity

21 .MORPR Return the current parity. On a successful return, AC3 contains the current parity.

27 .MOSID Set the reel identification of the tape mounted. The process must have WHEEL or OPERATOR capability enabled. This function requires AC3 to contain the desired 36-bit reel ID.
FE Functions

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>.MOEOP</td>
<td>Send an end of file to the program using the FE device on the front end. This function is used for synchronization between a program running on the DECSYSTEM-20 and a program running on the front end.</td>
</tr>
<tr>
<td>4</td>
<td>.MODTE</td>
<td>Assign the specified device to the DTE controller on the front end. This function, which must be performed before I/O is allowed to the device, requires AC3 to contain the device type. The process must have WHEEL or OPERATOR capability enabled.</td>
</tr>
</tbody>
</table>

TTY Functions

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>.MOPIH</td>
<td>Determine if TTY job needs input. On a successful return, AC2 contains 0 (.MONWI) if TTY job is not waiting for input or contains -1 (.MOWFI) if TTY job is waiting for input.</td>
</tr>
<tr>
<td>26</td>
<td>.MOSPD</td>
<td>Set the terminal line speed. This function accepts in AC3 the desired line speed (input speed in the left half and output speed in the right half). The left half of AC2 contains flag bits indicating the type of line being set. If BO (MO%RMT) is on, the line is a remote (dataset) line. If Bl (MO%AUT) is on, the line is a remote autobaud line (i.e., is automatically set at 300 baud, and the contents of AC3 are ignored. The process must have WHEEL or OPERATOR capability enabled to set BO (MO%RMT) and Bl (MO%AUT).</td>
</tr>
<tr>
<td>27</td>
<td>.MORSE</td>
<td>Return the terminal line speed. On a successful return, the left half of AC2 contains flag bits indicating the type of line, and AC3 contains the speed (input speed in the left half and output speed in the right half). If BO (MO%RMT) of AC2 is on, the line is a remote line, and if Bl (MO%AUT) is on, the line is a remote autobaud line. AC3 contains the speed or contains -1 if the speed is unknown or is not applicable.</td>
</tr>
<tr>
<td>30</td>
<td>.MORLW</td>
<td>Return the terminal page width. On a successful return, AC3 contains the width.</td>
</tr>
<tr>
<td>31</td>
<td>.MOSLL</td>
<td>Set the terminal page width. This function requires AC3 to contain the desired width.</td>
</tr>
<tr>
<td>32</td>
<td>.MORLL</td>
<td>Return the terminal page length. On a successful return, AC3 contains the length.</td>
</tr>
<tr>
<td>33</td>
<td>.MOSLL</td>
<td>Set the terminal page length. This function requires AC3 to contain the desired length.</td>
</tr>
<tr>
<td>34</td>
<td>.MOSNT</td>
<td>Specify if terminal line given in AC1 is to receive system messages. This function requires AC3 to contain 0 (.MOSMY) to allow messages or 1 (.MOSMN) to suppress messages.</td>
</tr>
</tbody>
</table>
TOPS-20 MONITOR CALLS (MTOPR)

35 .MORNT Return a code indicating if terminal line given in AC1 is to receive system messages. On a successful return, AC3 contains 0 (.MOSMY) if messages are being sent to this line or 1 (.MOSMN) if messages are being suppressed to this line.

36 .MOSIG Specify if input on this terminal line is to be ignored when the line is inactive (i.e., is not assigned or opened). This function requires AC3 to contain 0 if characters on this line are not to be ignored or 1 if characters on this line are to be ignored. When input is being ignored and characters are typed, no CTRL/G (bell) is sent, as is the normal case when characters are typed on an inactive line.

The functions available for DECnet-20 are described below. For a complete description of their application, refer to the TOPS-20 DECnet-20 Programmer's Guide and Operations Manual.

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>.MOACN</td>
<td>Allow a network task to enable software interrupt channels for any combination of the following work types:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o connect event pending</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o interrupt message available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o data available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This function requires that AC3 contain three 9-bit fields specifying the changes in the interrupt assignments for this link. These fields are</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Field Symbol Used to Signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B0-B8 MO%CDN Connect event pending</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B9-B17 MO%INA Interrupt message available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B18-B26 MO%DAV Data available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The contents of the fields are</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value Meaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>nnn The number of the channel to be enabled; 0-5 and 23-35 decimal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.MOCIA Clear the interrupt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.MONCI No change</td>
</tr>
<tr>
<td>25</td>
<td>.MORLS</td>
<td>Read the link status and return a 36-bit word of information regarding the status of the logical link. AC3 contains flag bits in the left half and a disconnect code in the right half. The flag bits are</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Symbol Bit Meaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MO%CON B0 Link is connected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MO%SRV B1 Link is a server</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MO%WFC B2 Link is waiting for a connect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MO%WCC B3 Link is waiting for a connect confirm</td>
</tr>
</tbody>
</table>

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TOPS-20 MONITOR CALLS (MTOPR)

MO%EOM B4 Link has an entire message to be read
MO%ABT B5 Link has been aborted
MO%SYN B6 Link has been closed normally
MO%INT B7 Link has an interrupt message available
MO%LWC B8 Link has been previously connected

The disconnect/reject codes are as follows:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>.DCX0</td>
<td>0</td>
<td>No special error</td>
</tr>
<tr>
<td>.DCX1</td>
<td>1</td>
<td>Resource allocation failure</td>
</tr>
<tr>
<td>.DCX2</td>
<td>2</td>
<td>Destination node does not exist</td>
</tr>
<tr>
<td>.DCX3</td>
<td>3</td>
<td>Node shutting down</td>
</tr>
<tr>
<td>.DCX4</td>
<td>4</td>
<td>Destination process does not exist</td>
</tr>
<tr>
<td>.DCX5</td>
<td>5</td>
<td>Invalid name field</td>
</tr>
<tr>
<td>.DCX11</td>
<td>11</td>
<td>User abort (asynchronous disconnect)</td>
</tr>
<tr>
<td>.DCX32</td>
<td>32</td>
<td>Too many connections to node</td>
</tr>
<tr>
<td>.DCX33</td>
<td>33</td>
<td>Too many connections to destination process</td>
</tr>
<tr>
<td>.DCX34</td>
<td>34</td>
<td>Access not permitted</td>
</tr>
<tr>
<td>.DCX35</td>
<td>35</td>
<td>Logical link services mismatch</td>
</tr>
<tr>
<td>.DCX36</td>
<td>36</td>
<td>Invalid account</td>
</tr>
<tr>
<td>.DCX37</td>
<td>37</td>
<td>Segment size too small</td>
</tr>
<tr>
<td>.DCX38</td>
<td>38</td>
<td>Process aborted</td>
</tr>
<tr>
<td>.DCX39</td>
<td>39</td>
<td>No path to destination node</td>
</tr>
<tr>
<td>.DCX40</td>
<td>40</td>
<td>Link aborted due to data loss</td>
</tr>
<tr>
<td>.DCX41</td>
<td>41</td>
<td>Destination process does not exist</td>
</tr>
<tr>
<td>.DCX42</td>
<td>42</td>
<td>Confirmation of DISCONNECT INITIATE</td>
</tr>
<tr>
<td>.DCX43</td>
<td>43</td>
<td>Image data field too long</td>
</tr>
</tbody>
</table>

If a disconnect code does not apply to the current status of the link, the right half of AC3 will be zeros.

26 MORHN

Return the ASCII name of the host node at the other end of the logical link. This function requires that AC3 contain a string pointer to the location where the host name is to be stored. (If the byte size exceeds eight bits, bytes are truncated to eight bits.)

The monitor call returns with an updated pointer in AC3, and the host name stored as specified.

27 MORTN

Return the unique task name that is associated with your end of the logical link. If you had defaulted the task name in the network file specification, the call returns the monitor-supplied task name. In DECnet-20, the default task name is actually a unique number.
TOPS-20 MONITOR CALLS (MTOPR)

This function requires that AC3 contain a string pointer to the location where the task name is to be stored. (If the byte size exceeds eight bits, bytes are truncated to eight bits.)

The monitor call returns with an updated pointer in AC3 and the task name stored as specified.

30 .MORUS

Return the source task user identification supplied in the connect initiate message. This function requires that AC3 contain a string pointer to the location where the user identification is to be stored. (If the byte size exceeds eight bits, bytes are truncated to eight bits.)

The monitor call returns with an updated pointer in AC3 and the user identification stored as specified. If no user identification was supplied by the source task, AC3 continues to point to the beginning of the string, and a null is returned as the only character.

31 .MORPW

Return the source task's password as supplied in the connect initiate message. This function requires that AC3 contain a string pointer to the location where the password is to be stored. (Passwords are binary, therefore the string pointer should accommodate 8-bit bytes.)

The monitor call returns with an updated pointer in AC3 and the source task's password stored as specified. AC4 contains the number of bytes in the string; a zero value indicates that no password was supplied by the source task.

32 .MORAC

Return the account string supplied by the source task in the connect initiate message. This function requires that AC3 contain a string pointer to the location where the account string is to be stored. (If the byte size exceeds eight bits, bytes are truncated to eight bits.)

The monitor call returns with an updated pointer in AC3 and the source task's account number stored as specified. If no account string was supplied by the source task, AC3 continues to point to the beginning of the string, and a null is returned as the only character.

33 .MORDA

Return the optional data supplied in any of the connect or disconnect messages. This function requires that AC3 contain a string pointer to the location where the optional user data is to be stored. (This file is binary; the string pointer should specify 8-bit bytes.)

The monitor call returns with an updated pointer in AC3 and the optional data stored as specified. AC4 contains the number of bytes in the data string; a zero value indicates that no optional data was supplied.

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Return the object type that was used by the source task to address this connection. The result indicates whether the local task was addressed by its generic type or its unique network task name.

The monitor call returns with the object type is AC3. A zero object type indicates that the target task was addressed by its unique network task name; a nonzero value indicates that it was addressed by its generic object type.

Read interrupt message. This function requires that AC3 contain a byte pointer to the receiving buffer. (If the byte size exceeds eight bytes, bytes are truncated to eight bits.) The maximum message length is 16 bytes, and the buffer size should be at least 8 bits.

The monitor call returns with an updated pointer in AC3, the message stored in the buffer, and the count of bytes received in AC4.

Send an interrupt message. This function requires that AC3 contain a byte pointer to the message (eight bytes maximum) and the AC4 contain a count of the bytes in the interrupt message (sixteen bytes maximum).

Return the unique identification of the source task. This identification is in the format of object-descriptor, and the contents depend on the DECnet implementation on the remote host. In addition, if the source task is running on a system that provides for group and user codes, this information is also returned. If the source task name is on a DECnet-20 host, the data returned is TASK-taskname. This function requires that AC3 contain a string pointer to the location where the object-descriptor of the source task is to be stored. (If the byte size exceeds eight bytes, bytes are truncated to eight bits.)

The monitor call returns with an updated pointer in AC3 and the object-descriptor stored as specified. In addition, if the source host system uses group and user codes (sometimes referred to as project and programmer number or p,pn), AC4 contains the group code in the left half and the user code in the right half. If the source host system does not provide for group or user codes, AC4 contains zeros.

Reject a connection either implicitly or explicitly. If the target task closes its JFN (via the CLOSF monitor call) before accepting the connection either implicitly or explicitly, the local NSM assumes that the connection is rejected and sends a connect reject message back to the source task. The reason given is process aborted (reject code 38). The target task must the reopen its JFN in order to receive subsequent connect initiate messages.
In order to explicitly reject a connect and at the same time return a specific reject reason and set up 16 bytes of user data, the target task must use the .MOCLZ function of the MTOPR monitor call. The .MOLCZ function does not close the JFN. This function requires that

AC2 contain a reject code in the left half and .MOCLZ in the right half. The reject code is a 2-byte, NSP-defined decimal number indicating the reason that a target task is rejecting a connection. Refer to the description of code 25, .MORLS, for a list of disconnect/reject codes.

AC3 contain a string pointer to any data to be returned. (If the byte size exceeds eight bits, bytes are truncated to eight bits.)

AC4 contain the count of bytes in the data string (maximum=16). A zero indicates no data

Accept a connection either implicitly or explicitly. Under certain conditions, the local NSP assumes that the connection is accepted and sends a connect confirm message back to the source task. These implicit conditions are

The target task attempts to output to the logical link (issues a SOUT or SOUTR monitor call to the network).

The target task submits a read request to the logical link (issues a SIN or SINR monitor call to the network).

The target task is in input wait state (has enabled itself for a "data available" software interrupt).

In order to explicitly accept a connect and also return a limited amount of data, the target task must use the .MOCC function of the MTOPR monitor call. This function requires that AC3 contain a string pointer to any data to be returned. (If byte size exceeds eight bits, bytes are truncated to eight bits.) AC4 must contain the count of bytes in the data string to a maximum of 16 bytes. A zero indicates no data.

Returns the maximum segment size that can be sent over this link. This value is the lesser of the maximum segment sizes supported by the remote NSP task and the remote network task. The local task can use this value to optimize the format of data being transmitted over the link.

The monitor call returns the maximum segment size, in bytes, in AC3.
TOPS-20 MONITOR CALLS (MTOPR)

Generates an illegal instruction interrupt on error conditions below.

MTOPR ERROR MNEMONICS:

DESX1: invalid source/destination designator
DESX2: terminal is not available to this job
DESX3: JFN is not assigned
DESX4: invalid use of terminal designator or string pointer
DESX5: file is not open
IOX5: device or data error
MTOX1: invalid function
MTOX2: record size was not set before I/O was done
MTOX3: function not legal in dump mode
MTOX4: invalid record size
MTOX5: invalid hardware data mode for magnetic tape
MTOX6: invalid magnetic tape density
MTOX7: WHEEL or OPERATOR capability required
MTOX8: argument block too long
MTOX9: output still pending
MTOX10: VFU or RAM file cannot be OPENed
MTOX11: data too large for buffers
MTOX12: input error or not all data read
MTOX13: argument block too small
MTOX14: invalid software interrupt channel number
MTOX15: device does not have Direct Access (programmable) VFU
TOPS-20 MONITOR CALLS (MUTIL)

IPCFX4: receiver's PID invalid
IPCFX5: receiver's PID disabled
IPCFX6: send quota exceeded
IPCFX7: receiver quota exceeded
IPCFX8: IPCF free space exhausted
IPCFX9: sender's PID invalid
IPCF10: WHEEL capability required
IPCF11: WHEEL or IPCF capability required
IPCF12: no free PID's available
IPCF13: PID quota exceeded
IPCF14: no PID's available to this job
IPCF15: no PID's available to this process
IPCF16: receive and message data modes do not match
IPCF17: argument block too small
IPCF18: invalid MUTIL JSYS function
IPCF19: no PID for [SYSTEM]INFO
IPCF20: invalid process handle
IPCF21: invalid job number
IPCF22: invalid software interrupt channel number
IPCF23: [SYSTEM]INFO already exists
IPCF24: invalid message size
IPCF25: PID does not belong to this job
IPCF26: PID does not belong to this process
IPCF27: PID is not defined
IPCF28: PID not accessible by this process
IPCF29: PID already being used by another process
IPCF30: job is not logged in
IPCF32: page is not private
IPCF33: invalid index into system PID table
IPCF35: invalid IPCF quota
TOPS-20 MONITOR CALLS (NIN)

NIN JSYS 225

Inputs an integer number, with leading spaces ignored. This call terminates on the first character not in the specified radix. If that character is a carriage return followed by a line feed, the line feed is also input.

ACCEPTS IN AC1: source designator

AC3: radix (2-10) of number being input

RETURNS +1: failure, error code in AC3, updated string pointer, if pertinent, in AC1

+2: success, number in AC2 and updated string pointer, if pertinent, in AC1

NIN ERROR MNEMONICS:

IFIXX1: radix is not in range 2 to 10

IFIXX2: first nonspace character is not a digit

IFIXX3: overflow (number is greater than 2**35)

DESX1: invalid source/destination designator

DESX2: terminal is not available to this job

DESX3: JFN is not assigned

DESX5: file is not open

NODE JSYS 567

Performs the following network utility functions: set local node name, get local node name, set local node number, get local node number, set loopback port, clear loopback port, and find loopback port.

ACCEPTS IN AC1: function code

AC2: address of argument block

RETURNS +1: always. If an error occurs, an illegal instruction trap is generated.

The available functions and their argument blocks are described below.

0 .NDSLN Set local node name

Argument Block

0 .NDNOD Pointer to ASCIZ node name.

1 .NDGLN Get local node name

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TOPS-20 MONITOR CALLS (NODE)

Argument Block
0 .NDNOD  Pointer to destination for ASCIZ name of local node.

2 .NDSNM  Set local node number
Argument Block
0  Number to set (greater than 2, less than 127)

3 .NDGNM  Get local node number.

4 .NDSLTP  Set loopback port\(^1\)
Argument Block
0  .NDPRT  NSP port number.
1  .BTLID  Pointer to line id.

5 .NDCLP  Clear loopback port\(^1\)
Argument Block
0  .NDPRT  NSP port number.

6 .NDLPF  Find loopback port\(^1\)
Argument Block
0  .NDPRT  NSP port number
1B0 (ND%LPR) Loopback running.
1B1 (ND%LPA) Loopback port assigned.

NODE ERROR MNEMONICS:
ARGX02:  Invalid function
ARGX19:  Invalid unit number
CAPX2:  WHEEL, OPERATOR, or MAINTENANCE capability required
NODX02:  Line not turned off
NODX03:  Another line already looped

\(^1\) DECSYSTEM-2020 only.

Version 3A  3-158.1  September 1978
NOUT     JSYS 224

Outputs an integer number.

ACCEPTS IN AC1: destination designator

AC2: number to be output

AC3: B0(NO%MAG) output the magnitude. That is, output the
    number as an unsigned 36-bit number (e.g.,
    output -1 as 777777 777777).

B1(NO%SGN) output a plus sign for a positive number.

B2(NO%LFL) output leading filler. If this bit is not
    set, trailing filler is output, and bit
    3(NO%ZRO) is ignored.

B3(NO%ZRO) output 0's as the leading filler if the
    specified number of columns (NO%COL) allows filling. If this bit is not
    set, blanks are output as leading filler if the
    number of columns allows filling.
TOPS-20 MONITOR CALLS(PBOUT)

PBOUT JSYS 74

Outputs a byte sequentially to the primary output designator. This call is equivalent to a BOUT call with the destination designator given as .PRIOU.

ACCEPTS IN AC1: byte to be output, right-justified

RETURNS +1: always

Can cause several software interrupts or process terminations on certain file conditions. (Refer to bit OFHER of the OPENF call description.)

PBOUT ERROR MNEMONICS:

DESX1: invalid source/destination designator
DESX2: terminal is not available to this job
DESX3: JFN is not assigned
DESX5: file is not open
IOX2: file is not open for writing
IOX5: device or data error
IOX6: illegal to write beyond absolute end of file
IOX11: quota exceeded or disk full

PEEK JSYS 311

Transfers a block of words from the monitor to the user space. The desired monitor pages must have read access. This monitor call is used to obtain data from the monitor for maintenance and test purposes and should be executed only when GETAB information is not available.

ACCEPTS IN AC1: word count in the left half, and first virtual address of the monitor in the right half

AC2: first user address

RETURNS +1: failure, error code in AC1
+2: success, the desired words are transferred.

The PEEK monitor call requires the process to have the MAINTENANCE, WHEEL, or OPERATOR capability enabled.

PEEK ERROR MNEMONICS:

CAPX1: WHEEL or OPERATOR capability required
PEEKX2: read access failure on monitor page
**TOPS-20 MONITOR CALLS (PLOCK)**

**PLOCK**  **JSYS 561**

Acquires physical memory and places a designated section of the process' address space in memory. Allows the process to specify the memory pages to be used, or permits the system to select the pages. The *PLOCK* monitor call requires the process to have WHEEL, OPERATOR, or MAINTENANCE capability enabled.

**Accepts**

IN AC1: address of first page if acquiring (locking) or -1 if unlocking.

AC2: process handle (currently .FHSLF only) in the left half and number of first page in the right half.

AC3: control flags in the left half and repeat count in the right half. The control flags are

B0 (LK%CNT) right half of AC3 contains a count of the number of pages to lock.

B1 (LK%PHY) value in AC1 is the first page desired. If this bit is off and AC1 is not -1, the system selects pages.

B2 (LK%NCH) pages will not be cached.

B3 (LK%AOL) off-line pages are to be locked.

**Returns**

+1: always

If the *PLOCK* call is unable to honor any one of the requests to unlock any one of the pages specified by the repeat count, it will unlock all of the others.

A page that was locked with the *PLOCK* call may be unmapped. (Refer to the PMAP call.) This will unlock the process' page and return the now unlocked physical page to its previous state.

The page selected by the user must be capable of being placed off-line for the *PLOCK* call to acquire it.

Generates an illegal instruction interrupt on error conditions below.

**PLOCK ERROR MNEMONICS:**

ARGX22: invalid flag

ARGX24: invalid count

Version 3A 3-168 September 1978
Maps one or more complete pages from a file to a process (for input), from a process to a file (for output), or from one process to another process. Each of the three uses of PMAP is described below.

Case I Mapping File Pages to a Process

This use of the PMAP call does not actually transfer any data; it simply changes the contents of the process' page map. When changes are made to the page in the process, the changes will also be reflected in the page in the file, if write access has been specified for the file.

ACCEPTS IN AC1: JFN of the file in the left half, and the page number in the file in the right half. This AC contains the source.

AC2: process handle in the left half, and the page number in the process in the right half. This AC contains the destination.

AC3: B0(PM%CNT) A count is in the right half of AC3. This count specifies the number of sequential pages to be mapped.

B2(PM%RD) Permit read access to the page.

B3(PM%WR) Permit write access to the page.

B4(PM%EX) Reserved for future use.

The symbol PM%RWX can be used to set B2-B4.

B5(PM%PLD) Preload the page being mapped (i.e., move the page immediately instead of waiting until it is referenced).

B9(PM%CPY) Create a private copy of the page when it is written into (copy-on-write). If the page is mapped between two processes (Case III below), both processes will receive a private copy of the page.

B18-B35 (PM%RPT) Number of pages to be mapped if B0(PM%CNT) is set.

RETURNS +1: always

This use of PMAP changes the map of the process such that addresses in the page in the process specified by the right half of AC2 actually refer to the page in the file specified by the right half of AC1. The present contents of the page in the process are removed. If the page in the file is currently nonexistent, it will be created when it is written (i.e., when the corresponding page in the process is written).

This use of PMAP is legal only if the file is opened for at least read access. The access bits specified in the PMAP call are ANDed with the access that was specified when the file was opened. However, copy-on-write is always granted, regardless of the file's access. The access granted is placed in the process' map.
The file cannot be closed while any of its pages are mapped into any process. Thus, before the file is closed, pages must be unmapped from each process by a PMAP call with -1 in AC1 (see below).

Case II Mapping Process Pages to a File

This use of the PMAP call actually transfers data by moving the contents of the specified page in the process to the specified page in the file. The process' map for that page becomes empty.

ACCEPTS IN AC1: process handle in the left half, and the page number in the process in the right half. This AC contains the source.

AC2: JFN of the file in the left half, and the page number in the file in the right half. This AC contains the destination.

AC3: access bits and repetition count. (Refer to Case I.)

RETURNS +1: always

The process page and the file page must be private pages. The ownership of the process page is transferred to the file page. The present contents of the page in the file is deleted.

The access granted to the file page is determined by ANDing the access specified in the PMAP call with the access specified when the file was opened.

When mapping pages from a process to a file, the end-of-file byte pointer and the byte size are not automatically updated in the File Descriptor Block (FDB). To allow the file to be read later via the sequential I/O calls (e.g., BIN, SIN), the process executing the PMAP call should close the file keeping the JFN (CLOSF call, bit CO%NRJ), update the byte pointer and the byte size in the FDB (CHFDB call), and then release the JFN (RLJFN call). (Refer to Section 2.2.8 for the format of the FDB fields.)

Case III Mapping One Process' Pages to Another Process

This use of the PMAP call normally does not transfer any data; it simply changes the contents of the page maps of the processes. When changes are made to the page in one process, the changes will also be reflected in the corresponding page in the other process.

ACCEPTS IN AC1: process handle in the left half, and the page number in the process in the right half. This AC contains the source.

AC2: a second process handle in the left half, and page number in that process in the right half. This AC contains the destination.

AC3: access bits and repetition count. (Refer to Case I.)

RETURNS +1: always
This use of PMAP changes the map of the destination process such that addresses in the page specified by the right half of AC2 actually refer to the page in the source process specified by the right half of AC1. The present contents of the destination page are deleted.

The access granted to the destination page is determined by the access specified in the PMAP call.

Unmapping Pages In a Process

As stated previously, a file cannot be closed if any of its pages are mapped in any process. To unmapp the file's pages from a process, a PMAP call is executed with

AC1: -1

AC2: process handle in the left half, and page number in the process in the right half

AC3: B0(PM%CNT) Repeat count. Only the process page numbers are incremented.

B18-B35 Number of pages to remove from process

This format of the PMAP call removes the pages indicated in AC2 from the process.

A page that was locked with the PLOCK call may be unmapped. Doing so will unlock the process' page and return the now unlocked physical page to its previous state.

Illegal PMAP calls

The PMAP call is illegal if:

1. Both AC1 and AC2 designate files.
2. Both AC1 and AC2 are 0.
3. The PMAP call designates a file with write-only access.
4. The PMAP call designates a file with append-only access.

Can cause several software interrupts on certain file conditions. Generates an illegal instruction interrupt on error conditions below.

PMAP ERROR MNEMONICS:

DESX1: invalid source/destination designator
DESX3: JFN is not assigned
DESX5: file is not open
DESX7: JFN cannot refer to output wildcard designators
PMAPX1: invalid access requested
PMAPX2: invalid use of PMAP
PMAPX3: illegal to move shared page into file
PMAPX4: illegal to move file page into process
PMAPX5: illegal to move special page into file
PMAPX6: disk quota exceeded
PMAPX7: illegal to map file on dismounted structure
FRKHXL: invalid process handle
FRKHX2: illegal to manipulate a superior process
FRKHX3: invalid use of multiple process handle
FRKHX7: process page cannot exceed 777
LNGFX1: page table does not exist and file not open for write
IOX11: quota exceeded or disk full
ARGX06: invalid page number

**PMCTL JSYS 560**

Controls physical memory. This call allows a privileged program to add or remove most pages of physical memory and to control use of cache memory.

The PMCTL monitor call requires the process to have WHEEL, OPERATOR, or MAINTENANCE capability enabled.

**ACCEP**TS IN AC1: function code

AC2: length of the argument block
AC3: address of the argument block

**RETURNS** +1: always

The defined functions and their argument blocks are as follows:

<table>
<thead>
<tr>
<th>Function</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.MCRCE</td>
<td>Return the status of cache memory. The status is returned in word .MCCST of the argument block.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Argument Block</strong></td>
</tr>
<tr>
<td>0</td>
<td>.MCCST</td>
<td>If B35(MC%CEN) is on, the cache is enabled.</td>
</tr>
<tr>
<td>1</td>
<td>.MCSCE</td>
<td>Set the status of cache memory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Argument Block</strong></td>
</tr>
<tr>
<td>0</td>
<td>.MCCST</td>
<td>Enable the cache if B35(MC%CEN) is on.</td>
</tr>
</tbody>
</table>

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TOPS-20 MONITOR CALLS (PMCTL)

2 .MCRPS

Return the status of the given page(s). The number of the page is given in word .MCPPN, and its status is returned in word .MCPST.

Argument Block

0 .MCPPN  Negative count in left half; number of physical page in right half
1 .MCPST  Returned page status. The status is represented by one of the following values:
0 .MCPSA  Page is available for normal use.
1 .MCPSO  Page is off line because it is nonexistent. Nonexistent memory is marked as off line at system startup.
2 .MCPE  Page is off line because the monitor detected an error.
3 .MCPS  Page is in a transition state.

3 .MCSPS

Set the status of the given page. The number of the page is given in word .MCPPN, and the status value is given in word .MCPST.

Argument Block

0 .MCPPN  Number of physical page.
1 .MCPST  Status for page. The status is represented by one of the following values:
0 .MCPSA  Mark page available for normal use.
1 .MCPSO  Mark page off line because it does not exist.
2 .MCPE  Mark page off line because it has an error.
3 .MCPS  Collect information about MOS memory errors. Store the information in block addressed by AC3 and update AC2 on return.
A list of those pages that PMCTL cannot acquire follows:

- the EPT
- the monitor's UPT
- any page containing a CST0 entry
- any page containing an SPT entry
- the page containing MMAP
- any page belonging to the resident free space pool

In certain specialized monitors, for example TOPS-20AN, there are additional pages that cannot be acquired. An estimate of the size of these areas follows:

- CST0  one word for every page of memory supported (two to four pages)
- SPT   four pages
- MMAP  one page
- Resident Free Space Pool  two pages minimum

Generates an illegal instruction interrupt on error conditions below.

PMCTL ERROR MNEMONICS:

- CAPX2:    WHEEL, OPERATOR, or MAINTENANCE capability required
- PMCLX1:   invalid page state or state transition
- PMCLX2:   requested physical page is unavailable
PSOUT ERROR MNEMONICS:

DESX1: invalid source/destination designator
DESX2: terminal is not available to this job
DESX3: JFN is not assigned
DESX5: file is not open
IOX2: file is not open for writing
IOX5: device or data error
IOX6: illegal to write beyond absolute end of file
IOX11: quota exceeded or disk full

RCDIR  JSYS 553

Translates the given directory string to its corresponding 36-bit directory number. The directory string consists of the structure name or logical name and a colon followed by the directory name enclosed in either square brackets or angle brackets. No spaces can appear between the structure name and the directory name, and each field given must include its punctuation. An example of a directory string is PS:<SMITH>. If the structure name is omitted from the string, the user's connected structure is used. If the directory name is omitted from the string, the user's connected directory is used.

Recognition can be used on the string but only on the directory name field; recognition cannot be used on the structure name field. Partial recognition can be allowed so that a user can employ recognition when typing the name of a subdirectory. When recognition is used on the directory name field and the directory name is not ambiguous, the closing bracket is not required.

The directory name field can contain wildcard characters, and repeated RCDIR calls can be executed to obtain the numbers of the directories whose characters match the given directory. After the first call, each subsequent RCDIR call returns the number of the next directory in the group.

ACCEPTS IN AC1: flag bits in the left half

AC2: pointer to ASCIZ string to be translated, a JFN, a 36-bit user number, or a 36-bit directory number (given for the purpose of checking its validity)

AC3: 36-bit directory number (given when stepping to the next directory in a group of directories)
RETURNS +1: always, with

AC1 containing flag bits in the left half

AC2 containing an updated string pointer (if a pointer was supplied as the argument). If recognition was used, this pointer reflects the remainder of the string that was appended to the original string.

AC3 containing a 36-bit directory number if execution of the call was successful

The flag bits supplied in the left half of AC1 are as follows:

B14(RC%PAR) Allow partial recognition on the directory name. If the name given matches more than one directory, bit RC%AMB is set on return and the string is updated to reflect the unique portion of the directory name. If bit RC%PAR is not set, the name given matches more than one directory, and recognition is being used, bit RC%AMB is set on return, but the string is not updated.

B15(RC%STP) Step to the next directory in the group and return the number of that directory. AC1 must have bit RC%AWL set. AC2 must contain a pointer to a string that contains wildcard characters in the directory name field. AC3 must contain a directory number.

B16(RC%AWL) Allow the directory name to contain wildcard characters. No recognition is performed on a directory name that contains wildcard characters. Also, the directory name must include its terminating bracket. This bit must be set if bit RC%STP is also set.

B17(RC%EMO) Match the given string exactly. When both the RC%PAR and RC%EMO bits are on, recognition is not used on the string, and the string is matched exactly. If this bit is off, recognition is used on the string.

The flag bits returned in the left half of AC1 are as follows:

On success

B0(RC%DIR) Directory can be used only by connecting to it (i.e., it is a files-only directory). If this bit is off, the user can also login to (if the directory is on the public structure) or access this directory.

B1(RC%ANA) Obsolete

B2(RC%RLM) All messages from <SYSTEM>MAIL.TXT are repeated every time the user logs in. If this bit is off, messages are printed only once.

B6(RC%WLD) The directory name given contained wildcard characters.
TOPS-20 MONITOR CALLS (RCUSR)

RCUSR   JSYS 554

Translates the given user name string to its corresponding 36-bit user number. The user name string consists of the user's name without any punctuation. The string must be associated with a directory on structure PS: that is not a files-only directory.

Recognition can be used on the string. In addition, the string can contain wildcard characters.

ACCEPTS IN AC1: flag bits in the left half
   AC2: pointer to ASCII string to be translated
   AC3: 36-bit user number (given when stepping to the next user name in a group)

RETURNS +1: always, with
   AC1 containing flag bits in the left half
   AC2 containing an updated string pointer. If recognition was used, this pointer reflects the remainder of the string that is appended to the original string.
   AC3 containing a 36-bit user number if execution of the call was successful

The flag bits supplied in the left half of AC1 are as follows. For additional information on these bits, refer to the RCDIR monitor call description.

B14(RC%PAR) Allow partial recognition on the user name string.
B15(RC%STP) Step to the next user name in the group.
B16(RC%AWL) Allow the user name to contain wildcard characters.
B17(RC%EMO) Match the given string exactly.

The flag bits returned in the left half of AC1 are as follows. For additional information on these bits, refer to the RCDIR monitor call description.

On success

B1(RC%ANA) Obsolete
B2(RC%RLM) User sees all messages from <SYSTEM>MAIL.TXT every time he logs in. If this bit is off, the user sees the messages only once.
B6(RC%WLD) The user name given contained wildcard characters.
On failure

B3(RC%NOM) No match was found for the string given. This bit will be on if the string given refers to a files-only directory, if there is no directory on PS: that is associated with the user name string, or bit RC%EMO was on in the call and a string was given that matched more than one user.

B4(RC%AMB) The string given was ambiguous because it matched more than one user.

B5(RC%NMD) There are no more user names in the group.

The RCDIR monitor call can be used to translate a directory string to its corresponding directory number. The DIRST monitor call can be used to translate either a user number or a directory number to its corresponding string.

Generates an illegal instruction interrupt on error conditions below.

RCUSR ERROR MNEMONICS:

RCUSX1: insufficient system resources
RCDIX4: monitor internal error
STRX07: invalid user number
STRX08: invalid user name

**RDTTY JSYS 523**

Reads input from the primary input designator (.PRIIN) into the caller's address space. Input is read until either a break character is encountered or the given byte count is exhausted, whichever occurs first. Output generated as a result of character editing is output to the primary output designator (.PRIOU).

The RDTTY call handles the following editing functions:

1. Delete the last character input (DELETE).
2. Delete back to the last punctuation character (CTRL/W).
3. Delete back to the beginning of the current line or, if the current line is empty, back to the beginning of the previous line (CTRL/U).
4. Retype the current line from its beginning or, if the current line is empty, retype the previous line (CTRL/R).
5. Accept the next character without regard to its usual meaning (CTRL/V).

By handling these functions, the RDTTY call serves as an interface between the terminal and the user program.
TOPS-20 MONITOR CALLS (SETJB)

.SJDM(2) Set default for magnetic tape data mode.
.SJDDM(0) System default data mode
.SJDMC(1) Dump mode
.SJDM6(2) SIXBIT byte mode (7-track drives)
.SJDMA(3) ANSI ASCII mode (7 bits in 8-bit bytes)
.SJDM8(4) Industry compatible mode

.SJRS(3) Set default for magnetic tape record size in words.

.SJDFS(4) Set spooling mode.
.SJSPI(0) Immediate mode spooling
.SJSPD(1) Deferred mode spooling

.SJSRM(5) Set remark for current job session. AC3 contains a pointer to the session remark, which is updated on a successful return. The first 39 characters of the session remark are placed in the job's Job Storage Block.

The SETJB monitor call requires the process to have WHEEL or OPERATOR capability enabled to set parameters for a job other than the current job.

The GETJI monitor call can be used to obtain the job parameters for a specified job.

Generates an illegal instruction interrupt on error conditions below.

SETJB ERROR MNEMONICS:
SJBX1: invalid function
SJBX2: invalid magnetic tape density
SJBX3: invalid magnetic tape data mode
SJBX4: invalid job number
SJBX5: job is not logged in
SJBX6: WHEEL or OPERATOR capability required
SJBX7: remark exceeds 39 characters
SJBX8: illegal to perform this function
**TOPS-20 MONITOR CALLS (SETNM)**

**SETNM  JSYS 210**

Sets the private name of the program being used by the current job. This name is the one printed on SYSTAT listings.

**ACCEPTS** IN AC1: SIXBIT name used to identify program

**RETURNS** +1: always

The GETNM monitor call can be used to obtain the name of the program currently being used.

**SETSN  JSYS 506**

Sets either the system name or the private name of the program being used by the current job.

**ACCEPTS** IN AC1: SIXBIT name to be used as the system name. This name is the one used for system statistics.

AC2: SIXBIT name to be used as the private name. This name is the same as the one set with the SETNM call.

**RETURNS** +1: failure. (Currently, there are no failure returns defined.)
+2: success

System program usage statistics are accumulated in the system tables SNames, STIMES, and SPFLTS. (Refer to Section 2.3.2.) To make this possible, the SETSN call must be executed by each job whenever the system program name is changed. In the usual case, the TOPS-20 Command Language handles this. The argument to SETSN should be: for system programs (programs from directory <SUBSYS>), the filename, truncated to six characters and converted to SIXBIT; for private programs, "(PRIV)."

**SEVEC  JSYS 204**

Sets the entry vector of the specified process. (Refer to Section 2.7.3.)

**ACCEPTS** IN AC1: process handle

AC2: entry vector word (length in the left half and address of first word in the right half), or 0

**RETURNS** +1: always

The GEVEC monitor call can be used to obtain the process' entry vector.
TOPS-20 MONITOR CALLS (SFMOD)

SFMOD JSYS 110

Sets the program-related modes for the specified terminal. The modes that can be set by this call are in the following bits of the JFN mode word. (Refer to Section 2.4.3.1.)

- B0 (TT%OSP) output suppression control
- B18-B23 (TT%WAK) wakeup control
- B24 (TT%ECO) echoes on
- B28-B29 (TT%DAM) data mode

ACCEPTS IN AC1: file designator

AC2: JFN mode word

RETURNS +1: always

The SFMOD call is a no-op if the designator is not associated with a terminal.

The STPAR monitor call can be used to set device-related modes of the JFN mode word, and the RFMOD monitor call can be used to obtain the JFN mode word.

SFMOD ERROR MNEMONICS:

- DESX1: invalid source/destination designator
- DESX3: JFN is not assigned
- DESX5: file is not open
- DEVX2: device already assigned to another job
- TTYX01: line is not active

SFORK JSYS 157

Starts the specified process. If the process is frozen, the SFORK call changes the PC but does not resume the process. The RFORK call must be used to resume the process.

ACCEPTS IN AC1: process handle

AC2: the PC of the process being started.

RETURNS +1: always

The SFRKV monitor call can be used to start a process at a given position in its entry vector.
TOPS-20 MONITOR CALLS (SFORK)

Generates an illegal instruction interrupt on error conditions below.

SFORK ERROR MNEMONICS:
FRKHX1: invalid process handle
FRKHX2: illegal to manipulate a superior process
FRKHX3: invalid use of multiple process handle

SFPOS    JSYS 526

Sets the position of the specified terminal's pointer. (Refer to Section 2.4.3.4 for information on page lengths and widths of terminals.)

ACCEPTS IN AC1: file designator

AC2: position within a page (i.e., line number) in the left half, and position with a line (i.e., column number) in the right half

RETURNS +1: always

The SFPOS monitor call is a no-op if the designator is not associated with a terminal or is in any way illegal.

The RFPOS monitor call can be used to obtain the current position of the terminal's pointer.

SFPOS ERROR MNEMONICS:
TTYX01: line is not active

SFPRTR    JSYS 27

Sets the position of the specified file's pointer for subsequent I/O to the file. The SFPRTR call specifying a certain byte number, followed by a BIN call, has the same effect as a RIN call specifying the same byte number.

ACCEPTS IN AC1: JFN

AC2: byte number to which the pointer is to be set, or -1 to set the pointer to the current end of the file

RETURNS +1: failure, error code in AC1
+2: success

The RFPRTR monitor call can be used to obtain the current position of the file's pointer.
<table>
<thead>
<tr>
<th>Function Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 .SFBTE</td>
<td>Bit table errors found on startup.</td>
</tr>
<tr>
<td>12 .SFCRD</td>
<td>Users can change nonprivileged directory parameters with the CRDIR monitor call.</td>
</tr>
<tr>
<td>13 .SPNVT</td>
<td>ARPANET terminal LOGINS are allowed.</td>
</tr>
<tr>
<td>21 .SPUSG</td>
<td>USAGE file entries are allowed.</td>
</tr>
<tr>
<td>22 .SFFLO</td>
<td>Disk latency optimization using the RH20 backup register is enabled. This feature is not to be enabled unless the M8555 board of the RH20 is at Revision Level D AND either of the KL10-C processor is at Revision Level 10 or KL10-E processor is at Revision Level 2.</td>
</tr>
<tr>
<td>44 .SFNTN</td>
<td>Turn ARPANET on.</td>
</tr>
<tr>
<td>45 .SFNDU</td>
<td>Reinitialize ARPANET if it is down.</td>
</tr>
<tr>
<td>46 .SPNHI</td>
<td>Initialize ARPANET host table.</td>
</tr>
<tr>
<td>47 .SPTM2</td>
<td>Set the local time zone to the value given in AC2.</td>
</tr>
<tr>
<td>50 .SFLHN</td>
<td>Set the local ARPANET host number to the value given in AC2.</td>
</tr>
<tr>
<td>51 .SFAVR</td>
<td>Account validation will be running on this system.</td>
</tr>
<tr>
<td>52 .SFSTS</td>
<td>Enable/disable status reporting.</td>
</tr>
</tbody>
</table>

Function codes 0 through 22 represent a specific monitor flag bit. When the value of the function is 1 (i.e., AC2 contains the value 1), the bit corresponding to the function is set. When the value is 0, the bit is cleared.

The TMON monitor call can be used to obtain the settings of the various monitor flags.

Generates an illegal instruction interrupt on error conditions below.

SMON ERROR MNEMONICS:

SMONX1: WHEEL or OPERATOR capability required

SMONX2: invalid SMON function

---

**SNOOP JSYS 516**

Performs system performance analysis. The SNOOP call requires the process to have WHEEL or OPERATOR capability enabled, because the process can patch any instruction in the monitor with this call. For example, the user program can build a PC histogram by patching an instruction in the code for the 1.0-millisecond clock.
The general procedure for using the SNOOP call is as follows:

1. The user program supplies a set of breakpoint routines that are called by the monitor when control reaches one of the patched instructions. These routines are mapped into the monitor's address space into an area selected by the monitor. Thus, the routines must have self-relocating code or must be relocated by the user program to where they will be run, based on the monitor address supplied by the monitor.

2. The user program defines a number of breakpoints, analogous to DDT breakpoints.

3. The user program inserts all of the breakpoints simultaneously.

4. The user program goes to "sleep" or waits for terminal input while its breakpoint routines obtain control.

5. When the user program determines that the routines have completed, it removes the breakpoints.

The user program breakpoint routines run in the monitor address space, which means that the addresses of the code and the data are monitor addresses. The user program must modify these addresses, based on the values returned by the monitor, after the initialization but before the "snooping." The breakpoint routines must preserve any accumulators they use. Also, they must not cause a page fault if at interrupt level or if a patch has been made in the page fault handler or in the scheduler. Thus, the breakpoint routines should test for swappable code being in memory before referencing it. If swappable code needs to be referenced, the swappable monitor can be locked in memory, if desired. When a patch is made to a routine called at many interrupt levels, the program must specify a reentrant instruction to be used for patching.

**ACCEPTS IN AC1:** function code

AC2: arguments for
AC3: the specified
AC4: function

**RETURNS**
+1: failure, error code in AC1
+2: success

The following functions are available:

<table>
<thead>
<tr>
<th>Function Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 .SNPLC</td>
<td>Declare and lock code into the monitor's address space.</td>
<td></td>
</tr>
</tbody>
</table>

AC2: number of pages desired
AC3: page number in user space of start of breakpoint routines to be locked
TOPS-20 MONITOR CALLS (SNOOP)

On return, the pages are locked contiguously in the monitor's address space, and AC2 contains the monitor page numbers corresponding to the given user page number.

1 .SNPLS

Lock the swappable monitor. This function is useful for analyzing swappable data at interrupt level. On return, the entire swappable monitor is locked.

2 .SNPDB

Define a breakpoint

AC2: number of breakpoint

AC3: address in monitor space to be patched. The patched instruction can be a skip type instruction or a PUSHJ instruction, and the patching is similar to that in DDT. The routines will receive control before the patched instruction is executed.

AC4: instruction to be executed before the patched instruction is executed. The instruction can be:

JSR LOC where LOC is an address in monitor space of the user's routine.

PUSHJ P,LOC when reentrant or recursive code is patched.

AOS LOC to count frequency of monitor execution points.

The error return is given if breakpoints have already been inserted.

3 .SNPIB

Insert all breakpoints and start analyzing.

4 .SNPRB

Remove all breakpoints and stop analyzing.

5 .SNPUL

Unlock and release all storage, and undefine and remove all breakpoints.

6 .SNPSY

Obtain the address of a monitor symbol.

AC2: radix-50 symbol

AC3: radix-50 program name if a local address is desired. If AC3 is 0, the entire symbol table is searched.

On return, AC2 contains the monitor address or value of the symbol.
TOPS-20 MONITOR CALLS (SNOOP)

7 .SNPAD Obtain a monitor symbol.

AC2: 36-bit value of symbol that is to be looked up in the monitor's symbol table.

AC3: radix-50 program name if a local value is desired. If AC3 is 0, the entire symbol table is searched.

On return, AC2 contains the first radix-50 monitor symbol that is closest to and has a value less than the specified value, and AC3 contains the difference between the value of the symbol returned and the specified value.

SNOOP ERROR MNEMONICS:

SNOPX1: WHEEL or OPERATOR capability required
SNOPX2: invalid function
SNOPX3: .SNPLC function must be first
SNOPX4: only one .SNPLC function allowed
SNOPX5: invalid page number
SNOPX6: invalid number of pages to lock
SNOPX7: illegal to define breakpoints after inserting them
SNOPX8: breakpoint is not set on instruction
SNOPX9: no more breakpoints allowed
SNOP10: breakpoints already inserted
SNOP11: breakpoints not inserted
SNOP12: invalid format for program name symbol
SNOP13: no such program name symbol
SNOP14: no such symbol
SNOP15: not enough free pages for snooping
SNOP16: multiply-defined symbol
SNOP17: breakpoint already defined
SNOP18: data page is not private or copy-or-write
TOPS-20 MONITOR CALLS (TLINK)

B4(TL%SAB) Examine B5(TL%ABS) to determine the setting of the object designator's accept link bit. If this bit is off, B5 is ignored.

B5(TL%ABS) Set the object designator's accept link bit. When B4(TL%SAB) is on, the object designator is accepting links if TL%ABS is on and refusing links if TL%ABS is off.

B6(TL%STA) Examine B7(TL%AAD) to determine the setting of the object designator's accept advice bit. If this bit is off, B7 is ignored.

B7(TL%AAD) Set the object designator's accept advice bit. When B6(TL%STA) is on, the object designator is accepting advice if TL%AAD is on and refusing advice if TL%AAD is off.

B18-B35 Object designator (TL%OBJ)

AC2: remote designator

RETURNS +1: failure, error code in AC1
+2: success

The object and remote designators must be either 4xxxxx or -1. An object designator of -1 indicates the controlling terminal.

The following restrictions apply if the process does not have WHEEL capability enabled:

1. The object designator must specify a terminal assigned to this job.
2. The object-to-remote link must be specified before or at the same time as the remote-to-object link.

If the accept bit of the remote designator is not set, a link from the object-to-remote designator causes the remote designator's bell to ring. If the remote designator does not set the accept bit within 15 seconds, the TLINK call returns an error.

When terminals are linked together and a character is typed on one terminal, the same ASCII character code is sent to all terminals in the link. The character always appears in the output buffers of all terminals regardless of the current mode of each individual terminal. The character is sent according to the data mode and terminal type of the terminal that originates the character. For example, if one terminal originates a TAB and has mechanical tabs set, all terminals in the link receive the ASCII code for a TAB in their output buffers.

TLINK ERROR MNEMONICS:

DESX1: invalid source/destination designator
TLNXX1: illegal to set remote to object before object to remote
TOPS-20 MONITOR CALLS (SNOOP)

TLNXX2: link was not received within 15 seconds
TLNXX3: links full
TTYX01: line is not active

**TMON JSYS 7**

Tests various monitor flags.

**ACCEPTE IN AC1:** function code

**RETURNS** +1: always, value of the function in AC2

The codes for the functions are as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.SFPAC</td>
<td>FACT files entries are allowed.</td>
</tr>
<tr>
<td>1</td>
<td>.SPCDE</td>
<td>CHECKD found errors.</td>
</tr>
<tr>
<td>2</td>
<td>.SFCDR</td>
<td>CHECKD is running.</td>
</tr>
<tr>
<td>3</td>
<td>.SFMDT</td>
<td>Manual start is in progress.</td>
</tr>
<tr>
<td>4</td>
<td>.SFRMT</td>
<td>Remote LOGINS (dataset lines) are allowed.</td>
</tr>
<tr>
<td>5</td>
<td>.SFPTY</td>
<td>PTY LOGINS are allowed.</td>
</tr>
<tr>
<td>6</td>
<td>.SFCTY</td>
<td>CTY LOGINS are allowed.</td>
</tr>
<tr>
<td>7</td>
<td>.SFOPR</td>
<td>Operator is in attendance.</td>
</tr>
<tr>
<td>10</td>
<td>.SFLCL</td>
<td>Local LOGINS (hardwired lines) are allowed.</td>
</tr>
<tr>
<td>11</td>
<td>.SFBTE</td>
<td>Bit table errors found on startup.</td>
</tr>
<tr>
<td>12</td>
<td>.SFCDR</td>
<td>Users can change nonprivileged directory parameters with the CRDIR monitor call.</td>
</tr>
<tr>
<td>13</td>
<td>.SFNVT</td>
<td>ARPANET terminal LOGINS are allowed.</td>
</tr>
<tr>
<td>21</td>
<td>.SFUSG</td>
<td>USAGE file entries are allowed.</td>
</tr>
<tr>
<td>22</td>
<td>.SFFLO</td>
<td>Disk latency optimization using the RH20 backup register is enabled.</td>
</tr>
<tr>
<td>44</td>
<td>.SFNMT</td>
<td>ARPANET is on.</td>
</tr>
<tr>
<td>45</td>
<td>.SFNDU</td>
<td>ARPANET will be reinitialized if it is down.</td>
</tr>
<tr>
<td>46</td>
<td>.SFNHI</td>
<td>ARPANET host table will be initialized.</td>
</tr>
<tr>
<td>47</td>
<td>.SFMTZ</td>
<td>Local time zone is set.</td>
</tr>
<tr>
<td>50</td>
<td>.SFNLN</td>
<td>Local ARPANET host number is set.</td>
</tr>
<tr>
<td>51</td>
<td>.SFAPR</td>
<td>Account validation is running on this system.</td>
</tr>
<tr>
<td>52</td>
<td>.SFSTS</td>
<td>Status reporting is enabled</td>
</tr>
</tbody>
</table>

Functions 0 through 22 represent a specific monitor flag bit. When the value of the function returned in AC2 is 1, the flag corresponding to the function is set. When the value returned is 0, the flag is not set.

The SMON monitor call can be used to set various monitor flags.

Generates an illegal instruction interrupt on error conditions below.

**TMON ERROR MNEMONICS:**

**TMONXL:** invalid TMON function

---

Version 3A 3-258 September 1978
This appendix contains the complete copy of the system file MONSYM.MAC, which defines the symbols used in the manual. The user must include the statement

SEARCH MONSYM

in his program to have the symbols defined in his assembly.
MONSYM.MAC

; This software is furnished under a license and may only be used
; or copied in accordance with the terms of such license.
;

; Monitor call definitions and error mnemonics

; NOTE:
; The following symbols are reserved:

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>RESERVED BY</th>
</tr>
</thead>
<tbody>
<tr>
<td>.OF???</td>
<td>RMS-20</td>
</tr>
<tr>
<td>.SZ???</td>
<td>RMS-20</td>
</tr>
<tr>
<td>.PS???</td>
<td>RMS-20</td>
</tr>
</tbody>
</table>

; Macro to define JSYS names

DEFINE DEFJS (NAME,NUM,SECT,XTRA)<
   OPDEF NAME [104B8+NUM]
   IFDEF .PSECT,<
   INTERN NAME>

   SALL

IFNDEF REL,<REL==0> ; Assembling REL if non-0
   IFE REL,<
      UNIVERSAL MONSYM>
   IFN REL,<
      TITLE MONSYM
      IFNDEF .PSECT,<
         .DIRECT .XTABM>
   >
;JSYS DEFINITIONS WITH 'NIM' AS A FOURTH ARGUMENT ARE CLASSIFIED
; AS 'NOT IN MONITOR'

DEFINE JSLIST <

DEFJS JSYS, 0,, NIM

DEFJS LOGIN, 1, MSECl
DEFJS CRJOB, 2, MSECl
DEFJS LGOUT, 3, MSECl
DEFJS CACCT, 4, MSECl
DEFJS EFACT, 5, MSECl
DEFJS SMON, 6, MSECl
DEFJS TMON, 7, MSECl
DEFJS GETAB, 10, MSECl
DEFJS ERSTR, 11, MSECl
DEFJS GETER, 12, MSECl
DEFJS GJINF, 13, MSECl
DEFJS TIME, 14, MSECl
DEFJS RUNTM, 15, MSECl
DEFJS SYSGT, 16, MSECl
DEFJS GNJFN, 17, MSECl
DEFJS GTJFN, 20, MSECl
DEFJS OPENF, 21, MSECl
DEFJS CLOSEF, 22, MSECl
DEFJS RLJFN, 23, MSECl
DEFJS GTSTS, 24, MSECl
DEFJS STSTS, 25, MSECl
DEFJS DELF, 26, MSECl
DEFJS SFPTR, 27, MSECl
DEFJS JFNS, 30, MSECl
DEFJS FFFFP, 31, MSECl
DEFJS RDDR, 32, MSECl ; OBSOLETE
DEFJS CPRTF, 33,, NIM
DEFJS C2FF, 34, MSECl
DEFJS RNAMF, 35, MSECl
DEFJS SIZEF, 36, MSECl
DEFJS GACTF, 37, MSECl
DEFJS STDIR, 40, MSECl ; OBSOLETE
DEFJS DIRST, 41, MSECl
DEFJS BKJFN, 42, MSECl
DEFJS RPPTR, 43, MSECl
DEFJS CNDR, 44,, NIM
DEFJS RFSZ, 45, MSECl
DEFJS SPFSZ, 46, MSECl
DEFJS SWJFN, 47, MSECl
DEFJS BIN, 50, MSECl
DEFJS BOUT, 51, MSECl
DEFJS SIN, 52, MSECl
DEFJS SOUT, 53, MSECl
DEFJS RIN, 54, MSECl
DEFJS ROUT, 55, MSECl
DEFJS PMAP, 56, MSECl
DEFJS RMAP, 57, MSECl
DEFJS SACTF, 58, MSECl
DEFJS GTFDB, 63, MSECl
DEFJS CHFDB, 64, MSECl
MONSYM.MAC

DEFJS DUMPI,65,MSEC1
DEFJS DUMPO,66,MSEC1
DEFJS DELDF,67,MSEC1
DEFJS ASND,70,MSEC1
DEFJS RELD,71,MSEC1
DEFJS CSYNQ,72,NIM
DEFJS PBIN,73,MSEC1
DEFJS PBOUT,74,MSEC1
DEFJS PSIN,75,NIM
DEFJS PSOUT,76,MSEC1
DEFJS MTOPR,77,MSEC1
DEFJS CFIBF,100,MSEC1
DEFJS CFOBF,101,MSEC1
DEFJS SIBE,102,MSEC1
DEFJS SOBE,103,MSEC1
DEFJS DOBE,104,MSEC1
DEFJS GTABS,105,MSEC1 ; OBSOLETE
DEFJS STABS,106,MSEC1 ; OBSOLETE
DEFJS RFMOD,107,MSEC1
DEFJS SMOD,110,MSEC1
DEFJS RFPOS,111,MSEC1
DEFJS RFAC,112,MSEC1
DEFJS SFAC,113,MSEC1
DEFJS STI,114,MSEC1
DEFJS DTAJ,115,MSEC1
DEFJS ATACH,116,MSEC1
DEFJS DVCHR,117,MSEC1
DEFJS STDEV,120,MSEC1
DEFJS DEVST,121,MSEC1
DEFJS MOUNT,122,MSEC1 ; OBSOLETE
DEFJS DSMNT,123 ; OBSOLETE
DEFJS SIR,125,MSEC1
DEFJS EIR,126,MSEC1
DEFJS SKPIR,127,MSEC1
DEFJS DIR,130,MSEC1
DEFJS AIC,131,MSEC1
DEFJS IIC,132,MSEC1
DEFJS DIC,133,MSEC1
DEFJS RC,134,MSEC1
DEFJS RWM,135,MSEC1
DEFJS DEBRK,136,MSEC1
DEFJS AT,137,MSEC1
DEFJS DTI,140,MSEC1
DEFJS CIS,141,MSEC1
DEFJS SIRCM,142,MSEC1
DEFJS RIRCM,143,MSEC1
DEFJS RIR,144,MSEC1
DEFJS GDSTS,145,MSEC1
DEFJS SDSTS,146,MSEC1
DEFJS RESET,147,MSEC1
DEFJS RPCAP,150,MSEC1
DEFJS EPACAP,151,MSEC1
DEFJS CFORK,152,MSEC1
DEFJS KFORK,153,MSEC1
DEFJS FFORK,154,MSEC1
DEFJS RFORT,155,MSEC1
DEFJS RFSTS,156,MSEC1
DEFJS SFORK,157,MSEC1
DEFJS SFACS,160,MSEC1
DEFJS RFACS,161,MSECl
DEFJS HFORK,162,MSECl
DEFJS WFORK,163,MSECl
DEFJS GFRKH,164,MSECl
DEFJS RFRKH,165,MSECl
DEFJS GFRKS,166,MSECl
DEFJS DISMS,167,MSECl
DEFJS HALTF,170,MSECl
DEFJS GTRPW,171,MSECl
DEFJS GTRPI,172,MSECl
DEFJS RTIW,173,MSECl
DEFJS STIW,174,MSECl
DEFJS SOBF,175,MSECl
DEFJS RWSET,176,MSECl
DEFJS GETNM,177,MSECl
DEFJS GET,200,MSECl
DEFJS SFRKV,201,MSECl
DEFJS SAVE,202,MSECl
DEFJS SSAVE,203,MSECl
DEFJS SEVEC,204,MSECl
DEFJS GEVEC,205,MSECl
DEFJS GPJFN,206,MSECl
DEFJS SPJFN,207,MSECl
DEFJS SETNM,210,MSECl
DEFJS PFUFF,211,MSECl
DEFJS DIBE,212,MSECl
DEFJS FDFRE,213,,NIM
DEFJS GDSKC,214,MSECl
DEFJS LITES,215,MSECl
DEFJS TLINK,216,MSECl
DEFJS STPAR,217,MSECl
DEFJS ODTIM,220,MSECl
DEFJS IDTIM,221,MSECl
DEFJS ODCNV,222,MSECl
DEFJS IDCNV,223,MSECl
DEFJS NOUT,224,MSECl
DEFJS NIN,225,MSECl
DEFJS STAD,226,MSECl
DEFJS GTAD,227,MSECl
DEFJS ODTNC,230,MSECl
DEFJS IDTNC,231,MSECl
DEFJS FLIN,232,MSECl
DEFJS FLOUT,233,MSECl
DEFJS DFIN,234,MSECl
DEFJS DFOUT,235,MSECl
DEFJS CRDIR,240,MSECl
DEFJS GTDIR,241,MSECl
DEFJS DSKOP,242,MSECl
DEFJS SPRIW,243,MSECl
DEFJS DSKAS,244,MSECl
DEFJS SJPRI,245,MSECl
DEFJS STO,246,MSECl
DEFJS ASNDP,260,,NIM
DEFJS RELDP,261,,NIM
DEFJS ASNDC,262,,NIM
DEFJS RELDC,263,,NIM
DEFJS STRDP,264,,NIM

; OBSOLETE
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DEFJS STPDP,265,NIM
DEFJS STDP,266,NIM
DEFJS RDSDP,267,NIM
DEFJS WATDP,270,NIM
DEFJS ATNVT,274,MSEC1 ;TOPS20AN
DEFJS CVSKT,275,MSEC1 ;TOPS20AN
DEFJS CVHST,276,MSEC1 ;TOPS20AN
DEFJS FLHST,277,MSEC1 ;TOPS20AN
DEFJS GCVEC,300,MSEC1
DEFJS SCVEC,301,MSEC1
DEFJS STTYP,302,MSEC1
DEFJS GTTYP,303,MSEC1
DEFJS BPT,304,MSEC1 ;OBSOLETE
DEFJS GTDAL,305,MSEC1
DEFJS WAIT,306,MSEC1
DEFJS HSYS,307,MSEC1
DEFJS USRIO,310,MSEC1
DEFJS PEEK,311,MSEC1
DEFJS MSFRK,312,MSEC1
DEFJS ESOUT,313,MSEC1
DEFJS SPLFR,314,MSEC1
DEFJS ADVIS,315,NIM
DEFJS JOBTM,316,NIM
DEFJS DELNF,317,MSEC1
DEFJS SWTCH,320,MSEC1 ;OBSOLETE
DEFJS TFORK,321,MSEC1
DEFJS RTFRK,322,MSEC1
DEFJS UTFRK,323,MSEC1
DEFJS SCTTY,324,MSEC1
DEFJS SETER,336,MSEC1
; NEW (NOT IN BBN TENEX) JSYS'S ADDED STARTING AT 500

DEFJS RSCAN,500,MSEC1
DEFJS HPTIM,501,MSEC1
DEFJS CRLNM,502,MSEC1
DEFJS LNMST,504,MSEC1
DEFJS RDTOX,505,MSEC1
DEFJS SETSN,506,MSEC1
DEFJS GETJI,507,MSEC1
DEFJS MSEND,510,MSEC1
DEFJS MRECV,511,MSEC1
DEFJS MUTIL,512,MSEC1
DEFJS ENQ,513,MSEC1
DEFJS DEQ,514,MSEC1
DEFJS ENQC,515,MSEC1
DEFJS SNOOP,516,MSEC1
DEFJS SPOOL,517,MSEC1
DEFJS ALLOC,520,MSEC1
DEFJS CHKAC,521,MSEC1
DEFJS TIMER,522,MSEC1
DEFJS RDTTY,523,MSEC1
DEFJS TEXTI,524,MSEC1
DEFJS UPFGS,525,MSEC1
DEFJS SFPO,526,MSEC1
DEFJS SYERR,527,MSEC1
DEFJS DIAG,530,MSEC1
DEFJS SINR,531,MSEC1
DEFJS SOUTR,532,MSEC1
DEFJS RFTAD,533,MSEC1
DEFJS SFTAD,534,MSEC1
DEFJS TBDEL,535,MSEC1
DEFJS TBADD,536,MSEC1
DEFJS TBLUK,537,MSEC1
DEFJS STCMP,540,MSEC1
DEFJS SETJB,541,MSEC1
DEFJS GDVEC,542,MSEC1
DEFJS SDVEC,543,MSEC1
DEFJS COMND,544,MSEC1
DEFJS PRARG,545,MSEC1
DEFJS GACCT,546,MSEC1
DEFJS LPINI,547,MSEC1
DEFJS GFUST,550,MSEC1
DEFJS SFUST,551,MSEC1
DEFJS ACCES,552,MSEC1
DEFJS RCDIR,553,MSEC1
DEFJS RCSR,554,MSEC1
DEFJS MSTP,555,MSEC1
DEFJS STPPN,556,MSEC1
DEFJS PENST,557,MSEC1
DEFJS PMCTL,560,MSEC1
DEFJS PLOCK,561,MSEC1
DEFJS BOOT,562,MSEC1
DEFJS UTEST,563
DEFJS USAGE,564,MSEC1

; HOLE - SLOT 565 AVAILABLE

DEFJS VACCT,566,MSEC1
DEFJS NODE,567,MSEC1
DEFJS ADBRK,570,MSEC1
DEFJS SINM,571,NIM
DEFJS SOUTH,572,NIM
DEFJS SWTRP,573,,NIM

;TEMPORARY JSYS DEFINITIONS

DEFJS SNDIM,750,MSEC1 ;TOPS20AN
DEFJS RCVIM,751,MSEC1 ;TOPS20AN
DEFJS ASNSQ,752,MSEC1 ;TOPS20AN
DEFJS RELSQ,753,MSEC1 ;TOPS20AN
DEFJS THIBR,770,MSEC1
DEFJS TWAKE,771,MSEC1
DEFJS MRPAC,772,MSEC1
DEFJS SETPV,773,,NIM
DEFJS MTALN,774,MSEC1
DEFJS TTMSG,775,MSEC1

> ;; END OF DEFINE JSLIST

;NOW EXPAND THE JSYS DEFINITIONS

JSLIST
; ERROR CONDITION INSTRUCTIONS. THESE ARE NOP'S UNLESS IMMEDIATELY
; FOLLOWING A JSYS WHICH FAILS.

OPDEF ERJMP [JUMP 16,0] ;JUMP ON ERROR
OPDEF ERCAL [JUMP 17,0] ;CALL ON ERROR (SIMULATE PUSHJ 17,ADR)
    IFNDEF FOR,<
   IFDEF .PSECT,<
   INTERN ERJMP,ERCAL
>>

DEFINE GOPDEF (OP,DEF)<
    OPDEF OP [DEF]
    IFNDEF FOR,<
   IFDEF .PSECT,<
   INTERN OP>>>

; THE FOLLOWING OPCODES ARE USED TO PERFORM THE EXTENDED
; ADDRESSING FUNCTIONS.

GOPDEF XJRSTF,<JRST 5,0> ;RESTORE FLAGS AND PC
GOPDEF XJEN,<JRST 6,0> ;RESTORE FLAGS,PC AND DISMISS
GOPDEF XPCW,<JRST 7,0> ;EXCHANGE FLAGS AND PC
GOPDEF XSFM,<JRST 14,0> ;SAVE PC FLAGS IN MEMORY
GOPDEF XMOVEI,<SETMI 0,0> ;EXTENDED MOVEI
GOPDEF XHLLI,<XMOVEI 0,0> ;INSTRUCTION TO PUT IMMEDIATE ADDRESS IN LH

DEFINE XBLT (A)<
    EXTEND A,[020000,,0]>
    IFIW==:180 ;INSTRUCTION FORMAT INDIRECT WORD
    EFIW==:0 ;EXTENDED FORMAT INDIRECT WORD

; THE NO-OPERATION INSTRUCTION (MAY CHANGE FROM PROCESSOR TO PROCESSOR)

GOPDEF NOP,<TRN 0,0>

; SPECIAL LOSEG SYMBOL FOR PAT

.JBHSO==:75 ; 0 ,, HIGHSEG ORIGIN PAGE NUMBER
MONSYM.MAC

;*****************************************
;JSYS SPECIFIC ARGUMENTS
;THE FOLLOWING ARE ORDERED ALPHABETICALLY BY JSYS NAME
;*****************************************

;ACCES - ACCESS A DIRECTORY (E.G., BY CONNECTING)
AC%CON==:lB0 ;CONNECT TO THE SPECIFIED DIRECTORY
AC%OWN==:lB1 ;GAIN OWNERSHIP
AC%REM==:lB2 ;REMOVE OWNERSHIP

;OFFSETS IN ARGUMENT BLOCK
.ACDIR==:0 ;DIRECTORY DESIGNATOR
.ACPSW==:1 ;POINTER TO PASSWORD STRING
.ACJOB==:2 ;JOB NUMBER (-1 FOR SELF)

;ADBRK - Address break JSYS function codes and bits

;FUNCTION CODES
.ABSET==:0 ;SET USER ADDRESS BREAK
.ABRED==:1 ;READ USER ADDRESS BREAK
.ABCLR==:2 ;CLEAR USER ADDRESS BREAK
.ABGAD==:3 ;GET ADDRESS OF TRAPPED INSTRUCTION

;FUNCTION BITS FOR FUNCTION .ABSET
AB%RED==:lB0 ;READ
AB%WRT==:lB1 ;WRITE
AB%XCT==:lB2 ;EXECUTE

;ALLOC JSYS FUNCTION CODES
.ALCAL==:0 ;ALLOCATE A DEVICE

;ATNVT
.AN%NTP==:lB2 ;TOPS20AN

;ATACH
AT%CCJ==:lB0 ;"C JOB WHEN ATTACHED
AT%NAT==:lB1 ;NO ATTACH
AT%TRM==:lB2 ;ATTACH JOB TO TERMINAL IN REGISTER 4
AT%JOB==:777777B35 ;JOB NUMBER

A-10
;boot

.BTROM==:0
.BTDTE==:0
.BTLD==:1
.BTERR==:1
.BTSEC==:2
.BTLOD==:2
.BTSMP==:2
.BTFLG==:3
.BTBEL==:1B0
.BTcnt==:4
.BTlpt==:5
.BTDMP==:3
.BTDPT==:5
.BTIpr==:4
.BTPRV==:1
.BTTPR==:5
.BTSTS==:6
.BTCOD==:1
.BTBEL==:7
.BTRMP==:10
.BTKML==:11
.BTKMC==:0
.BTKER==:1
.BTKCE==:1B0
.BTKVE==:1B1
.BTKV==:1B2
.BTKCC==:2
.BTKCP==:3
.BTKDC==:4
.BTKDP==:5
.BTKKC==:6
.BTKRP==:7
.BTKSA==:10
.BTKSA==:1B0
.BTKMD==:12
.BTRLC==:13
.BTRPT==:0
.BTZRO==:1B0
.BTZTM==:1
.BTSSC==:2
.BTSCP==:3
.BTRCC==:4
.BTRCP==:5
.BTTC==:6
.BTTCP==:7
.BTCLI==:14
.BTLD==:1
.BTCPN==:15

;activate rom boot
;DTE-20 number
;load secondary bootstrap program
;error flags
;address of secondary bootstrap program
;load memory (obsolete)
;send mop message
;flags
;send to -11 doorbell after setup
;number of bytes to be transferred
;byte pointer to data to be loaded
;dump memory
;byte pointer to destination of dumped data
;initialize communications protocol
;protocol version number
;terminate communications protocol
;return protocol status
;status code
;wait for doorbell
;read mop message
;pointer to destination for mop message
;load KMC11
;KMC11 address
;error flags
;CRAM verify error (RH is bad data)
;DRAM verify error (RH is bad data)
;REG verify error (RH is bad data)
;count of CRAM DATA
;pointer to CRAM DATA (16 bit data)
;count of DRAM DATA
;pointer to DRAM DATA (8 bit data)
;count of register data
;pointer to register data (16 bit data)
;RH is starting address
;is set RH want to start KMC11
;dump KMC11
;return line counters
;port number
;clear counters after reading
;time since counters have been zeroed
;status count count
;status count pointer
;receive count count
;receive count pointer
;transmit count count
;transmit count pointer
;convert lineid to port number
;pointer to ASCII line-id
;convert port number to line-id
; CFORK
CR%MAP==:1B0 ; SET MAP FOR NEW FORK TO POINT TO THIS PROCESS
CR%CAP==:1B1 ; MAKE CAPABILITIES IDENTICAL
CR%ACS==:1B3 ; SET ACS FROM BLOCK
CR%ST==:1B4 ; START PROCESS AT PC
CR%PCV==:777777B35 ; VALUE OF PC

; CHFDB
CF%NUD==:1B0 ; NO UPDATE DIRECTORY
CF%DSP==:777B17 ; FDB DISPLACEMENT
CF%JFN==:777777B35 ; JFN
; CHKAC JSYS DEFINITIONS
; CHKAC FLAG DEFINITIONS
CK%JFN==: IB0 ; JFN IS GIVEN AS AN ARGUMENT
; CHKAC ARGUMENT BLOCK OFFSET VALUES
.CKAAC==: 0 ; ACCESS CODE
.CKALD==: 1 ; LOGGED IN USER NUMBER OF USER
.CKACD==: 2 ; CONNECTED DIR NUMBER OF USER
.CKAEC==: 3 ; ENABLED CAPABILITIES OF USER BEING CHK'D
.CKAUD==: 4 ; DIR NUMBER OF DIRECTORY CONTAINING FILE
.CKAPR==: 5 ; PROTECTION OF FILE
; CHKAC ACCESS CODES
.CKARD==: 0 ; READ AN EXISTING FILE
.CKAWT==: 1 ; WRITE AN EXISTING FILE
.CKAWR==: 1 ; (ANOTHER NAME FOR ABOVE)
.CKAEX==: 2 ; EXECUTE AN EXISTING FILE
.CKAAP==: 3 ; APPEND TO AN EXISTING FILE
.CKADL==: 4 ; GET DIR LISTING OF AN EXISTING FILE
.CKADR==: 6 ; READ THE DIRECTORY
.CKAOF==: 7 ; OPEN FILES IN DIR (NOT IMPLEMENTED)
.CKACN==: 10 ; CONNECT TO A DIR
.CKACF==: 11 ; CREATE FILES IN DIR
; CLOSF
CO%NRJ==: IB0 ; NO RELEASE JFN
CO%WCL==: IB1 ; TOPS20AN ; WAIT UNTIL MATCHING CLS IS RECEIVED
CO%JFN==: 777777B35 ; JFN
; CLZFF
CZ%NIF==: IB0 ; NO INFERIOR FORK FILES
CZ%NSF==: IB1 ; NO SELF FORK FILES
CZ%NRJ==: IB2 ; NO RELEASE JFN
CZ%NCL==: IB3 ; NO CLOSE FILE
CZ%UNR==: IB4 ; UNRESTRICT
CZ%ARJ==: IB5 ; ALWAYS RELEASE JFN
CZ%ABT==: IB6 ; ABORT
CZ%NUD==: IB7 ; NO UPDATE DIRECTORY
CZ%FRH==: 777777B35 ; PROCESS HANDLE
;CNDDIR
CN%CKP==:1B0 ;CHECK PASSWORD ONLY
CN%NOC==:1B1 ;NO CONNECT
CN%JOB==:1B2 ;DOING CONNECT FOR ANOTHER JOB
CN%DIR==:777777B35 ;DIRECTORY NUMBER

;COMND
;COMND - COMMAND STATE BLOCK
.CMFLG==:0 ;USER FLAGS,,REPARSE DISPATCH ADDRESS
.CMIOJ==:1 ;INJFN,,OUTJFN
.CMRTY==:2 ;^R BUFFER POINTER
.CMBFP==:3 ;PTR TO TOP OF BUFFER
.CMTRT==:4 ;PTR TO NEXT INPUT TO BE PARSED
.CMCNT==:5 ;COUNT OF SPACE LEFT IN BUFFER AFTER PTR
.CMINC==:6 ;COUNT OF CHARACTERS FOLLOWING PTR
.CMABP==:7 ;ATOM BUFFER POINTER
.CMABC==:10 ;ATOM BUFFER SIZE
.CMGJB==:11 ;ADR OF GTJFN ARG BLOCK
CM%GJB==:777777 ;ADR OF GTJFN ARG BLOCK

;COMND - FUNCTION DESCRIPTOR BLOCK
.CMFPNP==:0 ;FUNCTION AND POINTER
.CM%FNC==:777B8 ;FUNCTION CODE
.CM%FFL==:777B17 ;FUNCTION-SPECIFIC FLAGS
.CM%LST==:777777 ;LIST POINTER TO OTHER BLOCKS
.CMDAT==:1 ;DATA FOR FUNCTION
.CMHLPP==:2 ;HELP TEXT POINTER
.CMDEF==:3 ;DEFAULT STRING POINTER

;COMND - MACRO FOR BUILDING FUNCTION DESCRIPTOR BLOCK
DEFINE FLDDB. (TYP,FLGS,DATA,HLP,M,DEF,LST)<
   ..XX=<FLD(TYP,CM%FNC)+FLGS+Z LST>
   IFNB <HLP>,<XX=CM%HPP!..XX>
   IFNB <DEF>,<XX=CM%DPP!..XX>
   XX
   IFNB <DATA>,<DATA>
   IFB <DATA>,<O>
   IFNB <HLP>,<POINT 7,[ASCIZ \HLP\]>
   IFB <HLP>,<IFNB <DEF>,<O>
   IFNB <DEF>,<POINT 7,[ASCIZ \DEF\]>>

A-14
;COMND - FLAGS IN .CMFLG
  CM%ESC==:1B0 ; ESC SEEN
  CM%NOP==:1B1 ; NO PARSE
  CM%EOC==:1B2 ; END OF COMMAND SEEN
  CM%RPT==:1B3 ; REPEAT PARSE NEEDED
  CM%SWT==:1B4 ; SWITCH TERMINATED WITH ":"
  CM%PFE==:1B5 ; PREVIOUS FIELD ENDED WITH ESC
  CM%RAI==:1B6 ; RAISE INPUT
  CM%XIF==:1B7 ; EXCLUDE INDIRECT FILES
  CM%WKF==:1B8 ; WAKEUP AFTER EACH FIELD

;FUNCTION BLOCK FLAGS (IN WORD .CMFNP)
  CM%PO==:1B14 ; PARSE-ONLY
  CM%HPP==:1B15 ; HELP POINTER PRESENT
  CM%DPP==:1B16 ; DEFAULT POINTER PRESENT
  CM%SDH==:1B17 ; SUPPRESS DEFAULT HELP MESSAGE

;FLAGS FOR CMDIR FUNCTION
  CM%DWC==:1B0 ; DIRECTORY WILD CARDING ALLOWED

;FLAGS FOR CMTAD FUNCTION
  CM%IDA==:1B0 ; INPUT DATE
  CM%ITM==:1B1 ; INPUT TIME
  CM%NCI==:1B2 ; NO CONVERT TO INTERNAL

;FLAGS IN KEYWORD TABLE (FIRST WORD OF STRING IF B0-6 = 0)
  CM%INV==:1B35 ; INVISIBLE
  CM%NOR==:1B34 ; NO-RECOGNIZE (PLACEHOLDER)
  CM%ABR==:1B33 ; ABBREVIATION FOR ANOTHER ENTRY
  CM%FW==:1B7 ; FLAG WORD (MUST ALWAYS BE ON)
;COMND - FUNCTION CODES

<table>
<thead>
<tr>
<th>Function Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.CMKEY==:0</td>
<td>KEYWORD</td>
</tr>
<tr>
<td>.CMNUM==:1</td>
<td>NUMBER</td>
</tr>
<tr>
<td>.CMNOI==:2</td>
<td>NOISE WORD</td>
</tr>
<tr>
<td>.CMSWI==:3</td>
<td>SWITCH</td>
</tr>
<tr>
<td>.CMIFI==:4</td>
<td>INPUT FILE</td>
</tr>
<tr>
<td>.CMOPF==:5</td>
<td>OUTPUT FILE</td>
</tr>
<tr>
<td>.CMFIL==:6</td>
<td>GENERAL FILESPEC</td>
</tr>
<tr>
<td>.CMFLD==:7</td>
<td>ARBITRARY FIELD</td>
</tr>
<tr>
<td>.CMCFM==:10</td>
<td>CONFIRM</td>
</tr>
<tr>
<td>.CMDIR==:11</td>
<td>DIRECTORY NAME</td>
</tr>
<tr>
<td>.CMUSR==:12</td>
<td>USER NAME</td>
</tr>
<tr>
<td>.CMCMA==:13</td>
<td>COMMA</td>
</tr>
<tr>
<td>.CMINI==:14</td>
<td>INIT LINE</td>
</tr>
<tr>
<td>.CMFLT==:15</td>
<td>FLOATING POINT NUMBER</td>
</tr>
<tr>
<td>.CMDEV==:16</td>
<td>DEVICE NAME</td>
</tr>
<tr>
<td>.CMTXT==:17</td>
<td>TEXT TO ACTION CHAR</td>
</tr>
<tr>
<td>.CMTAD==:20</td>
<td>TIME AND DATE</td>
</tr>
<tr>
<td>.CMQST==:21</td>
<td>QUOTED STRING</td>
</tr>
<tr>
<td>.CUUQS==:22</td>
<td>UNQUOTED STRING</td>
</tr>
<tr>
<td>.CMTOK==:23</td>
<td>TOKEN</td>
</tr>
<tr>
<td>.CMNUX==:24</td>
<td>NUMBER DELIMITED BY NON-DIGIT</td>
</tr>
<tr>
<td>.CMACT==:25</td>
<td>ACCOUNT</td>
</tr>
<tr>
<td>.CMNOD==:26</td>
<td>NODE NAME</td>
</tr>
</tbody>
</table>
MONSYM.MAC

;CRDIR

CD%LEN==:1B0 ;FLAGS , LENGTH OF CRDIR BLOCK
CD%PSW==:1B1 ;SET PASSWORD STRING
CD%LIQ==:1B2 ;SET LOGGED IN QUOTA
CD%PRV==:1B3 ;SET PRIVILEGES
CD%MOD==:1B4 ;SET MODE BITS
CD%LOQ==:1B5 ;SET LOGGED OUT QUOTA
CD%NUM==:1B6 ;SET DIRECTORY NUMBER FROM PARAM BLK
CD%FPT==:1B7 ;SET DEFAULT FILE PROTECTION
CD%DPT==:1B8 ;SET DIRECTORY PROTECTION
CD%RET==:1B9 ;SET DEFAULT RETENTION COUNT
CD%LLD==:1B10 ;SET LAST LOGIN DATE
CD%UGP==:1B11 ;SET USER GROUPS
CD%DGP==:1B12 ;SET DIRECTORY GROUPS
CD%SDQ==:1B13 ;SET SUBDIRECTORY QUOTA
CD%CUG==:1B14 ;SET CREATABLE USER GROUPS
CD%DAC==:1B15 ;SET DEFAULT ACCOUNT
CD%DEL==:1B16 ;DELETE DIRECTORY
CD%APB==:777777B35 ;ADDRESS OF PARAMETER BLOCK
.CDLEN==:0 ;LENGTH OF ARGUMENT BLOCK
.CD%NSQ==:1B0 ;DO NOT UPDATE QUOTAS OF SUPERIOR DIR
.CD%NCE==:1B1 ;DO NOT CHANGE PARAMETERS OF EXISTING DIRS
.CDPSW==:1 ;POINTER TO PASSWORD STRING
.CD%LIQ==:2 ;LOGGED IN QUOTA
.CDPRV==:3 ;PRIVILEGE WORD
.CD%MOD==:4 ;MODE WORD
.CD%DIR==:1B0 ;DIRECTORY NAME FOR CNDIR ONLY (FILES ONLY)
.CD%AHA==:1B1 ;ALPHANUMERIC ACCOUNTS
.CD%RLM==:1B2 ;REPEAT LOGIN MESSAGES
.CDLOQ==:5 ;LOGGED OUT QUOTA
.CDNUM==:6 ;DIRECTORY NUMBER
.CD%FPT==:7 ;DEFAULT FILE PROTECTION
.CD%DPT==:10 ;DIRECTORY PROTECTION
.CD%RET==:11 ;DEFAULT RETENTION COUNT
.CD%LLD==:12 ;LAST LOGIN DATE
.CD%UGP==:13 ;USER GROUPS
.CD%DGP==:14 ;DIRECTORY GROUPS
.CD%SDQ==:15 ;MAXIMUM NUMBER OF SUBDIRECTORIES
.CD%CUG==:16 ;POINTER TO CREATABLE USER GROUP LIST
.CD%DAC==:17 ;POINTER TO DEFAULT ACCOUNT

A-17
MONSYM.MAC

;CRJOB
CJ%LOG==:1B0 ;ATTEMPT TO LOG IN THE NEW JOB
CJ%NAM==:1B1 ;USE NAME AND PSWD IN ARG BLK
CJ%ACT==:3B3 ;WHERE TO GET ACCOUNT
    .CJUCA==:0 ;USE CURRENT ACCT OF CREATOR
    .CJUAA==:1 ;USE ACCOUNT IN ARG BLOCK
    .CJUDA==:2 ;USE DEFAULT ACCOUNT OF NEW USER
CJ%ETF==:1B4 ;PUT EXEC IN TOP FORK
CJ%FIL==:1B5 ;GET FILE IN ARG BLOCK
CJ%ACS==:1B6 ;LOAD THE ACS FROM ARG BLOCK
CJ%OWN==:1B7 ;RETAIN OWNERSHIP OF NEW JOB
CJ%NTA==:1B8 ;NEW JOB WAITS TIL ATTACHED
CJ%NPW==:1B9 ;NO PASSWORD CHECK AT LOGIN TIME
CJ%NUD==:1B10 ;NO UPDATE OF LAST-LOGIN DATE
CJ%SPJ==:1B11 ;DO SPJFN IN NEW JOB FROM ARG BLK
CJ%CAP==:1B12 ;PASS ENABLED CAPABILITIES AS ALLOWED
CJ%CAM==:1B13 ;CAPABILITY MASK AT LOGIN
CJ%SLO==:1B14 ;SIGNAL (IPCF) AT LOGOUT TIME
CJ%DSN==:1B17 ;DISOWN EXISTING JOB # IN 3
    .CJNAM==:0 ;NAME STRING POINTER
    .CJPWS==:1 ;PASSWORD STRING POINTER
    .CJACT==:2 ;ACCOUNT DESIGNATOR/STRING
    .CFIL==:3 ;FILE NAME STRING POINTER
    .CJSFV==:4 ;SFRKV OFFSET
    .CJTTY==:5 ;TTY DESIGNATOR, OR NULL DESIGNATOR
    .CJTIM==:6 ;TIME LIMIT
    .CJACS==:7 ;ADDRESS OF 16. WORDS OF AC'S
    .CJEXF==:10 ;EXEC FLAGS, FOR EXEC AC1
    .CJPRI==:11 ;PRIMARY JFN'S FOR SPJFN IN NEW JOB
    .CJCPU==:12 ;CPU LIMIT (0 IF NONE)
    .CJCAM==:13 ;CAPABILITY MASK TO APPLY TO LOGIN
    .CJSLO==:14 ;PID TO SIGNAL AT LOGOUT TIME
CR%PRA==:2545 ;MAGIC # FOR EXEC/CRJOB LINKAGE VIA PRARG

;CRLNM
    .CLNJ1==:0 ;DELETE 1 LOGICAL NAME FROM JOB
    .CLNS1==:1 ;DELETE 1 LOGICAL NAME FROM SYSTEM
    .CLNJA==:2 ;DELETE ALL JOB WIDTH LOGICAL NAMES
    .CLNSA==:3 ;DELETE ALL SYSTEM LOGICAL NAMES
    .CLNJB==:4 ;CREATE A JOB WIDE LOGICAL NAME
    .CLNSY==:5 ;CREATE A SYSTEM WIDE LOGICAL NAME
MONSYM.MAC

;DELF
DD%DTF==:1B0       ;DELETE TEMPORARY FILES
DD%DNF==:1B1       ;DELETE NONEXISTENT FILES
DD%RST==:1B2       ;REBUILD THE SYMBOL TABLE
DD%CHK==:1B3       ;CHECK THE DIR FOR CONSISTENCY ONLY

;DNLF
DF%NRJ==:1B0       ;DON'T RELEASE JFN
DF%EXP==:1B1       ;EXPUNGE CONTENTS
DF%FGT==:1B2       ;FORGET (EXPUNGE W/O DEASSIGNING ADDRESSES)
DF%DIR==:1B3       ;DELETE, FORGET, AND EXPUNGE A DIRECTORY
DF%JFN==777777B35   ;JFN (ONLY IF ^E-CREATE KILL FAILED)

;DIAG JSYS DEFINITIONS
DG%ADT==:7B2       ;ADDRESS TYPE FIELD
DG%DVC==:177B9      ;DEVICE CODE FIELD
                   
                   
DG%UNI==:77B29      ;UNIT NUMBER
DG%SUN==:77B35      ;SUBUNIT NUMBER

;DIAG JSYS FUNCTION CODES
.DGACU==:1          ;ASSIGN DEVICE
.DGACH==:2          ;ASSIGN CONTROLLER AND ALL DEVICES
.DGRCH==:3          ;RELEASE DEVICE(S)
.DGSCP==:4          ;SETUP CHANNEL PROGRAM
.DGRCP==:5          ;RELEASE CHANNEL PROGRAM
.DGGCS==:6          ;GET CHANNEL STATUS

;DIAG MEM CONTROL FUNCTIONS
.DGGEH==:100        ;LEAVE LARGE HOLE FOR MORE RH20 FUNCTIONS
.DGREM==:101        ;RELEASE MEM (FOR TGHA)

;DSKAS
DA%DEA==:1B0        ;DEASSIGN DISK ADDRESS
DA%ASF==:1B1        ;ASSIGN FREE PAGE
DA%CNV==:1B2        ;CONVERT SOFTWARE TO HARDWARE ADDRESS
DA%HWA==:1B3        ;HARDWARE ADDRESS GIVEN
DA%INI==:1B4        ;INITIALIZE THE BIT TABLE
DA%WRT==:1B5        ;WRITE THE BIT TABLE FILE
DA%ADR==:777777B35  ;DISK ADDRESS
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;DVCHR AND DVCH1 BIT DEFINITIONS

DV%OUT==:lB0 ;DEVICE CAN DO OUTPUT
DV%IN==:lB1 ;DEVICE CAN DO INPUT
DV%DIR==:lB2 ;DEVICE HAS A DIRECTORY
DV%AS==:lB3 ;DEVICE IS ASSIGNABLE
DV%MDD==:lB4 ;DEVICE IS A MULTIPLE DIRECTORY DEVICE
DV%AV==:lB5 ;DEVICE IS AVAILABLE TO THIS JOB
DV%ASN==:lB6 ;DEVICE IS ASSIGNED BY ASND
DV%MDV==:lB7 ;RESERVED (HISTORICAL)
DV%MNT==:lB8 ;DEVICE IS MOUNTED
DV%TYP==:777B17 ;DEVICE TYPE FIELD
DV%MOD==:17777B35 ;DEVICE DATA MODE
DV%M0==:lB35 ;DEVICE CAN BE OPENED IN MODE 0
DV%M1==:lB34 ;DEVICE CAN BE OPENED IN MODE 1
DV%M2==:lB33 ;DEVICE CAN BE OPENED IN MODE 2
DV%M3==:lB32 ;DEVICE CAN BE OPENED IN MODE 3
DV%M4==:lB31 ;DEVICE CAN BE OPENED IN MODE 4
DV%M5==:lB30 ;DEVICE CAN BE OPENED IN MODE 5
DV%M6==:lB29 ;DEVICE CAN BE OPENED IN MODE 6
DV%M7==:lB28 ;DEVICE CAN BE OPENED IN MODE 7
DV%M10==:lB27 ;DEVICE CAN BE OPENED IN MODE 10
DV%M11==:lB26 ;DEVICE CAN BE OPENED IN MODE 11
DV%M12==:lB25 ;DEVICE CAN BE OPENED IN MODE 12
DV%M13==:lB24 ;DEVICE CAN BE OPENED IN MODE 13
DV%M14==:lB23 ;DEVICE CAN BE OPENED IN MODE 14
DV%M15==:lB22 ;DEVICE CAN BE OPENED IN MODE 15
DV%M16==:lB21 ;DEVICE CAN BE OPENED IN MODE 16
DV%M17==:lB20 ;DEVICE CAN BE OPENED IN MODE 17
DV%spl==:lB0 ;DEVICE IS SPOOLED
DV%alc==:lB1 ;DEVICE IS UNDER CONTROL OF ALLOCATOR
DV%vvl==:lB2 ;VOLUME VALID
DV%niu==:lB3 ;DEVICE SLOT IS NOT IN USE (FOR STRUCTURES
; NOT YET MOUNTED)
DV%ini==:lB4 ;DEVICE IS BEING INITIALIZED (STRUCTURE
; IS AVAILABLE ONLY TO THE FORK WHOSE NUMBER
; IS STORED IN SDBSTS)
;DEVICE TYPE DEFINITIONS

>DVDSK==:O
>DVMTA==:2
>DVDTA==:3
>DVPTR==:4
>DVPTP==:5
>DVDS==:6
>DVLPT==:7
>DVCDR==:10
>DVF==:11
>DVTTY==:12
>DVPTY==:13
>DVNUL==:15
>DVNET==:16
>DVPLT==:17
>DVDCN==:22
>DVSRV==:23
>DVATS==:24

;DISK
;MAGTAPE
;DECTAPE
;PAPER TAPE READER
;PAPER TAPE PUNCH
;DISPLAY
;LINE PRINTER
;CARD READER
;FRONT END DEVICE
;TERMINAL
;PTY
;NULL DEVICE
;ARPA NETWORK
;PLOTTER
;DECNET ACTIVE COMPONENT
;DECENT PASSIVE COMPONENT
;APPLICATIONS TERMINAL SERVICE

;DSKOP

DOP%SA==:1B0
DOP%AT==:3B1
.DOPFU==:1
.DOP%CN==:37B6
.DOP%UN==:77B12
.DOP%UA==:37777777
.DOP%S==:2
.DOP%SN==:777B10
.DOP%RA==:17777777
.DOP%EO==:1B10
.DOP%IL==:1B11
.DOP%IR==:1B12
.DOP%WR==:1B14
.DOP%CT==:777777B35

;SOFTWARE ADDRESS
;ADDRESS TYPE FIELD
;PHYSICAL CHANNEL AND UNIT
;CHANNEL NUMBER
;UNIT NUMBER
;UNIT ADDRESS
;STRUCTURE AND RELATIVE ADDRESS
;STRUCTURE NUMBER
;RELATIVE ADDRESS
;ERROR IF UNIT OFFLINE
;INHIBIT ERROR LOGGING
;INHIBIT ERROR RECOVERY
;WRITE
;WORD COUNT

;DUMP/DUMPO

DM%NWT==:1B0
DM%FIN==:1B1
.DM%PTR==:777777B35

;NO WAIT FOR COMPLETION
;FINISH PREVIOUS REQUEST
;***NOT IMPLEMENTED YET***
;POINTER TO COMMAND LIST
;DEFINE DECNET DISCONNECT CODES. THESE ARE STIPULATED BY THE NSP SPEC
;AND MAY HAVE MEANINGS NOT IMPLIED BY THE COMMENTS

.DECX0==:0 ;NO SPECIAL ERROR
.DCX1==:1 ;RESOURCE ALLOCATION FAILURE
.DCX2==:2 ;DESTINATION NODE DOES NOT EXIST
.DCX3==:3 ;NODE SHUTTING DOWN
.DCX4==:4 ;DESTINATION PROCESS DOES NOT EXIST
.DCX5==:5 ;INVALID NAME FIELD
.DCX9==:D9 ;USER ABORT (ASYNCHRONOUS DISCONNECT)
.DCX11==:D11 ;UNDEFINED ERROR CODE
.DCX21==:D21 ;CI WITH ILLEGAL DESTINATION ADDRESS
.DCX22==:D22 ;CC WITH ILLEGAL DESTINATION ADDRESS
.DCX23==:D23 ;CI OR CC WITH ZERO SOURCE ADDRESS
.DCX32==:D32 ;TOO MANY CONNECTIONS TO NDOE
.DCX33==:D33 ;TOO MANY CONNECTIONS TO DEST. PROCESS
.DCX34==:D34 ;ACCESS NOT PERMITTED
.DCX35==:D35 ;LOGICAL LINK SERVICES MISMATCH
.DCX36==:D36 ;INVALID ACCOUNT
.DCX37==:D37 ;SEGSIZE TOO SMALL
.DCX38==:D38 ;PROCESS ABORTED
.DCX39==:D39 ;NO PATH TO DESTINATION NODE
.DCX40==:D40 ;LINK ABORTED DUE TO DATA LOSS
.DCX41==:D41 ;DESTINATION PROCESS DOES NOT EXIST
.DCX42==:D42 ;CONFIRMATION IF DI
.DCX43==:D43 ;IMAGE DATA FIELD TOO LONG

;EFACT - FACT FILE ENTRY DEFINITIONS

.EFHDR==:0 ;HEADER WORD
.EFH%COD==:777B8 ;ENTRY TYPE CODE
.EFH%JOB==:777B17 ;JOB NUMBER
.EFH%LIN==:777B29 ;LINE NUMBER
.EFH%SIZ==:77B35 ;ENTRY SIZE
.EFSUSR==:1 ;USER NUMBER WORD
.EFTAD==:2 ;TIME AND DATE OF ENTRY

; FACT FILE ENTRY TYPE CODES

.EFLGI==:501 ;LOGIN
.EFLGO==:141 ;LOGOUT
.EFCAC==:502 ;CHANGE ACCOUNT
.EFATT==:142 ;CONSOLE ATTACH
.EFDET==:143 ;CONSOLE DETACH
.EFCHK==:201 ;CHECKPOINT
.EFSDU==:540 ;START DISK-UTILIZATION ENTRIES
.EFDSK==:601 ;DISK SPACE UTILIZATION
.EFTIM==:741 ;TIME SET
.EFRES==:740 ;SYSTEM RESTARTED
.EFPLT==:401 ;LINE PRINTER USAGE
.EFCDR==:402 ;CARD READER USAGE
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;ENQ/DEQ BIT DEFINITIONS AND FUNCTION CODES

;FUNCTION CODES

.ENQBL==:0 ;ENQ BLOCK OPTION
.ENQAA==:1 ;ENQ ALLOCATE ONLY IF AVAILABLE
.ENQSI==:2 ;ENQ SOFTWARE INTERRUPT WHEN LOCKED
.ENQMA==:3 ;ENQ MODIFY ACCESS
.DEQDR==:0 ;DEQ RESOURCE
.DEQDA==:1 ;DEQ ALL RESOURCES OF THIS FORK
.DEQID==:2 ;DEQ THIS ID NUMBER
.ENQCS==:0 ;ENQC STATUS
.ENQCG==:1 ;ENQC GET ENQ/DEQ QUOTA FOR A JOB
.ENQCC==:2 ;ENQC CHANGE ENQ/DEQ QUOTA FOR A JOB
.ENQCD==:3 ;ENQC DUMP LOCKS AND QUEUE ENTRIES

;BIT DEFINITIONS

EN%SHR==:1B0 ;SHARABLE REQUEST
EN%BLN==:1B1 ;BYPASS LEVEL NUMBER
EN%NST==:1B2 ;ALLOW NESTING
EN%LTL==:1B3 ;LONG TERM LOCK
EN%LVL==:777B17 ;LEVEL NUMBER
EN%JOB==:777777B35 ;JOB NUMBER
EN%QCE==:1B0 ;ERROR CODE IN RH OF STATUS WORD
EN%QCL==:1B0 ;LOCK DUMP (.ENQCD ONLY)
EN%QCO==:1B1 ;THIS FORK OWNS THE LOCK
EN%QCC==:1B2 ;THIS FORK IS IN THE QUEUE FOR THIS LOCK
EN%QCT==:1B2 ;LOCK CONTAINS A TEXT STRING
EN%QCX==:1B3 ;THE LOCK IS LOCKED EXCLUSIVELY
EN%QCB==:1B4 ;USER IS BLOCKED FOR LOCK

;ENQ/DEQ ARGUMENT BLOCK DATA STRUCTURE

.ENQLN==:0 ;# OF LOCKS ,, LENGTH OF ARGUMENT BLOCK
.ENHLN==:77B5 ;LENGTH OF HEADER AREA
.ENNLK==:7777B17 ;NUMBER OF LOCKS
.ENALN==:777777B35 ;LENGTH OF ARGUMENT BLOCK
.ENQID==:1 ;PSI CHANNEL # ,, REQUEST ID
.ENQLV==:2 ;FLAGS & LEVEL NUMBER ,, JFN, -1, -2, OR -3
.ENQUC==:3 ;STRING POINTER OR USER CODE
.ENQRS==:4 ;# OF RESOURCES IN POOL ,, # OF RESOURCES WANTED
.ENQMS==:5 ;ADDRESS OF RESOURCE BLOCK

A-23
;ENQC DUMP DATA STRUCTURE

;FLAGS + LEVEL #,, OFN, 400000+JOB #, -2, OR -3
;OR: FLAGS + PSI #,, JOB # OF Q-ENTRY CREATOR

;TOTAL RESOURCES IN POOL,, RESOURCES REMAINING
;TIME STAMP OF LAST REQUEST LOCKED
;USER CODE OF LOCK OR START OF TEXT STRING

;GROUP # OR # REQUESTED,, ENQ ID

;FL&OUT/DFOUT
;FORMAT CONTROL WORD

FL&SGN==:3B1 ;FIRST FIELD SIGN CONTROL
.FL_DIG==:0 ;DIGIT
.FLSPC==:1 ;SPACE
.FLPLS==:2 ;PLUS SIGN
.FLSPA==:3 ;SPACE
.FL%JUS==:3B3 ;FIRST FIELD JUSTIFICATION CONTROL
.FLLLSP==:0 ;LEADING SPACES
.FLLZR==:1 ;LEADING ZEROS
.FLLAS==:2 ;LEADING A Sterisks
.FLSPA==:3 ;SPACE
.FL%ONE==:1B4 ;FIRST FIELD NONBLANK
.FL%DOL==:1B5 ;DOLLAR SIGN PREFIX
.FL%PNT==:1B6 ;DECIMAL POINT
.FL%EXP==:3B8 ;THIRD FIELD EXPONENT CONTROL
.FLEXN==:0 ;NO EXPONENT
.FLEXE==:1 ;E EXPONENT PREFIX
.FLEXD==:2 ;D EXPONENT PREFIX
.FLEXM==:3 ;*10^ EXPONENT PREFIX
.FL%ESG==:3B10 ;EXPONENT SIGN CONTROL
.FL_DGE==:0 ;DIGIT
.FLPLE==:1 ;PLUS SIGN
.FLSPC==:2 ;SPACE
.FL_DGT==:3 ;DIGIT
.FL%OVL==:1B11 ;COLUMN OVERFLOW
.FL%RND==:37B17 ;DIGIT POSITION FOR ROUNING
.FL%SST==:77B23 ;FIRST FIELD WIDTH
.FL%SNND==:77B29 ;SECOND FIELD WIDTH
.FL%THD==:77B35 ;THIRD FIELD WIDTH
MONSYM.MAC

;GDSTS
;SEE MTOPR FOR CARD READER AND LINE PRINTER STATUS BITS
;SEE GENERAL FIELD AND VALUE SECTION FOR MAGTAPE STATUS BITS
;SEE TOPS20AN SECTION FOR NETWORK STATUS BITS
.GDFSMI==:17B3 ;TOPS20AN ;FINITE MACHINE STATE

;GET
GT%ADR==:lB19 ;USE ADDRESS LIMITS IN AC2
GT%PRL==:1B20 ;PRELOAD PAGES
GT%NOV==:1B21 ;DON'T OVERLAY EXISTING PAGES
GT%FL2==:1B22 ;IF ON, AC3 CONTAINS FLAGS

A-25
; GETAB - TABLE INDICES

; JOB NUMBER TO TTY NUMBER
JOBTT==:0

; JOB RUNTIME
JOBRT==:1

; TICKS PER SECOND
TICKP==:2

; JOB NUMBER TO DIRECTORY NUMBERS (OBS)
JOBDI==:3

; TTY NUMBER TO JOB NUMBER
TTYJO==:4

; NUMBER PHYSICAL CORE PAGES
NCPGS==:5

; DEVICE NAME
DEVNA==:6

; DEVICE CHARACTERISTICS
DEVCH==:7

; DEVICE UNIT NUMBERS
DEVUN==:10

; DISK ERROR WORDS
DSKER==:11

; DRUM ERROR WORDS
DRMER==:12

; VERSION TEXT
SYSVE==:13

; STATISTICS
SYSTA==:14

; SCHED QUEUE TIMES
QTIME==:15

; JOB NUMBER TO PROGRAM NAME
JOBNA==:16

; SUBSYSTEM NAME
SNAME==:17

; " TIME
STIME==:20

; " PAGE FAULTS
SPFLT==:21

; " SIZE INTEGRAL
SSIZE==:22

; " NUMBER WAKEUPS
SNBLK==:23

; DBUGSW, DCHKSW
DBGUS==:24

; LOG, JOB 0 DESIGNATORS
LOGDE==:25

; PTTY PARAMETERS
PTYPA==:26

; GTTAB SYMBOL TABLE
SYMTA==:27

; HSYS VARIABLES
DNTL==:30

; JOB NUMBER TO PROGRAM NAME
JOBPN==:31

; MONITOR BUILD TIME AND DATE
BLTOD==:32

; LAST DIR NUMBER ASSIGNED (OBS)
LSTDR==:33

; APR SERIAL NUMBER
APRID==:34

; HIGH QUEUE LOAD AVERAGES
HQLAV==:35

; LOW QUEUE LOAD AVERAGES
LQLAV==:36

; TOPS20AN ARPANET STATUS
.NETRD==:37

; TOPS20AN HOST READY
.IMPHR==:40

; TOPS20AN DEAD HOST STATUS
.HSTST==:41

; TOPS20AN HOST NAMES
.HSTNA==:42

; TOPS20AN HOST NAME INDEX
.HOSTN==:43

; TOPS20AN LOCAL SOCKET
.NETLS==:44

; TOPS20AN FOREIGN SOCKET
.NETFS==:45

; TOPS20AN ARPA CONNECTION ADDRESS
.NETAW==:46

; TOPS20AN BIT ALLOCATION
.NETBA==:47

; TOPS20AN CONNECTION STATUS
.NETST==:50

; TOPS20AN ARPANET BUFFERS
.NETBU==:51

; TOPS20AN BYTE COUNT STATISTICS
.NETBT==:52

; TOPS20AN IMP LINK TABLE ONE
.IMPL1==:53

; TOPS20AN IMP LINK TABLE TWO
.IMPL2==:54

; TOPS20AN IMP LINK TABLE THREE
.IMPL3==:55

; TOPS20AN IMP LINK TABLE FOUR
.IMPL4==:56

; TOPS20AN LOCAL HOST NUMBER
.LHOST==:57

; OWNING JOB
.JBONT==:60

; DEFAULT SWAPPING PAGES
.NSWPG==:61
; GETJI

.JIJNO==: 0 ; JOB NUMBER
.JITNO==: 1 ; TERMINAL NUMBER
.JIUNO==: 2 ; USER NUMBER
.JIDNO==: 3 ; DIRECTORY NUMBER
.JISNM==: 4 ; SUBSYS NAME
.JIPNM==: 5 ; PROGRAM NAME
.JIRT==: 6 ; RUN TIME
.JICPJ==: 7 ; CONTROLLING PTY JOB NUMBER
.JIRTL==: 10 ; RUN TIME LIMIT (SET BY TIMER JSYS)
.JIBAT==: 11 ; CONTROLLED BY BATCH
.JIDEN==: 12 ; MAGTAPE DEFAULT DENSITY
.JIPAR==: 13 ; MAGTAPE DEFAULT PARITY
.JIDM==: 14 ; MAGTAPE DEFAULT DATA MODE
.JIRS==: 15 ; MAGTAPE DEFAULT RECORD SIZE
.JIDFS==: 16 ; DEFERRED SPOOLING
.JILNO==: 17 ; LOGGED-IN DIRECTORY NUMBER
.JISRM==: 20 ; POINTER TO JOB SESSION REMARK
.JILLN==: 21 ; LAST LOGIN DATE & TIME
.JISR==: 22 ; JOB RUNTIME AT START OF THIS ACCOUNTING SESSION
.JISCT==: 23 ; JOB CONSOLE TIME AT START OF THIS SESSION

; GFRKS

GF1GFH==: 1B0 ; GET RELATIVE FORK HANDLES
GF1GFS==: 1Bl ; GET FORK STATUS

; GFUST

.GFAUT==: 0 ; GET FILE AUTHOR
.GFLWR==: 1 ; GET FILE LAST WRITER

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; GTJFN DEFINITIONS

; FLAGS PROVIDED TO GTJFN ON CALL

GJ%FOU==:1B0 ; FILE IS FOR OUTPUT USE
GJ%NEW==:1B1 ; NEW FILE ONLY
GJ%OLD==:1B2 ; OLD FILE ONLY
GJ%MSG==:1B3 ; PRINT AN APPROPRIATE MESSAGE
GJ%CFM==:1B4 ; CONFIRMATION IS REQUIRED
GJ%TMP==:1B5 ; TEMPORARY
GJ%NS==:1B6 ; DONT SEARCH SEARCH LISTS
GJ%ACC==:1B7 ; NO ACCESS BY OTHER FORKS
GJ%DEL==:1B8 ; IGNORE "DELETED" BIT
GJ%JFN==:3B10 ; JFN USE FIELD
.GJDNUR==:0 ; DO NOT USE JFN PROVIDED
.GJERR==:2 ; ERROR IF CANNOT USE JFN PROVIDED
.GJALT==:3 ; USE ALTERNATE IF CANNOT USE GIVEN JFN
GJ%IFG==:1B11 ; ACCEPT INPUT FILE GROUP DESCRIPTORS
GJ%OFG==:1B12 ; ACCEPT OUTPUT FILE GROUP DESCRIPTORS
GJ%FLG==:1B13 ; RETURN FLAGS
GJ%PHY==:1B14 ; PHYSICAL DEVICE ONLY
GJ%XTN==:1B15 ; EXTENDED FORMAT (E+11 EXISTS)
GJ%FNS==:1B16 ; ACCUMULATOR Z CONTAINS JOB FILE NUMBERS
GJ%SHT==:1B17 ; SHORT CALL FORMAT

; FLAGS PROVIDED TO GTJFN (IN SECOND FLAG WORD)

G1%RND==:1B0 ; RETURN ON NULL (IN ALTERNATE FLAG WORD)
G1%RBF==:1B1 ; ^R BUFFER IS DISJOINT (OBSOLETE)
G1%NLN==:1B2 ; NO LONG NAMES
G1%RCM==:1B3 ; RETURN CONFIRM MESSAGE
G1%RIE==:1B4 ; RETURN WHEN MAIN STRING IS EMPTY
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;FLAGS RETURNED BY GTJFN

GJ%DEV==:1B0 ;ASTERISK WAS GIVEN FOR DEVICE
GJ%UNT==:1B1 ;ASTERISK WAS GIVEN FOR UNIT
GJ%DIR==:1B2 ;ASTERISK WAS GIVEN FOR DIRECTORY
GJ%NAM==:1B3 ;ASTERISK WAS GIVEN FOR NAME
GJ%EXT==:1B4 ;ASTERISK WAS GIVEN FOR EXTENSION
GJ%VER==:1B5 ;ASTERISK WAS GIVEN FOR GENERATION
GJ%UHV==:1B6 ;USE HIGHEST GENERATION
GJ%NHV==:1B7 ;USE NEXT HIGHER GENERATION
GJ%ULV==:1B8 ;USE LOWEST GENERATION
GJ%PRO==:1B9 ;PROTECTION GIVEN
GJ%ACT==:1B10 ;ACCOUNT GIVEN
GJ%TFS==:1B11 ;TEMPORARY FILE SPECIFIED (;T)
GJ%GND==:1B12 ;COMPLEMENT OF GJ%DEL ON CALL

;GTJFN TABLE OFFSETS

.GJGEN==:0 ;FLAGS ,, GENERATION
.GJNHF==:<Z 0> ;DEFAULT GENERATION
.GJNHEG==:<Z -1> ;NEXT HIGHER GENERATION
.GJLEG==:<Z -2> ;LOWEST EXISTING GENERATION
.GJALL==:<Z -3> ;ALL GENERATIONS (I.E., ;*)
.GJSRC==:1 ;SOURCE JFN,, OUTPUT JFN
.GJDEV==:2 ;DEFAULT DEVICE
.GJDIR==:3 ;DEFAULT DIRECTORY
.GJNAM==:4 ;DEFAULT NAME
.GJEXT==:5 ;DEFAULT EXTENSION
.GJPRO==:6 ;DEFAULT PROTECTION
.GJACT==:7 ;DEFAULT ACCOUNT
.GJJFN==:10 ;DESIRED JFN
.GJFZ==:11 ;SECOND GROUP FLAGS,,COUNT
.GJCPP==:12 ;COPY BUFFER POINTER
.GJCP==:13 ;COPY BUFFER COUNT
.GJRTY==:14 ;RETYPE (~R) POINTER
.GJBFP==:15 ;TOP OF BUFFER POINTER
.GJATR==:16 ;POINTER TO ARBITRARY ATTRIBUTE BLOCK

;GNJFN - FLAGS RETURNED

.GN%STR==:1B13 ;STRUCTURE CHANGED
.GN%DIR==:1B14 ;DIRECTORY CHANGED
.GN%NAM==:1B15 ;NAME CHANGED
.GN%EXT==:1B16 ;EXTENSION CHANGED

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; GTRPW
PF%USR==:1B0 ; PAGE FAIL WORD - USER MODE REFERENCE
PF%WRT==:1B5 ; " - WRITE REFERENCE
TSW%RD==:1B14 ; TRAP STATUS WORD - READ
TSW%WT==:1B15 ; " - WRITE
TSW%WR==:1B15 ; (ANOTHER NAME FOR ABOVE)
TSW%EX==:1B16 ; " - EXECUTE
TSW%MN==:1B17 ; " - MONITOR MODE REFERENCE

; GTSTS BITS RETURNED IN 2
GS%OPN==:1B0 ; FILE IS OPEN
GS%RDF==:1B1 ; IF OPEN, FILE IS OPEN FOR READ
GS%WRF==:1B2 ; IF OPEN, FILE IS OPEN FOR WRITE
GS%XCF==:1B3 ; IF OPEN, FILE IS OPEN FOR EXECUTE
GS%RND==:1B4 ; OK TO RESET BYTE POINTER
GS%APT==:1B5 ; (FILE IS NOT APPEND)
GS%CAL==:1B6 ; ACCESS PER PAGE TABLE
GS%LNG==:1B7 ; (NOT IMPLEMENTED -- OBSOLETE)
GS%EOF==:1B8 ; OK TO CALL AS A PROCEDURE
GS%ERR==:1B9 ; (NOT IMPLEMENTED -- OBSOLETE)
GS%NAM==:1B10 ; FILE IS LONG
GS%AST==:1B11 ; AT END OF FILE ON READ
GS%ASG==:1B12 ; FILE MAY BE IN ERROR
GS%HLT==:1B13 ; ONE OR MORE FIELDS OF NAME
GS%FRK==:1B17 ; IS WILD
GS%MOD==:17B35 ; JFN IS BEING ASSIGNED
.GSNRM==:0 ; TERMINATE ON I/O ERROR
.GSIMG==:10 ; DATA MODE
.GSNDMP==:17 ; DATA MODE
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;HPTIM
.HHELP=:0 ;ELAPSED TIME
.HPRNT=:1 ;RUN TIME

;IDCNV (ALSO IDTNC AND ODCNV)
IC%DSA==:1B0 ;DAYLIGHT SAVINGS IF APPROPRIATE
IC%ADS==:1B1 ;APPLY DAYLIGHT SAVINGS
IC%UTZ==:1B2 ;USE TIME ZONE GIVEN
IC%JUD==:1B3 ;USE JULIAN DATE CONVERSION
IC%TMZ==:77B17 ;TIME ZONE
IC%TIM==777777B35 ;LOCAL TIME

;IDTIM & IDTNC
IT%NDA==:1B0 ;NO DATE
IT%NNM==:1B1 ;NO NUMERIC MONTH
IT%SNM==:1B2 ;SECOND NUMBER IS MONTH
IT%ERR==:1B3 ;ERROR IF NUMBERS ARE NOT IN SPECIFIED
; ORDER
IT%NTI==:1B6 ;NO TIME
IT%NIS==:1B7 ;NO SECONDS
IT%NAC==:1B8 ;ALWAYS INCLUDE SECONDS
IT%AAC==:1B9 ;NO COLON ALLOWED BETWEEN HH AND MM
IT%AMS==:1B10 ;ALWAYS ALLOW COLON
IT%AHM==:1B11 ;ALWAYS INTERPRET ONE COLON AS HHMM:SS
IT%N24==:1B12 ;ALWAYS INTERPRET ONE COLON AS HH:MM
IT%NTM==:1B14 ;NO 24-HOUR FORMAT
IT%NTZ==:1B15 ;NO TIME MODIFIER (AM, PM)
IT%NIS==:1B16 ;NO TIME ZONE

;INLNM
.INLJB=:0 ;GET JOB WIDE LOGICAL NAME FROM INDEX
.INLSY=:1 ;GET SYSTEM LOGICAL NAME FROM INDEX
; IPCF BIT DEFINITIONS AND DATA STRUCTURES

; PACKET FORMAT

; .IPCFL==:0 ; FLAGS WORD
; .IPCFD==:1B0 ; DON'T BLOCK READ
; .IPCFS==:1B1 ; INDIRECT SENDER'S PID
; .IPCFR==:1B2 ; INDIRECT RECEIVER'S PID
; .IPCFO==:1B3 ; OVERDRAW SEND
; .IPCTL==:1B4 ; TRUNCATE ON TOO LARGE MESSAGE
; .IPCPD==:1B5 ; CREATE A PID ON THE SEND
; .IPJWP==:1B6 ; MAKE THE CREATED PID BE JOB WIDE
; .IPNOA==:1B7 ; NO ACCESS OF PID BY OTHER FORKS
; .IPCPP==:1B18 ; SENDER IS PRIV'D AND IS ENVOKING PRIVS
; .IPCPF==:1B19 ; PAGE TRANSFER MODE
; .IPCFZ==:1B20 ; ZERO LENGTH MESSAGE WAS SENT
; .IPCFE==:77B29 ; ERROR FIELD

; ERRORS SENT BY INFO

; .IP CPI==:15 ; INSUFFICIENT PRIVILEGE
; .IPCUFF==:16 ; ILLEGAL FUNCTION
; .IPCFSN==:67 ; SEND INFO YOUR NAME
; .IPCFF==:72 ; INFO FREE SPACE EXHAUSTED
; .IPCBB==:74 ; PID HAS NO NAME OR IS ILLEGAL
; .IPCDN==:75 ; DUPLICATE NAME
; .IPCNN==:76 ; UNKNOWN NAME
; .IPCEN==:77 ; ILLEGAL NAME
; .IPCFCC==:7B32 ; SYSTEM SENDER CODE
; .IPCCC==:1 ; SENT BY [SYSTEM] IPCF
; .IPCPP==:2 ; SENT BY SYSTEM WIDE [SYSTEM] INFO
; .IPCPP==:3 ; SENT BY RECEIVER'S [SYSTEM] INFO
; .IPCFM==:7B35 ; SPECIAL MESSAGE RETURN FIELD
; .IPCFN==:1 ; MESSAGE WAS NOT DELIVERED
; .IPCF==:1 ; PID OF SENDER
; .IPCPF==:2 ; PID OF RECEIVER
; .IPCFP==:3 ; POINTER TO MESSAGE BLOCK
; .IPCFD==:4 ; LOGGED IN DIR OF SENDER
; .IPCFK==:5 ; ENABLED CAPABILITIES OF SENDER
; .IPCF==:6 ; CONNECTED DIRECTORY NUMBER OF SENDER
; .IPCA==:7 ; POINTER TO ACCOUNT STRING OF SENDER
; .IPCSU==:26 ; SPOOL MESSAGE CODE FROM IPCC
; .IPCSL==:27 ; LOGOUT MESSAGE CODE FROM IPCC
; .IPCSSA==:30 ; RESOURCE ALLOCATOR MESSAGE CODE
; .IPCSR==:31 ; STRUCTURE DISMOUNT MESSAGE CODE FROM IPCC
; .IPCLI==:32 ; LOGIN MESSAGE CODE FROM IPCC
; .IPCLM==:33 ; LOGOUT MESSAGE TO CREATOR FROM IPCC
; .IPCKP==:34 ; DELETED PID MESSAGE FROM IPCC
; .IPCCA==:35 ; CREATE AN APPLICATION (RESERVED FOR TPS USE)
; .IPCSS==:15 ; IPCC REQUEST TO INFO TO DELETE PIDS

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; [SYSTEM] INFO DEFINITIONS

CODE,,FUNCTION
FIND PID FOR NAME
FIND NAME FOR PID
ASSIGN NAME TO PID
ASSIGN NAME TO PID
MONITOR DROP PID FUNCTION
PID TO GET A COPY OF REPLY
START OF DATA

; JFNS

DEVICE FIELD OUTPUT CONTROL
DIRECTORY FIELD OUTPUT CONTROL
NAME FIELD OUTPUT CONTROL
FILE TYPE FIELD OUTPUT CONTROL
GENERATION FIELD OUTPUT CONTROL
PROTECTION FIELD OUTPUT CONTROL
ACCOUNT FIELD OUTPUT CONTROL

NEVER OUTPUT FIELD
ALWAYS OUTPUT FIELD
SUPPRESS IF SYSTEM DEFAULT
RETURN ;F IF TEMP FILE
RETURN SIZE
RETURN CREATION DATE
RETURN LAST WRITE
RETURN LAST READ
AC 2 HOLDS STRING POINTER NOT JFN
RETURN ATTRIBUTES
RETURN 1 SPECIFIC ATTRIBUTE
PUNCTUATE SIZE AND DATE
TAB BEFORE FIELDS RETURNED
TAB BEFORE POSSIBLE FIELDS
PUNCTUATE ALL FIELDS

; LNMST

GET JOB WIDE DEFINITION OF A LN
GET SYSTEM DEFINITION OF A LOGICAL NAME

; LOCK

USE COUNT IN AC3
USE AC1 AS PHYSICAL PAGE NUMBER
MAP PAGES CACHE INHIBITED
ALLOW LOCKING IN OFFLINE PAGES
; MSTR

; READ STATUS OF NEXT DISK UNIT
.MSRNU==:0

; READ STATUS OF A DISK UNIT
.MSRUS==:1

; CHANNEL NUMBER
.MSRCH==:0

; CONTROLLER NUMBER
.MSRTC==:1

; UNIT NUMBER
.MSRUN==:2

; STATUS
.MSRST==:3

; THIS UNIT IS PART OF A MOUNTED STRUCTURE
MS%MNT==:1B0

; THIS UNIT WRITTEN IN 16-BIT MODE
MS%16B==:1B1

; (RESERVED FOR FUTURE)

; THIS UNIT IS CURRENTLY IN USE BY AN ON-LINE DIAGNOSTIC
.MS%DIA==:1B2

; THIS UNIT IS OFF-LINE
.MS%OFL==:1B3

; THERE WAS AN ERROR READING THIS UNIT
.MS%ERR==:1B4

; ONE OF THE BAT BLOCKS IS BAD
.MS%BBB==:1B5

; ONE OF THE HOME BLOCKS IS BAD
.MS%HBB==:1B6

; UNIT IS WRITE-LOCKED
.MS%WLK==:1B7

; DISK TYPE CODE
.MSTYP==:77B17

; DEFINED THE SAME AS .UTTXX IN PHYPAR

; MOUNT A STRUCTURE
.MSTMNT==:2

; NAME OF STRUCTURE
.MSTNM==:0

; ALIAS NAME
.MSTA==:1

; NUMBER OF UNITS IN STRUCTURE
.MSTNU==:2

; FLAGS (LHS)
.MSTFL==:2

; MASK FOR .MSTFL
.MSF%FLG==:777777,0

; NO FIX BAD HOME BLOCK
.MSF%NFH==:1B0

; NO FIX BAD BAT BLOCK
.MSF%NFBB==:1B1

; MOUNT FOR EXCLUSIVE USE BY JOB
.MSF%XEB==:1B2

; IGNORE ERRORS
.MSF%IGN==:1B3

; START OF UNIT INFORMATION
.MSTUI==:3

; CHANNEL NUMBER
.MSTCH==:0

; CONTROLLER NUMBER
.MSTCT==:1

; UNIT NUMBER
.MSTUN==:2

; # OF ARGUMENT WORDS/UNIT
.MSTNO==:3

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; DISMOUNT A STRUCTURE
; NAME OF STRUCTURE

; GET STATUS OF A STRUCTURE
; STRUCTURE NAME (ALIAS)
; STATUS
; STRUCTURE IS A PUBLIC STRUCTURE
; STRUCTURE IS BEING DISMOUNTED
; STRUCTURE IS DOMESTIC
; STRUCTURE IS THE PRIMARY PUBLIC STRUCTURE
; STRUCTURE IS BEING INITIALIZED
; STRUCTURE LIMITED TO 2050 SIZES
; NUMBER OF UNITS IN STRUCTURE
; MOUNT COUNT
; OPEN FILE COUNT
; STRUCTURE ID
; LENGTH OF ARGUMENT BLOCK

; SET STATUS OF A STRUCTURE
; STRUCTURE NAME
; NEW STATUS BITS
; MASK WORD OF BITS TO BE CHANGED
; LENGTH OF ARGUMENT BLOCK

; INITIALIZE A STRUCTURE
; NAME OF STRUCTURE
; ALIAS NAME
; NUMBER OF UNITS IN STRUCTURE
; FLAGS (LHS)
; FLAGS DEFINED IN .MSMNT FUNCTION
; FUNCTION CODE
; CREATE NEW FILE SYSTEM
; RECONSTRUCT THE ROOT-DIRECTORY
; WRITE THE HOME BLOCKS
; REBUILD INDEX TABLE (IDXFIL)

; START OF UNIT INFORMATION
; CHANNEL NUMBER
; CONTROLLER NUMBER
; UNIT NUMBER
; # OF ARGUMENT WORDS/UNIT
; STATUS WORD
; NUMBER OF PAGES FOR SWAPPING ON THIS UNIT
; NUMBER OF PAGES FOR FRONT-END FILE SYSTEM
; UNIT ID
; OWNER ID
; FILE SYSTEM ID
; NUMBER OF PAGES FOR BOOTSTRAP.BIN (OPTIONAL)

; INCREMENT MOUNT COUNT
; DECREMENT MOUNT COUNT
; DEVICE DESIGNATOR OR STRUCTURE

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; GET STRUCTURE USERS
; POINTER TO ALIAS OF STRUCTURE
; FLAGS, # OF ITEMS RETURNED
; GET USERS WHO HAVE ACCESSED STRUCTURE
; GET USERS WHO HAVE MOUNTED STRUCTURE
; GET USERS WHO ARE CONNECTED TO STRUCTURE
; FIRST JOB NUMBER RETURNED

; MODIFY HOMEBLOCK WORD
; POINTER TO ALIAS, OR DESIGNATOR FOR ALIAS
; OFFSET INTO HOMEBLOCK OF WORD BEING CHANGED
; NEW VALUES FOR BITS BEING CHANGED
; MASK DECLARING WHICH BITS BEING CHANGED
;MONSYM.MAC

;MTOPR - FUNCTION CODES

.MOCLE==:0 ;CLEAR ERRORS
.MONOP==:31 ;NOP (WAIT FOR ACTIVITY TO STOP)
.MOREW==:1 ;REWRITE
.MOEOF==:3 ;WRITE EOF
.MODTE==:4 ;ASSIGN FE DEVICE TO A DTE
.MOFWR==:6 ;FORWARD SPACE RECORD
.MOBKR==:7 ;BACKSPACE RECORD
.MORUL==:11 ;REWRITE AND UNLOAD
.MOERS==:13 ;ERASE TAPE
.MOFWF==:16 ;FORWARD SPACE FILE
.MOBKF==:17 ;BACKSPACE FILE
.MOSP==:26 ;SET TTY SPEED (FOR KL ONLY)
.MORS==:27 ;READ LINE SPEED (FOR KL ONLY)
    MO%RMT==:1B0 ;FLAG TO SAY LINE IS REMOTE
    MO%AUT==:1B1 ;FLAG TO SAY LINE IS "AUTO" SPEED
        (RSX20F ONLY)
.MOSDR==:2 ;SET READ DIRECTION
.MORDR==:26 ;READ READ DIRECTION
.MOOET==:10 ;SKIP TO LOGICAL END OF TAPE
.MORSRS==:5 ;SET RECORD SIZE
.MORSR==:15 ;READ RECORD SIZE
.MORDN==:12 ;READ DENSITY
.MORDDN==:4 ;READ DENSITY
.MORDM==:14 ;READ DATA MODE
.MORSPP==:20 ;SET PARITY
.MORPR==:21 ;READ PARITY
.MONRB==:22 ;GET NUMBER OF REMAINING BYTES IN RECORD
.MOFPO==:23 ;FORCE OUT RECORD
.MOINF==:25 ;GET INFORMATION ABOUT TAPE
    .MOICT==:0 ;COUNT OF ARGUMENTS TO BE RETURNED
    .MOITP==:1 ;MAGTAPE TYPE CODE

; DEFINED THE SAME AS .UTTXX IN PHYPAR
    .MTT45==:3 ;MAGTAPE TYPE TU45
    .MTT70==:17 ;MAGTAPE TYPE TU70
    .MTT71==:20 ;MAGTAPE TYPE TU71
    .MTT72==:21 ;MAGTAPE TYPE TU72
    .MOID==:2 ;MAGTAPE REEL ID
    .MOISN==:3 ;CHAN, CONTROLLER, UNIT ,, SERIAL #
    .MOIRD==:4 ;# OF READS DONE
    .MOIWT==:5 ;# OF WRITES DONE
    .MOIRC==:6 ;RECORD # FROM BOT
    .MOIFC==:7 ;FILE COUNT ON TAPE
    .MOISR==:10 ;# OF SOFT READ ERRORS
    .MOISW==:11 ;# OF SOFT WRITE ERRORS
    .MOIHR==:12 ;# OF HARD READ ERRORS
    .MOIHw==:13 ;# OF HARD WRITE ERRORS
    .MOPS==:27 ;SET ERROR PSI FOR LPT AND CDR
    MO%MSG==:1B0 ;SUPPRESS STANDARD CTY MESSAGES
    .MOISD==:27 ;SET REEL I.D.
    .MOIEL==:30 ;INHIBIT ERROR LOGGING

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.MOLVF==:32 ; LOAD DEVICE'S VFU
.MORVF==:33 ; READ VFU FILE NAME
.MOLTTR==:34 ; LOAD TRANSLATION RAM
.MORTTR==:35 ; READ RAM FILE NAME
.MOSTS==:36 ; SET SOFTWARE STATUS
.MORST==:37 ; READ SOFTWARE STATUS
.MO%LFC==:1 ; PAGE COUNTER OVERFLOW
.MO%LCI==:2 ; CHARACTER INTERRUPT (HARD ERROR)
.MO%LVF==:4 ; VFU ERROR. PAPER MUST BE RE-ALIGNED
.MO%LVU==:20 ; LINE PRINTER HAS OPTICAL VFU
.MO%RPE==:40 ; RAM PARITY ERROR
.MO%RCK==:1 ; READ CHECK
.MO%PCK==:2 ; PICK CHECK
.MO%SCK==:4 ; STACK CHECK
.MO%HEM==:10 ; HOPPER EMPTY
.MO%SPL==:20 ; STACKER FULL
.MO%FNX==:1B17 ; NON-EXISTENT DEVICE
.MO%OL==:1B16 ; DEVICE IS OFF-LINE
.MO%HE==:1B15 ; HARDWARE ERROR
.MO%SER==:1B14 ; SOFTWARE ERROR
.MO%IOF==:1B13 ; I/O IN PROGRESS
.MO%EOF==:1B12 ; END OF FILE
; 1B11 ; RESERVED
.MO%FER==:1B10 ; FATAL ERROR
.MO%LCP==:1B0 ; LOWER CASE PRINTER
.MO%RLD==:1B1 ; FRONT-END WAS RELOADED
.MOFLO==:40 ; FLUSH OUTPUT

; SEE SETJB FOR VARIOUS ARGUMENT VALUES

.MOSNT==:34 ; SET TTY NON-TERMINAL STATUS
 .MOSMN==:1 ; NO SYSTEM MESSAGES (I.E. SUPPRESS)
 .MOSMY==:0 ; YES SYSTEM MESSAGES (DEFAULT)
 .MORNT==:35 ; READ TTY NON-TERMINAL STATUS

; PTY MTOPR NUMBERS

.MOAPI==:24 ; ASSIGN PTY INTERRUPT CHANNELS
 .MOXWFI==:1B0 ; ENABLE WAITING FOR INPUT
 .MOXIR==:1B1 ; ENABLE OUTPUT IS WAITING
 .MOXIC==:7B17 ; SOFTWARE INTERRUPT CHANNEL
 .MOPIH==:25 ; TEST PTY INPUT HUNGRY
 .MONWI==:0 ; NOT WAITING FOR INPUT
 .MOWFI==:-1 ; WAITING FOR INPUT
 .MOBAT==:26 ; SET BATCH BIT
 .MOJCB==:1 ; JOB CONTROLLED BY BATCH
 .MONCB==:0 ; JOB NOT CONTROLLED BY BATCH

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; TTY MODE DEFINITIONS

.MORLW==:30  ;READ WIDTH
.MOSLW==:31  ;SET WIDTH
.MORLL==:32  ;READ LENGTH
.MOSSL==:33  ;SET LENGTH
.MOSIG==:36  ;SET "IGNORE INPUT WHEN INACTIVE" BIT
.MORBM==:37  ;READ 128 CHARACTER BREAK MASK

.MOWN1==:776117,,777740  ;BIT DEFINITIONS FOR NON-FORMATI NG CONTROL
.MOWN2==:0  ;FOR ASCII CODES 40-777
.MOWN3==:0  ;FOR ASCII CODES 100-137
.MOWN4==:20  ;FOR ASCII CODES 137-177

.MOWF1==:001260,,000420  ;FORMATTING CONTROL BITS
.MOWF2==:0  ;FOR ASCII CODES 40-77
.MOWF3==:0  ;FOR ASCII CODES 100-137
.MOWF4==:20  ;FOR ASCII CODES 140-177

.MOWP1==:000400,,400  ;PUNCTUATION BIT DEFINITIONS
.MOWP2==:777774,,001760  ; FOR ASCII CODES 40-77
.MOWP3==:400000,,000760  ; FOR ASCII CODES 100-137
.MOWP4==:400000,,000760  ; FOR ASCII CODES 140-177

.MOWA1==:400  ;ALPHANUMERIC DEFINITIONS
.MOWA2==:00003,,776000  ; FOR ASCII CODES 40-77
.MOWA3==:377777,,777000  ; FOR ASCII CODES 100-137
.MOWA4==:377777,,777020  ; FOR ASCII CODES 140-177

.MOSBM==:40  ;SET 128 CHARACTER BREAK MASK
.MORFW==:41  ;READ FIELD WIDTH
.MOSFW==:42  ;SET FIELD WIDTH

; NET MTOPR NUMBERS

.MOACP==:20  ;TOPS20AN ; ACCEPT CONNECTION ON SOCKET
.MOSND==:21  ;TOPS20AN ; SEND ALL CURRENTLY BUFFERED BYTES
.MOSIN==:22  ;TOPS20AN ; SEND INS/INR COMMAND
.MOAIN==:24  ;TOPS20AN ; ASSIGN INS/INR AND FSM PSI CHANNELS
.MO%IN==:77B5  ;TOPS20AN ; INS/INR SOFTWARE INTERRUPT CHANNEL
.MO%FSM==:77B17  ;TOPS20AN ; FSM CHANGE OF STATE INTERRUPT CHANNEL

; DEFINITIONS FOR DECNET

.MOACN==:24  ;ASSIGN CONNECT INTERRUPT CHANNEL
.MO%CDN==:777B8  ;CONNECT INTERRUPT CHANNEL
.MO%INA==:777B17  ;INTERRUPT MESSAGE CHANNEL
.MO%DAV==:777B26  ;DATA AVAILABLE CHANNEL
.MO%CI==:777  ;NO CHANGE
.MOCIA==:776  ;CLEAR INTERRUPT ASSIGNMENT

.MORLS==:25  ;READ LINK STATUS
.MO%CON==:1B0  ;LINK IS CONNECTED
.MO%SRV==:1B1  ;LINK IS A SERVER
.MO%WFC==:1B2  ;WAITING FOR A CONNECT
.MO%WCC==:1B3  ;WAITING FOR THIS LINK TO CONFIRM
.MO%EOM==:1B4  ;EOM PRESENT IN INPUT BUFFER
.MO%ABT==:1B5  ;CONNECTION ABORTED
.MO%SYN==:1B6  ;SYNCH DI RECIEVED
MONSYM.MAC

; DEFINITIONS FOR ATS

; FUNCTION CODES FOR MTOPR ARE IN COLUMN 1

; SET MODE WORD
; MESSAGE MODE
; DATA MODE
; ACQUIRE TERMINAL
; ENABLE INTERRUPTS
; FUNCTION TO BE PERFORMED
; ASSIGN INTERRUPT CHANNEL
; DEASSIGN INTERRUPT CHANNEL
; EVENT BEING ASSIGNED OR DEASSIGNED
; DATA ARRIVAL
; CHANNEL NUMBER
; GET STATUS
; WHICH DEVICES TO REPORT ON
; ALL TERMINALS
; TERMINALS WHOSE STATUS HAS CHANGED
; TERMINALS SPECIFIED IN LIST
; ASK THE RESOURCE MANAGER
; MORE DATA AVAILABLE FOR THIS JFN
; DEASSIGN TERMINAL
; DON'T SEND REMAINING DATA

A-40
;MUTIL JSYS FUNCTION CODES

;ENABLE PID FOR RECEIVING
.MUENB==:1
;DISABLE PID FROM RECEIVING
.MUDIS==:2
;GET PID OF [SYSTEM]INFO
.MUGETI==:3
;CREATE A PRIVATE INFO FOR A JOB
.MUCPI==:4
;DELETE A PID
.MUDES==:5
;CREATE A PID
.MUCRE==:6
;SET SEND AND RECEIVE QUOTAS
.MUSSO==:7
;CHANGE OWNER OF A PID
.MUCHO==:10
;FIND OWNER'S JOB NUMBER
.MUFJO==:11
;FIND JOB'S PIDS
.MUFJP==:12
;FIND SEND AND RECEIVE QUOTAS
.MUSFSQ==:13
;FIND FORK'S PIDS
.MUFFP==:15
;SET PID QUOTA
.MUFPQ==:16
;FIND PID QUOTA
.MUQRY==:20
;QUERY
.MUAPF==:21
;ASSOCIATE A PID WITH A FORK
.MUPIC==:22
;PUT PID ON AN INTERRUPT CHANNEL
.MUDFI==:23
;DEFINE PID OF [SYSTEM]INFO
.MUSSP==:24
;SET SYSTEM PID TABLE
.MUSPS==:25
;READ SYSTEM PID TABLE
.MUSKP==:26
;SET PID TO RECEIVE KILLED PID MESSAGE
.MURKP==:30
;READ PID THAT RECEIVES KILLED PID MESSAGES

;SYSTEM PID TABLE INDEX VALUES

;PID OF IPCC
.SPIPC==:0
;PID OF INFO
.SPINF==:1
;PID OF QUASAR
.SPQSR==:2
;PID OF QSRMDA
.SPMDA==:3
;PID OF OPERATOR JOB (ORION)
.SPOPQR==:4

;SET LOCAL NODE NAME
.NDGLN==:1
;GET LOCAL NODE NAME
.NDGLN==:1
;POINTER TO NODE NAME
.NDNSN==:2
;GET LOCAL NODE NUMBER
.NDNSN==:2
;SET LOCAL NODE NUMBER
.NDNSN==:2
;SET LOOPBACK ON PORT
.NDPRT==:0
;PORT TO SET IN LOOPBACK
.NDCLP==:5
;CLEAR LOOPBACK ON PORT
.NDLPF==:6
;FIND LOOPBACK PORT
.NDLPF==:6
;LOOPBACK RUNNING
.NDLPF==:6
;LOOPBACK ASSIGNED TO PORT
.NDLPF==:6

;OUTPUT MAGNITUDE
.NO%MAG==:1B0
;OUTPUT SIGN
.NO%SGN==:1B1
;LEADING FILLER
.NO%LFL==:1B2
;FILL WITH ZERO'S
.NO%ZRO==:1B3
;OUTPUT ON COLUMN OVERFLOW
.NO%OOCV==:1B4
;OUTPUT ASTERISKS ON OVERFLOW
.NO%AST==:1B5
;NUMBER OF COLUMNS TO USE
.NO%COL==:177B17
;RADIX
.NO%RDX==:777777

A-41
;ODCNV -- SEE IDCNV FOR BITS

;ODTMI

OT%NDAY==:1B0 ;DO NOT OUTPUT DATE
OT%DAY==:1B1 ;OUTPUT DAY OF WEEK
OT%FDY==:1B2 ;OUTPUT NUMERIC MONTH
OT%FMN==:1B3 ;OUTPUT NUMERIC MONTH
OT%MNN==:1B4 ;OUTPUT MONTH IN FULL
OT%4YR==:1B5 ;OUTPUT 4-DIGIT YEAR
OT%DAY==:1B6 ;OUTPUT DAY AFTER MONTH
OT%SPA==:1B7 ;OUTPUT SPACES IN DATE
OT%SLA==:1B8 ;OUTPUT SLASHES IN DATE
OT%NTM==:1B9 ;DO NOT OUTPUT TIME
OT%NSC==:1B10 ;DO NOT OUTPUT SECONDS
OT%12H==:1B11 ;OUTPUT 12-HOUR FORMAT
OT%CO==:1B12 ;DO NOT OUTPUT COLON
OT%TMZ==:1B13 ;OUTPUT TIME ZONE
OT%SLA==:1B17 ;SUPPRESS COLUMNIZATION

;ODTNC -- SEE IDCNV FOR BITS

;OPENF

OF%BSZ==:77B5 ;BYTE SIZE
OF%MOD==:17B9 ;MODE
OF%HER==:1B18 ;HALT ON IO ERROR
OF%RD==:1B19 ;READ
OF%WR==:1B20 ;WRITE
OF%EX==:1B21 ;EXECUTE (RESERVED FOR THE FUTURE)
OF%APP==:1B22 ;APPEND
OF%THW==:1B25 ;THAWED
OF%AWT==:1B26 ;ALWAYS WAIT
OF%PDT==:1B27 ;PREERVE DATES
OF%NWT==:1B28 ;NEVER WAIT
OF%RD==:1B29 ;RESTRICTED
OF%PLN==:1B30 ;SET TO DISABLE LINE NUMBER CHECKING FOR
OF%DUD==:1B31 ;DON'T UPDATE TO DISK BY DDMP
OF%OFL==:1B32 ;ALLOW OPENING THE DEVICE EVEN IF OFFLINE
; PMAP BIT DEFINITIONS
PM%CNT==:1B0 ; RH WORD CONTAINS A COUNT
PM%MVP==:1B1 ; MOVE PAGE INSTEAD OF INDIRECT POINTER
PM%RD==:1B2 ; (NOT IMPLEMENTED
PM%WT==:1B3 ; READ
PM%WR==:1B3 ; WRITE
PM%EX==:1B4 ; (ANOTHER NAME FOR ABOVE)
PM%RWX==:7B4 ; EXECUTE (RESERVED FOR THE FUTURE)
PM%PLD==:1B5 ; CONVENIENT ABBREV FOR RD+WT+EX
PM%IND==:1B5 ; PRELOAD PAGES BEING MAPPED
PM%TPU==:1B6 ; USE INDIRECT PTRS (RESERVED FOR THE FUTURE)
PM%RNX==:1B7 ; TRAP TO USER
PM%PLD==:1B5 ; (NOT IMPLEMENTED -- OBSOLETE)
PM%CPY==:1B9 ; COPY ON WRITE
PM%RPT==:777777B35 ; REPEAT COUNT

; PMCTL - PHYSICAL MEMORY CONTROL
.MCRCE==:0 ; READ CACHE ENABLE
.MCSCE==:1 ; SET CACHE ENABLE
.MCCST==:0 ; ARGLIST OFFSET FOR CACHE STATE
.MCPSEN==:1 ; CACHE ENABLE
.MCPS==:2 ; READ PAGE STATUS
.MCPS==:3 ; SET PAGE STATUS
.MCPSN==:0 ; ARGLIST OFFSET FOR PHYSICAL PAGE NUMBER
.MCPST==:1 ; ARGLIST OFFSET FOR PAGE STATE
.MCPST==:1 ; PAGE AVAILABLE
.MCPSS==:1 ; PAGE IN TRANSITION STATE
.MCPSS==:2 ; PAGE OFFLINE
.MCPSE==:3 ; PAGE OFFLINE DUE TO ERROR
.MCRME==:4 ; READ MEMORY ERROR INFORMATION
.PMMER==:1 ; MOS MEMORY ERROR
.PMMIP==:0 ; ENTRY HEADER AND TYPE
.PMMRG==:1 ; ERROR REGISTER
.PMMSY==:2 ; SYNDROME
.PMMSN==:3 ; BLOCK NUMBER
.PMSSN==:4 ; SPARE BIT NUMBER
.PMSE==:5 ; ERROR ADDRESS
.PMNSN==:6 ; START OF SERIAL NUMBERS
.PMSN==:4 ; # OF SERIAL NUMBERS TO STORE

; PRARG - PROCESS ARGUMENTS

; FUNCTION CODE DEFINITIONS
.PRARD==:1 ; READ ARGUMENT BLOCK
.PRAST==:2 ; SET ARGUMENT BLOCK
;RCUSR AND RCDIR

; FLAGS SUPPLIED ON CALL

RC%PAR==:1B14 ;PARTIAL RECOGNITION IS ALLOWED
RC%STP==:1B15 ;STEP WILDCARD (RCDIR ONLY)
RC&WAL==:1B16 ;ALLOW WILDCARDS (RCDIR ONLY)
RC%EMO==:1B17 ;EXACT MATCH ONLY

; FLAGS RETURNED

RC%DIR==1B0 ;FILES-ONLY DIRECTORY
RC%ANA==1B1 ;ALPHANUMERIC ACCOUNTS ALLOWED
RC%RLM==1B2 ;REPEAT LOGIN MESSAGE
RC%NOM==:1B3 ;NO MATCH FOUND
RC%AMB==:1B4 ;AMBIGUOUS
RC%NMD==:1B5 ;NO MORE DIRS - RETURNED IF STP IS REQUESTED
RC%WLD==:1B6 ;WILDCARD DIR WAS INPUT

;RDTTY AND TEXTI

RD%BRK==:1B0 ;BREAK ON REGULAR BREAK SET
RD%TOP==:1B1 ;BREAK ON TOPS10 BREAK SET
RD%PUN==:1B2 ;BREAK ON PUNCTUATION
RD%BEL==:1B3 ;BREAK ON END OF LINE
RD%CRF==:1B4 ;SUPPRESS CR (RETURNS LF ONLY)
RD%RND==:1B5 ;RETURN IF NOTHING TO DELETE
RD%JFN==:1B6 ;JFNS GIVEN FOR SOURCE
RD%RIE==:1B7 ;RETURN ON INPUT (BUFFER) EMPTY
RD%BBG==:1B8 ;BEGINNING OF (DEST) BUFFER GIVEN
RD%RF==:1B9 ;"R BUFFER IS DISJOINT
RD%RAI==:1B10 ;RAISE LOWERCASE INPUT
RD%SU==:1B11 ;SUPPRESS `U INDICATION
RD%BTM==:1B12 ;BREAK CHARACTER TERMINATED INPUT
RD%BE==:1B13 ;RETURNED BECAUSE BUFFER EMPTY
RD%BLR==:1B14 ;BACKUP LIMIT REACHED

;TEXTI ARG BLOCK

.RDCWB==:0 ;COUNT OF WORDS IN BLOCK
.RDFLG==:1 ;FLAGS
.RIDOJ==:2 ;IO JFNS
.RDDBP==:3 ;DEST BYTE POINTER
.RDBC==:4 ;DEST BYTE COUNT
.RDBFP==:5 ;TOP OF BUFFER POINTER
.RDRTY==:6 ;RETYPE ("R) POINTER
.RDBRK==:7 ;BREAK SET MASK POINTER
.RDBKL==:10 ;BACKUP LIMIT POINTER
;RFSTS
RF%LNG==:1B0 ;LONG FORM OF RFSTS CALL, ARG BLOCK IN 2
RF%PRH==:777777B35 ;PROCESS HANDLE

;RFSTS ARG BLOCK
.RFCNT==:0 ;XWD COUNT OF WORDS RETURNED,
.RFPSW==:1 ;MAXIMUM WORDS TO RETURN
.RFPFL==:2 ;PROCESS STATUS WORD
.RFPFC==:3 ;PROCESS' PC
.RFSFL==:4 ;PROCESS' PC FLAGS
.RF%EXO==:1B0 ;STATUS FLAGS FOR PROCESS:
.RF%EXO==:1B0 ;PROCESS IS EXECUTE-ONLY

;PROCESS STATUS WORD
RF%FRZ==:1B0 ;PROCESS IS FROZEN
RF%STS==:377777B17 ;PROCESS STATUS CODE
.RFUN==:0 ;RUNNABLE
.RFIO==:1 ;DISMISSED FOR I/O
.RFLHT==:2 ;HALTED
.RFPPT==:3 ;FORCED PROCESS TERMINATION
.RFWAT==:4 ;WAITING FOR INFERIOR PROCESS
.RFSLP==:5 ;SLEEP
.RPTRP==:6 ;JSYS TRAPPED
.RFPAK==:7 ;ADDRESS BREAK FREEZE
.RF%SIC==:777777B35 ;SOFTWARE INTERRUPT CHANNEL

;RFTAD/SFTAD
.RSWRT==:0 ;WRITE DATE WORD
.RSCRV==:1 ;CREATION DATE WORD
.RSREF==:2 ;REFERENCE DATE WORD
.RSCRE==:3 ;INTERNAL SYSTEM WRITE DATE WORD

;RMAP
RM%RD==:1B2 ;READ ACCESS ALLOWED
RM%WR==:1B3 ;WRITE ACCESS ALLOWED
RM%EX==:1B4 ;EXECUTE ACCESS ALLOWED
RM%PEX==:1B5 ;PAGE EXISTS
RM%CPY==:1B9 ;COPY ON WRITE

;RPACS/SPACS BIT DEFINITIONS
PA%RD==:1B2 ;READ ACCESS ALLOWED
PA%WT==:1B3 ;WRITE ACCESS ALLOWED
PA%WR==:1B3 ;(ANOTHER NAME FOR ABOVE)
PA%EX==:1B4 ;EXECUTE ACCESS ALLOWED
PA%PEX==:1B5 ;PAGE EXISTS
PA%IND==:1B6 ;INDIRECT POINTER
PA%TPU==:1B8 ;TRAP TO USER
PA%CPY==:1B9 ;COPY ON WRITE
PA%PRV==:1B10 ;PRIVATE
PL%RD==:1B20 ;READ ACCESS ALLOWED IN 1ST POINTER
PL%WR==:1B21 ;WRITE ACCESS ALLOWED IN 1ST POINTER
PL%WT==:1B21 ;(ANOTHER NAME FOR ABOVE)
Monsym.mac

P1%EX==:1B22 ; EXECUTE ACCESS ALLOWED IN 1ST POINTER
P1%PEX==:1B23 ; (RESERVED FOR THE FUTURE)
P1%CPY==:1B27 ; PAGE EXISTS IN 1ST POINTER
 ; COPY-ON-WRITE IN 1ST POINTER

; RScan
RSINI==:0 ; MAKE RESCAN BUFFER AVAILABLE FOR INPUT
RSCNT==:1 ; COUNT CHARACTERS LEFT TO READ FROM RESCAN BUFFER

; RTIW
RT%DIM==:1B0 ; DEFERRED TERMINAL INTERRUPT MASK GIVEN
RT%PRH==:37777B35 ; PROCESS HANDLE

; SCTTY
SCRET==:0 ; RETURN DESIGNATOR (CTTY) FOR FORK
SCSET==:1 ; SET SCTTY FOR FORK
SCRST==:2 ; CLEAR FORK CTTY (RESTORE JOB CTTY)

; SCV EC
SVEAD==:0 ; ENTRY ADDRESS
SVINE==:1 ; INITIAL ENTRY FOR SETUP
SVGET==:2 ; ENTRY ADDRESS FOR GET SHARE FILE ROUTINE
SV40==:3 ; ADDRESS TO GET LOCATION 40
SVRPC==:4 ; ADDRESS TO GET RETURN PC
SVMAK==:5 ; ENTRY FOR MAKE SHARE FILE ROUTINE
SV CST==:6 ; 2 WORD BLOCK FOR CONTROL-C/START PROCESSING

; SDVEC
SDEAD==:0 ; ENTRY ADDRESS
SDINE==:1 ; INITIAL ENTRY
SDVER==:2 ; DMS VERSION
SDDMS==:3 ; ADDRESS TO STORE DMS JSYS
SDFRC==:4 ; ADDRESS TO STORE RETURN PC
;SETJB FUNCTION CODES

;SET DEFAULT MAGTAPE DENSITY
.SJDEN==:0
;SYSTEM DEFAULT DENSITY
.SJDDN==:0
;200 BPI
.SJDN2==:1
;556 BPI
.SJDN5==:2
;800 BPI
.SJDN8==:3
;1600 BPI
.SJDN16==:4
;6250 BPI
.SJDN62==:5

;SET DEFAULT MAGTAPE PARITY
.SJPAR==:1
;ODD PARITY
.SJPRE==:1
;EVEN PARITY

;SET DEFAULT MAGTAPE DATA MODE
.SJDDM==:2
;SYSTEM DEFAULT DATA MODE
.SJDM==:0
;CORE DUMP MODE
.SJDMC==:1
;SIX BIT BYTE MODE (FOR 7-TRACK DRIVES)
.SJDM6==:2
;ANSI ASCII MODE (7 BITS IN 8 BIT BYTE)
.SJDM8==:3
;INDUSTRY COMPATIBLE MODE
.SJDMH==:4
;HI-DENSITY MODE (9 EIGHT BIT
;BYTES IN 2 WORDS)
.SJDM16==:5

;SET DEFAULT MAGTAPE RECORD SIZE
.SJR==:3
;SET DEFERRED SPOOLING
.SJDFS==:4
;IMMEDIATE MODE SPOOLING
.SJSPI==:0
;DEFERRED MODE SPOOLING
.SJSPD==:1
;SET JOB SESSION REMARK
.SJSRM==:5

;SET AUTHOR STRING
.SFAUT==:0
;SET LAST WRITER STRING
.SFLWR==:1
;SMON FUNCTION CODES AND BIT DEFINITIONS (SYSTEM FLAGS)

.SFAC==:O ;ALLOW FACT ENTRIES
.SFCDE==:1 ;CHECKDISK FOUND ERRORS
.SFCNR==:2 ;CHECKDISK RUNNING
.SPMST==:3 ;MANUAL START IN PROGRESS
.SFRMT==:4 ;REMOTE LOGINS ALLOWED
.SFPTY==:5 ;PTY LOGINS ALLOWED
.SFCCTY==:6 ;CTY LOGIN ALLOWED
.SFOPR==:7 ;OPERATOR IN ATTENDANCE
.SFLCL==:10 ;LOCAL LOGINS ALLOWED
.SFBTE==:11 ;BIT TABLE ERRORS FOUND ON STARTUP
.SFCRD==:12 ;USER CAN CHANGE DIRECTORY CHARACTERISTICS
.SFNVT==:13 ;TOPS20AN ;NVT LOGIN ALLOWED
.SFWCT==:14 ;WHEEL LOGIN ON CTY ALLOWED
.SFWLC==:15 ;WHEEL LOGIN ON LOCAL TERMINALS ALLOWED
.SFWRM==:16 ;WHEEL LOGIN ON REMOTE TERMINALS ALLOWED
.SFWPT==:17 ;WHEEL LOGIN ON PTY'S ALLOWED
.SFWNV==:17 ;WHEEL LOGIN ON NVT'S ALLOWED
.SFWUSG==:21 ;USAGE FILE IN USE
.SFUSG==:22 ;FULL LATENCY OPTIMIZATION
.SFFLO==:22 ;CAUTION: SETTING THIS REQUIRES THAT THE SYSTEM BE AT REVISION LEVEL 10, AND THAT RH20 BOARD M8555 BE AT REVISION LEVEL D. OTHERWISE, THE FILE-SYSTEM MAY BE DAMAGED.

;BELOW ARE FUNCTION CODES WHICH DO NOT MAP DIRECTLY INTO BITS

.SFTM==:44 ;TOPS20AN ;NETWORK ON/OFF CONTROL
.SFNTR==:45 ;TOPS20AN ;NET DOWN/UP REQUEST
.SFNTI==:46 ;TOPS20AN ;NET HOST TABLE INITIALIZE
.SFTMZ==:47 ;TOPS20AN ;SET TIME ZONE THIS SYSTEM IS IN
.SFLHN==:50 ;TOPS20AN ;SET LOCAL HOST NUMBER OF THIS NET SITE
.SSFR==:51 ;ACCOUNT VALIDATION ON/OFF
.SSFST==:52 ;ENABLE/DISABLE STATUS REPORTING
.SFBTE==:1B<.SFFAC> ;FACT ENTRIES ALLOWED
.SFCDE==:1B<.SFACDE> ;CHECKDISK FOUND ERRORS
.SFCNR==:1B<.SFCDE> ;CHECKDISK RUNNING
.SPMST==:1B<.SFCDR> ;MANUAL START IN PROGRESS
.SFRMT==:1B<.SFRMT> ;REMOTE LOGINS ALLOWED
.SFPTY==:1B<.SFPTY> ;PTY LOGINS ALLOWED
.SFCCTY==:1B<.SFCCTY> ;CTY LOGIN ALLOWED
.SFOPR==:1B<.SFOPR> ;OPERATOR IN ATTENDANCE
.SFUSG==:1B<.SFLCL> ;LOCAL LOGINS ALLOWED
.SFBTE==:1B<.SFBTE> ;BIT TABLE ERRORS FOUND ON STARTUP
.SFUSG==:1B<.SFFLO> ;USER CAN CHANGE DIRECTORY CHARACTERISTICS
.SFNVT==:1B<.SFCRD> ;NVT LOGINS ALLOWED
.SFUSG==:1B<.SFUSG> ;USAGE FILE IN USE
.SFFLO==:1B<.SFFLO> ;FULL LATENCY OPTIMIZATION IN USE
.SFTM==:1B<.SFFAC> ;CAUTION: SETTING THIS REQUIRES THAT THE SYSTEM BE AT REVISION LEVEL 10, AND THAT RH20 BOARD M8555 BE AT REVISION LEVEL D. OTHERWISE, THE FILE-SYSTEM MAY BE DAMAGED.

;SINM JSYS DEFINITIONS

.SITM==:1B0 ;TRUNCATE MESSAGE
.SI%EOM==:1B1 ;END-OF-MESSAGE FOUND
;SNOOP JSYS DEFINITIONS

;SNOOP FUNCTION CODES

.SNPLC==:0  ;LOCK CODE INTO MONITOR VIRT MEMORY
.SNPLS==:1  ;LOCK DOWN THE SWAPPABLE MONITOR
.SNPD==:2   ;DEFINE A BREAK POINT
.SNPBL==:3   ;INSERT THE BREAK POINTS
.SNPRB==:4   ;REMOVE THE BREAK POINTS
.SNPU==:5    ;UNLOCK AND RELEASE ALL SNOOP RESOURCES
.SNPSY==:6   ;LOOK UP A MONITOR SYMBOL
.SNPAD==:7   ;LOOK UP ADDRESS IN SYMBOL TABLE

;SOUTM JSYS DEFINITIONS

SO%WMG==:1B0  ;WRITE END-OF-MESSAGE

;SPOOL JSYS DEFINITION CODES

.SPLDI==:0    ;DEFINE AN INPUT SPOOLING DEVICE
.SPLSD==:1    ;SET DIRECTORY OF SPOOLED DEVICE
.SPLDR==:2    ;READ DIRECTORY OF SPOOLED DEVICE

;FLAGS IN SPOOL MESSAGE ON LOGOUT AND SPOOLED FILE CLOSE

SP%BAT==:1B0  ;JOB IS A BATCH JOB
SP%DFS==:1B1  ;SPOOLING IS DEFERRED
SP%ELO==:1B2  ;JOB EXECUTED LOGOUT JSYS ITSELF
SP%FLO==:1B3  ;JOB FORCED TO LOG OUT BY TRAP IN TOP FK
SP%LO==:1B4   ;OTHER JOB AIMED LOGOUT AT THIS ONE

;SPOOL ARGUMENT BLOCK

.SPLDV==:0    ;DEVICE DESIGNATOR
.SPLNA==:1    ;NAME STRING
.SPLDNR==:1   ;DIRECTORY NUMBER
.SPLGN==:2    ;GENERATION NUMBER

;SSAVE

SS%NNP==:777777B17  ;NEGATIVE NUMBER OF PAGES
SS%PPY==:1B18     ;ALLOW COPY-ON-WRITE
SS%UCA==:1B19     ;USE CURRENT ACCESS
SS%RD==:1B20      ;ALLOW READ ACCESS
SS%WR==:1B21      ;ALLOW WRITE ACCESS
SS%EXE==:1B22     ;ALLOW EXECUTE ACCESS
SS%FPN==:777B35    ;FIRST PAGE NUMBER

;STCMP

SC%LSS==:1B0    ;T1 LESS THAN T2
SC%SUB==:1B1    ;T1 SUBSTRING OF T2
SC%GT==:1B2     ;T1 GREATER THAN T2

A-49
;STDIR
ST%DIR==:lBO
ST%ANA==:lB1
ST%RLM==:lB2

;STIW
ST%DIM==:lBO
ST%PRH==:777777B35

;SWTRP DEFINITIONS
.SWART==:0
.SWRAT==:1
.SWLUT==:2
.SWRLT==:3
.ARPFL==:0
.AROP==:1
.ARNPC==:2

;TBLUK
TL%NOM==:lBO
TL%AMB==:lB1
TL%ABR==:lB2
TL%EXM==:lB3

;TFORK
;FUNCTION CODES IN LH ACl
.TFSET==:0
.TFRAL==:1
.TFRTP==:2
.TFRPS==:3
.TFTST==:5
.TFRES==:6
.TFRUU==:9

;TIMER DEFINITIONS
.TIMRT==:0
.TIMEL==:1
.TIMDT==:2
.TIMDD==:3
.TIMBF==:4
.TIMAL==:5
;TLINK
TL%COR==:1B0  ;CLEAR REMOTE TO OBJECT LINK
TL%COR==:1B1  ;CLEAR OBJECT TO REMOTE LINK
TL%COR==:1B2  ;ESTABLISH OBJECT TO REMOTE LINK
TL%ER==:1B3   ;ESTABLISH REMOTE TO OBJECT LINK
TL%SAB==:1B4  ;SET ACCEPT BIT FOR OBJECT
TL%ABS==:1B5   ;ACCEPT BIT STATE
TL%STA==:1B6  ;SET OR CLEAR ADVICE
TL%AAD==1B7   ;ACCEPT ADVICE
TL%OBJ==:77777B35  ;OBJECT DESIGNATOR

;UTEST FUNCTION CODES
.USET==:0  ;START TESTING
.UTCLR==:1  ;STOP TESTING AND RETURN RESULTS

;UTEST ARGUMENT BLOCK
.UTADR==:0  ;STARTING ADDRESS OF CODE
.UTLEN==:1  ;LENGTH OF CODE
.UTMAP==:2  ;START OF BIT MAP

;USAGE
.USSENT==:0  ;WRITE ENTRY
.USCLS==:1   ;CLOSE OUT CURRENT FILE
.USCKP==:2   ;PERFORM CHECKPOINT
.USLGI==:3  ;LOGIN
.USLGO==:4  ;LOGOUT
.USSEN==:5  ;SESSION END
.USCKI==:6  ;SET CHECKPOINT INTERVAL
.USENA==:7  ;ENABLE ACCOUNT VALIDATION
.USCAS==:10  ;CHANGE ACCOUNTING SHIFT NOW
.USSAS==:11  ;SET AUTOMATIC ACCOUNTING SHIFT CHANGE TIMES
.USRAS==:12  ;READ AUTOMATIC ACCOUNTING SHIFT CHANGE TIMES
.US%DOW==:177B6  ;DAY-OF-WEEK BITS
.US%SSM==:777777  ;TIME IN SECONDS SINCE MIDNIGHT

;UFRK
.UTTRP==:1B0  ;ITRAP (OR DO ERJMP/ERCAL) TRAPPED JSYS
;SCHEDULER CONTROL FLAGS (JSYS NOT YET DEFINED)

SK%CYT==:1B18 ; CYCLE TIME
SK%IOC==:1B19 ; IO QUANTUM CHARGE
SK%HTF==:3B21 ; BALSET HOLD TIME
SK%HQR==:1B22 ; HIGH QUEUE RESERVE
SK%LQR==:1B23 ; LOW QUEUE RESERVE
SK%BQE==:1B24 ; BALSET QUEUE ON ENTRY
SK%BQR==:1B25 ; BALSET QUEUE ON REQUEUE
SK%RQ1==:1B26 ; REQUEUE TO QUEUE 1
SK%TTP==:1B27 ; TTY PREFERENCE
SK%WCF==:1B28 ; WAIT CREDIT PROPORTIONAL TO LOAD AV
;GENERAL FIELD AND VALUE DEFINITIONS
;USED BY MANY JSYSES

;GENERAL FORK HANDLES

.FHSLF==:<Z -1> ;SELF
.FHSUP==:<Z -2> ;SUPERIOR
.FHTOP==:<Z -3> ;TOP IN JOB
.FHSAI==:<Z -4> ;SELF AND INFERIORS
.FHINF==:<Z -5> ;INFERIORS
.FHJOB==:<Z -5> ;ALL IN JOB

;FIELDS OF JFN MODE WORD

TT%OSP==:1B0 ;OUTPUT SUPPRESS
TT%MFF==:1B1 ;MECHANICAL FORMFEED PRESENT
TT%TAB==:1B2 ;MECHANICAL TAB PRESENT
TT%LCA==:1B3 ;LOWER CASE CAPABILITIES PRESENT
TT%LEN==:17B10 ;PAGE LENGTH
TT%WID==:17B17 ;PAGE WIDTH
TT%WAK==:17B23 ;WAKEUP FIELD
TT%WKO==:1B18 ;WAKEUP CLASS 0 (UNUSED)
TT%IGN==:1B19 ;IGNORE TT%WAK ON SFMOD
TT%WKF==:1B20 ;WAKEUP ON FORMATING CONTROL CHARS
TT%WKN==:1B21 ;WAKEUP ON NON-FORMATTEING CONTROLS
TT%WKP==:1B22 ;WAKEUP ON PUNCTUATION
TT%WKA==:1B23 ;WAKEUP ON ALPHANUMERIC
TT%ECO==:1B24 ;ECHOS ON
TT%ECM==:1B25 ;ECHO MODE
TT%ALK==:1B26 ;ALLOW LINKS
TT%AAD==:1B27 ;ALLOW ADVICE (NOT IMPLEMENTED)
TT%DAM==:1B29 ;DATA MODE
.TT%BIN==:0 ;BINARY
.TT%ASC==:1 ;ASCII
.TT%ATO==:2 ;ASCII AND TRANSLATE OUTPUT ONLY
.TT%ATE==:3 ;ASCII AND TRANSLATE ECHOS ONLY
TT%UOC==:1B30 ;UPPER CASE OUTPUT CONTROL
TT%LIC==:1B31 ;LOWER CASE INPUT CONTROL
TT%DUM==:1B33 ;DUPLEX MODE
.TT%PDX==:0 ;FULL DUPLEX
.TT%DX==:1 ;NOT USED, RESERVED
.TT%DUX==:2 ;HALF DUPLEX (CHARACTER)
.TT%LUX==:3 ;LINE HALF DUPLEX
TT%PGM==:1B34 ;PAGE MODE
TT%CAR==:1B35 ;CARRIER STATE
;DIRECTORY PROTECTION DEFINITIONS (3 6-BIT FIELDS: OWNER, GROUP, WORLD)

DP%RD==:40 ;READING DIRECTORY IS ALLOWED
DP%CN==:10 ;CONNECT TO DIR, OR CHANGE PROT/ACCOUNT
DP%CF==:4  ;CREATING FILES IN DIR IS ALLOWED

;FILE PROTECTION DEFINITIONS (3 6-BIT FIELDS: OWNER, GROUP, WORLD)

FP%DIR==:2 ;DIRECTORY LISTING
FP%APP==:4 ;APPEND
FP%EX==:10 ;EXECUTE
FP%WR==:20 ;WRITE
FP%RD==:40 ;READ

;INPUT AND OUTPUT IDENTIFIERS

.PRIN==:100 ;PRIMARY INPUT
.PRIOU==:101 ;PRIMARY OUTPUT
.NULIO==:377777 ;NULL DESIGNATOR
.CTRRM==:777777 ;JOB'S CONTROLLING TERMINAL
.DVDES==:600000 ;UNIVERSAL DEVICE CODE
.TTDES==:400000 ;UNIVERSAL TERMINAL CODE

;MAGTAPE DEVICE STATUS BITS

.MT%ILW==:LB18 ;ILLEGAL WRITE
.MT%DVE==:LB19 ;DEVICE ERROR
.MT%DAE==:LB20 ;DATA ERROR
.MT%SER==:LB21 ;SUPPRESS ERROR RECOVERY PROCEDURES
.MT%EOP==:LB22 ;EOF (FILE MARK)
.MT%IRL==:LB23 ;INCORRECT RECORD LENGTH
.MT%BOT==:LB24 ;BEGINNING OF TAPE
.MT%EOT==:LB25 ;END OF TAPE
.MT%DEN==:LB26 ;EVEN PARITY
.MT%DEN==:3B28 ;DENSITY (0 IS 'NORMAL')
.MTLOD==:1 ;LOW DENSITY (200 BPI)
.MTMD==:2 ;MEDIUM DENSITY (556 BPI)
.MTHID==:3 ;HIGH DENSITY (800 BPI)
.MT%CCT==:7B31 ;CHARACTER COUNTER

;DEVICE DATA MODES

.DMASC==:1 ;ASCII
.DMIMG==:10 ;IMAGE
.DMINB==:13 ;IMAGE BINARY
.DMBIN==:14 ;BINARY
; DEFINED PSI CHANNELS

RADIX 5+5

; ARITHMETIC OVERFLOW
.ICAOV==:6

; FLOATING OVERFLOW
.ICFOV==:7

; PDL OVERFLOW
.ICPOV==:9

; END OF FILE
.ICEOF==:10

; DATA ERROR
.ICDAE==:11

; QUOTA/DISK EXCEEDED
.ICQTA==:12

; TIME OF DAY (NOT IMPLEMENTED)
.ICTOD==:14

; ILLEGAL INSTRUCTION
.ICILI==:15

; ILLEGAL READ
.ICIIRD==:16

; ILLEGAL WRITE
.ICIWR==:17

; ILLEGAL EXECUTE (NOT IMPLEMENTED)
.ICIEX==:18

; INFERIOR FORK TERMINATION
.ICIFT==:19

; MACHINE SIZE EXCEEDED
.ICMSE==:20

; TRAP TO USER (NOT IMPLEMENTED)
.ICTRU==:21

; NONEXISTENT PAGE REFERENCED
.ICNXP==:22
;TERMINAL TYPE NUMBERS

.TT33==:0 ;MODEL 33
.TT35==:1 ;MODEL 35
.TT37==:2 ;MODEL 37
.TTEXE==:3 ;EXECUPORT
.TTDEF==:"D8 ;DEFAULT
.TTIDL==:"D9 ;IDEAL
.TTV05==:"D10 ;VT05
.TTV50==:"D11 ;VT50
.TTL30==:"D12 ;LA30
.TTG40==:"D13 ;GT40
.TTL36==:"D14 ;LA36
.TTV52==:"D15 ;VT52

;DEFINED TERMINAL CODES

.TICBK==:0 ;BREAK
.TICCA==:1 ;^A
.TICCB==:2 ;^B
.TICCC==:3 ;^C
.TICCD==:4 ;^D
.TICCE==:5 ;^E
.TICCF==:6 ;^F
.TICCG==:7 ;^G
.TICCH==:8 ;^H
.TICCI==:9 ;^I
.TICCJ==:10 ;^J
.TICCK==:11 ;^K
.TICCL==:12 ;^L
.TICCM==:13 ;^M
.TICCN==:14 ;^N
.TICCO==:15 ;^O
.TICCP==:16 ;^P
.TICCQ==:17 ;^Q
.TICCR==:18 ;^R
.TICCS==:19 ;^S
.TICCt==:20 ;^T
.TICCu==:21 ;^U
.TICCV==:22 ;^V
.TICCw==:23 ;^W
.TICCx==:24 ;^X
.TICCy==:25 ;^Y
.TICCz==:26 ;^Z
.TICES==:27 ;ESC
.TICRb==:28 ;RUBOUT
.TICSp==:29 ;SPACE
.TICRF==:30 ;CARRIER OFF
.TICTI==:31 ;TYPEIN
.TICTO==:32 ;TYPEOUT
RADIX 8

;CAPABILITIES

SC%CTC==:1B0 ;CONTROL-C
SC%GTB==:1B1 ;GETAB
SC%MNN==:1B2 ;MAP MONITOR
SC%LOG==:1B3 ;LOGGING FUNCTIONS
SC%MPP==:1B4 ;MAP PRIVILEGED PAGES
SC%SDV==:1B5 ;SPECIAL DEVICES
SC%SCT==:1B6 ;ASSIGN TTY AS CONTROLLING FOR FORK (SCTTY)
SC%SUP==:1B9 ;SUPERIOR ACCESS
SC%FRZ==:1B17 ;FREEZE ON TERMINATING CONDITIONS
SC%WHL==:1B18 ;WHEEL
SC%OPR==:1B19 ;OPERATOR
SC%CNF==:1B20 ;CONFIDENTIAL INFORMATION ACCESS
SC%MNT==:1B21 ;MAINTENANCE
SC%IPC==:1B22 ;IPCF PRIVILEGES
SC%ENQ==:1B23 ;ENQ/DEQ PRIVILEGES
SC%NWZ==:1B24 ;TOPS20AN ;NET WIZARD PRIVILEGES (ASNSQ, ETC.)
SC%NAS==:1B25 ;TOPS20AN ;NETWORK ABSOLUTE SOCKET PRIVILEGE

;OUTMODED NAMES FOR BITS IN DIRECTORY MODE WORD – USE CD%XXX
;EQUIVALENTS

MD%FO==:CD%DIR ;FILES ONLY DIRECTORY
MD%SA==:CD%ANA ;STRING ACCOUNT ALLOWED
MD%RLM==:CD%RLM ;REPEAT LOGIN MESSAGE

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; FDB DEFINITIONS

FB%TMP==:1B0 ; FILE IS TEMPORARY
FB%PRM==:1B1 ; FILE IS PERMANENT
FB%NEX==:1B2 ; FILE DOES NOT HAVE AN EXTENSION YET
FB%DEL==:1B3 ; FILE IS DELETED
FB%NXF==:1B4 ; FILE IS NONEXISTENT
FB%SHT==:1B5 ; FILE HAS COMPRESSED PAGE TABLE
FB%DIR==:1B6 ; FILE IS A DIRECTORY FILE
FB%NOD==:1B7 ; FILE IS NOT TO BE DUMPED BY BACKUP SYSTEM
FB%BAT==:1B8 ; FILE HAS AT LEAST ONE BAD PAGE IN IT
FB%SRD==:1B9 ; THIS DIRECTORY HAS SUBDIRECTORIES
FB%FCF==:17B17
.FBFRM==:O
.FBFRMS==:l
.FBHDR==:O
.FBCTL==:l
.FBEXL==:2
.FBADR==:3
.FBPRT==:4
.FBCRE==:5
.FBUSE==:6
.FBAUTH==:6
.FBGEN==:7
.FB%GEN==:777777B17
.FBDNR==:7
.FB%DRN==:777777
.FBACCT==:10
.FBBYV==:11
.FBBAY==:77B5
.FBBASE==:77B11
.FB%MID==:17B17
.FB%PGC==:777777
.FBSIZ==:12
.FBCRV==:13
.FBPRT==:14
.FBREF==:15
.FBCNT==:16
.FBBK0==:17
.FBBK1==:20
.FBBK2==:21
.FBBK3==:22
.FBBK4==:23
.FBUSEW==:24
.FBGNL==:25
.FBNAM==:26
.FBEXT==:27
.FBLWR==:30
.FBLEN==:31

; HEADER WORD
; FLAGS
; LINK TO FDB OF NEXT EXTENSION
; PROTECTION OF THE FILE
; TIME AND DATE OF LAST WRITE
; LAST WRITER;, AUTHOR (OBS)
; GENERATION;, DIR #
; GENERATION NUMBER
; GENERATION;, DIR #
; DIR NUMBER
; ACCOUNT
; RETENTION+BYTE SIZE+MODE;, # OF PAGES
; RETENTION COUNT
; BYTE SIZE
; LAST OPENF MODE
; EOF POINTER
; TIME AND DATE OF CREATION OF FILE
; TIME AND DATE OF LAST USER WRITE
; TIME AND DATE OF LAST NON-WRITE ACCESS
; # OF WRITES;, # OF REFERENCES
; BACKUP WORDS (5)

; USER SETTABLE WORD
; LINK TO NEXT GENERATION FILE
; POINTER TO NAME BLOCK
; POINTER TO EXTENSION BLOCK
; POINTER TO LAST WRITER STRING

; LENGTH OF VERSION 0 FDB
; LENGTH OF VERSION 1 FDB
; LENGTH OF THE FDB
; CARD READER DEFINITIONS

.CRILC="\" ; ILLEGAL CHARACTER CODE

; A WORD IS DISTINGUISHED FROM A BYTE POINTER BY THE VALUE 5 IN BITS 0-2
; USE THESE DEFINITIONS TO TEST FOR A NUMBER AS FOLLOWS:
; LOAD AC,NMFLG,LOC
; CAIE AC,NUMVAL

NMFLG=:7B2
NUMVAL=:5

; DEFINITIONS FOR COMMUNICATIONS PROTOCOLS

; DEFINE THE SUPPORTED PROTOCOL TYPES

.VN20F=:0 ; RSX20F PROTOCOL
.VNMCB=:1 ; MCB DECNET PROTOCOL
.VNDDC=:2 ; DDCMP PROTOCOL
.VNMOP=:3 ; MOP (DDCMP MAINTENANCE) MODE
.VNCNL=:4 ; CONTROLLER LOOPBACK
.VNCBL=:5 ; CABLE LOOPBACK

; DEFINE BITS USED WHEN RELOADING AN -11

RM%ROM=:1B0 ; IF SET, ACTIVATE ROM
;*******************************************************
;GENERAL FIELD AND VALUE DEFINITIONS
;USED BY TOPS20AN JSYS'S
;*******************************************************

;STATES OF A CONNECTION IN ARPANET NCP
; RETURNED IN B0-B3 OF GDSTS ON A NET CONNECTION
; ALSO AVAILABLE IN A GETAB, BUT THAT'S NOT THE PREFERRED WAY
; TO READ THEM, IF YOU HAVE A JFN FOR THE CONNECTION.

.NSCZD==:01 ;CLOSED
.NSPND==:02 ;PENDING
.NSLSN==:03 ;LISTENING
.NSRCR==:04 ;REQUEST FOR CONNECTION RECEIVED
.NSCW1==:05 ;CLOSE WAIT SUB ONE (NCP CLOSE)
.NSRCS==:06 ;REQUEST FOR CONNECTION SENT
.NSOPN==:07 ;OPENED
.NSCSW==:10 ;CLOSE WAIT (NCP CLOSE)
.NSDTW==:11 ;FINAL DATA WAIT
.NSRF1==:12 ;RFNM WAIT SUB ONE (NORMAL NCP CLOSE)
.NSCZW==:13 ;CLOSE WAIT (PROGRAM CLOSE)
.NSRF2==:14 ;RFNM WAIT SUB TWO (UNEXPECTED NCP CLOSE)
.NSFRE==:16 ;FREE
;ERROR CODE DEFINITIONS

;BASE VALUE FOR ALL ERROR CODES

DEFINE .ERCOD <

.ERR (10,LGINX1, <Invalid account identifier>)
.ERR (11,LGINX2, <Directory is "files-only" and cannot be logged in to>)
.ERR (12,LGINX3, <Internal format of directory is incorrect>)
.ERR (13,LGINX4, <Invalid password>)
.ERR (14,LGINX5, <Job is already logged in>)
.ERR (20,CRBXX1, <Invalid parameter or function bit combination>)
.ERR (21,CRBXX2, <Illegal for created job to enter MINI-EXEC>)
.ERR (22,CRBXX3, <Reserved>)
.ERR (23,CRBXX4, <Terminal is not available>)
.ERR (24,CRBXX5, <Unknown name for LOGIN>)
.ERR (25,CRBXX6, <Insufficient system resources>)
.ERR (26,CRBXX7, <Reserved>)
.ERR (35,LOUTX1, <Illegal to specify job number when logging out own job>)
.ERR (36,LOUTX2, <Invalid job number>)
.ERR (45,CACTX1, <Invalid account identifier>)
.ERR (46,CACTX2, <Job is not logged in>)
.ERR (51,EPCTX2, <Entry cannot be longer than 64 words>)
.ERR (52,EPCTX3, <Fatal error when accessing PACT file>)
.ERR (55,GJFX1, <Desired JFN invalid>)
.ERR (56,GJFX2, <Desired JFN not available>)
.ERR (57,GJFX3, <No JFN available>)
.ERR (60,GJFX4, <Invalid character in filename>)
.ERR (61,GJFX5, <Field cannot be longer than 39 characters>)
.ERR (62,GJFX6, <Device field not in a valid position>)
.ERR (63,GJFX7, <Directory field not in a valid position>)
.ERR (64,GJFX8, <Terminal terminating delimiter is not preceded by a valid beginning delimiter>)
.ERR (65,GJFX9, <More than one name field is not allowed>)
.ERR (66,GJFX10, <Generation number is not numeric>)
.ERR (67,GJFX11, <More than one generation number field is not allowed>)
.ERR (70,GJFX12, <More than one account field is not allowed>)
.ERR (71,GJFX13, <More than one protection field is not allowed>)
.ERR (72,GJFX14, <Invalid protection>)
.ERR (73,GJFX15, <Invalid confirmation character>)
.ERR (74,GJFX16, <No such device>)
.ERR (75,GJFX17, <No such directory name>)
.ERR (76,GJFX18, <No such filename>)
.ERR (77,GJFX19, <No such file type>)
.ERR (100,GJFX20, <No such generation number>)
.ERR (101,GJFX21, <File was expunged>)
.ERR (102,GJFX22, <Insufficient system resources (Job Storage Block full)>)
.ERR (103,GJFX23, <Directory full>)
.ERR (104,GJFX24, <File not found>)
.ERR (107,GJFX27, <File already exists (new file required)>)
.ERR (110,GJFX28, <Device is not on line>)
.ERR (111,GJFX29, <Device is not available to this job>)
.ERR (112,GJFX30, <Account is not numeric>)
.ERR (113,GJFX31, <Invalid wildcard designator>)
.ERR (114,GJFX32, <No files match this specification>)
.ERR (115,GJFX33, <Filename was not specified>)
.ERR (116,GJFX34, <Invalid character "?" in file specification>)
.ERR (117,GJFX35, <Directory access privileges required>)
.ERR (120,OPNX1, <File is already open>)
.ERR (121,OPNX2, <File does not exist>)
.ERR (122,OPNX3, <Read access required>)
.ERR (123,OPNX4, <Write access required>)
.ERR (124,OPNX5, <Execute access required>)}
.ERR (125,OPNX6,<Append access required>)
.ERR (126,OPNX7,<Device already assigned to another job>)
.ERR (127,OPNX8,<Device is not on line>)
.ERR (130,OPNX9,<Invalid simultaneous access>)
.ERR (131,OPNX10,<Entire file structure full>)
.ERR (133,OPNX12,<List access required>)
.ERR (134,OPNX13,<Invalid access requested>)
.ERR (136,OPNX14,<Invalid mode requested>)
.ERR (136,OPNX15,<Read/write access required>)
.ERR (137,OPNX16,<File has bad index block>)
.ERR (140,OPNX17,<No room in job for long file page table>)
.ERR (141,OPNX18,<Unit Record Devices are not available>)
.ERR (142,OPNX19,<IMP is not up>) ;TOPS20AN
.ERR (143,OPNX20,<Host is not up>) ;TOPS20AN
.ERR (144,OPNX21,<Connection refused>) ;TOPS20AN
.ERR (145,OPNX22,<Connection byte size does not match>) ;TOPS20AN
.ERR (150,DESX1,<Invalid source/destination designator>)
.ERR (151,DESX2,<Terminal is not available to this job>)
.ERR (152,DESX3,<JFN is not assigned>)
.ERR (153,DESX4,<Invalid use of terminal designator or string pointer>)
.ERR (154,DESX5,<File is not open>)
.ERR (155,DESX6,<Device is not a terminal>)
.ERR (156,DESX7,<JFN cannot refer to output wildcard designators>)
.ERR (157,DESX8,<File is not on disk>)
.ERR (160,CLSX1,<File is not open>)
.ERR (161,CLSX2,<File cannot be closed by this process>)
.ERR (165,RJFNX1,<File is not closed>)
.ERR (166,RJFNX2,<JFN is being used to accumulate filename>)
.ERR (167,RJFNX3,<JFN is not accessible by this process>)
.ERR (170,DELPX1,<Delete access required>)
.ERR (175,SPPTX1,<File is not open>)
.ERR (176,SPPTX2,<Illegal to reset pointer for this file>)
.ERR (177,SPPTX3,<Invalid byte number>)
.ERR (200,CNDIX1,<Invalid password>)
.ERR (202,CNDIX3,<Invalid directory number>)
.ERR (204,CNDIX5,<Job is not logged in>)
.ERR (210,SPBSX1,<Illegal to change byte size for this opening of file>)
.ERR (211,SPBSX2,<Invalid byte size>)
.ERR (215,IOX1,<File is not opened for reading>)
.ERR (216,IOX2,<File is not opened for writing>)
.ERR (217,IOX3,<File is not open for random access>)
.ERR (220,IOX4,<End of file reached>)
.ERR (221,IOX5,<Device or data error>)
.ERR (222,IOX6,<Illegal to write beyond absolute end of file>)
.ERR (240,PMAPX1,<Invalid access requested>)
.ERR (241,PMAPX2,<Invalid use of PMAP>)
.ERR (245,SPACX1,<Invalid access requested>)
.ERR (250,FRKHX1,<Invalid process handle>)
.ERR (251,FRKHX2,<Illegal to manipulate a superior process>)
.ERR (252,FRKHX3,<Invalid use of multiple process handle>)
.ERR (253,FRKHX4,<Process is running>)
.ERR (255,FRKHX6,<All relative process handles in use>)
.ERR (260,SLPX1,<Process is not inferior or equal to self>)
.ERR (261,SLPX2,<Process is not inferior to self>)
.ERR (262,SLPX3,<New superior process is inferior to intended inferior>)
.ERR (267,GTABX1,<Invalid table number>)
.ERR (270,GTABX2,<Invalid table index>)
.ERR (271,GTABX3,<GETAB capability required>)
.ERR (273,RENX1,<Invalid process handle -3 or -4>)
.ERR (275,STADX1,<WHEEL or OPERATOR capability required>)
.ERR (276,STADX2,<Invalid date or time>)
.ERR (300,ASNDX1,<Device is not assignable>)
.ERR (301,ASNDX2,<Illegal to assign this device >)
.ERR (302,ASNDX3,<No such device>)
.ERR (320, ATACX1, <Invalid job number>)
.ERR (321, ATACX2, <Job already attached>)
.ERR (322, ATACX3, <Incorrect user number>)
.ERR (323, ATACX4, <Invalid password>)
.ERR (324, ATACX5, <This job has no controlling terminal>)
.ERR (325, STDVX1, <No such device>)
.ERR (332, STDVX2, <Device designator>)
.ERR (335, DEFX1, <Invalid device designator>)
.ERR (336, DEFX2, <Device already assigned to another job>)
.ERR (337, DEFX3, <Device is not on line>)
.ERR (345, MNTX1, <Internal format of directory is incorrect>)
.ERR (346, MNTX2, <Device is not on line>)
.ERR (347, MNTX3, <Device is not mountable>)
.ERR (350, TERMX1, <Invalid terminal code>)
.ERR (351, TLNX1, <Illegal to set remote to object before object to remote>)
.ERR (352, ATIX1, <Invalid software interrupt channel number>)
.ERR (353, ATIX2, <Control-C capability required>)
.ERR (356, TLNX2, <Link was not received within 15 seconds>)
.ERR (357, TLNX3, <Links full>)
.ERR (360, TTYX1, <Device is not a terminal>)
.ERR (361, RSCNX1, <Overflown rescan buffer, input string truncated>)
.ERR (362, RSCNX2, <Invalid function code>)
.ERR (363, CFRKX1, <Insufficient system resources>)
.ERR (365, KFRX1, <Illegal to kill top level process>)
.ERR (366, KFRX2, <Illegal to kill self>)
.ERR (367, FRKX1, <Processes are not frozen>)
.ERR (370, HFRX1, <Illegal to halt self with HFORK>)
.ERR (371, GFRKX1, <Invalid process handle>)
.ERR (373, GETX1, <Invalid save file format>)
.ERR (374, GETX2, <System Special Pages Table full>)
.ERR (375, TFRKX1, <Undefined function code>)
.ERR (376, TFRKX2, <Unassigned fork handle or not immediate inferior>)
.ERR (377, SFRVX1, <Invalid position in entry vector>)
.ERR (407, NOUTX1, <Radix is not in range 2 to 36>)
.ERR (410, NOUTX2, <Column overflow>)
.ERR (411, TFRKX3, <Fork(s) not frozen>)
.ERR (414, IFIXX1, <Radix is not in range 2 to 10>)
.ERR (415, IFIXX2, <First non-space character is not a digit>)
.ERR (416, IFIXX3, <Overflow (number is greater than 2**35)>)
.ERR (424, GFDBX1, <Invalid displacement>)
.ERR (425, GFDBX2, <Invalid number of words>)
.ERR (426, GFDBX3, <List access required>)
.ERR (430, CFDBX1, <Invalid displacement>)
.ERR (431, CFDBX2, <Illegal to change specified bits>)
.ERR (432, CFDBX3, <Write or owner access required>)
.ERR (433, CFDBX4, <Invalid value for specified bits>)
.ERR (440, DUMPX1, <Command list error>)
.ERR (441, DUMPX2, <JFN is not open in dump mode>)
.ERR (442, DUMPX3, <Address error (too big or crosses end of memory)>)
.ERR (443, DUMPX4, <Access error (cannot read or write data in memory)>)
.ERR (450, RNAMX1, <Files are not on same device>)
.ERR (451, RNAMX2, <Destination file expunged>)
.ERR (452, RNAMX3, <Write or owner access to destination file required>)
.ERR (453, RNAMX4, <Quota exceeded in destination of rename>)
.ERR (454, BKJFX1, <Illegal to back up terminal pointer twice>)
.ERR (460, TIMEX1, <Time cannot be greater than 24 hours>)
.ERR (461, ZONE1, <Time zone out of range>)
.ERR (462, ODNTX1, <Time zone must be USA or Greenwich>)
.ERR (464, DILFX1, <Invalid date format>)
.ERR (465, TLFX1, <Invalid time format>)
.ERR (466, DATEX1, <Year out of range>)
.ERR (467, DATEX2, <Month is not less than 12>)
.ERR (468, DATEX3, <Day of month too large>)
.ERR (471, DATEX4, <Day of week is not less than 7>)
.ERR (472, DATEX5, <Date out of range>)

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ERR (473,DATEX6, <System date and time are not set>)
ERR (516, SMONX1, <WHEEL or OPERATOR capability required>)
ERR (530, SACTX1, <File is not on multiple-directory device>)
ERR (531, SACTX2, <Insufficient system resources (Job Storage Block full)>)
ERR (532, SACTX3, <Directory requires numeric account>)
ERR (533, SACTX4, <Write or owner access required>)
ERR (540, GACTX1, <File is not on multiple-directory device>)
ERR (541, GACTX2, <File expunged>)
ERR (544, FFUFX1, <File is not open>)
ERR (545, FFUFX2, <File is not on multiple-directory device>)
ERR (546, FFUFX3, <No used page found>)
ERR (555, DSMX1, <File(s) not closed>)
ERR (560, RDDIX1, <Illegal to read directory for this device>)
ERR (570, SIRX1, <Table address is not greater than 20>)
ERR (600, SAVX1, <Illegal to save files on this device>)
ERR (601, SAVX2, <Page count is not less than or equal to 1000>)
ERR (610, SEVEX1, <Entry vector is not less than 1000>)
ERR (614, WHELX1, <WHEEL or OPERATOR capability required>)
ERR (615, CAPX1, <WHEEL or OPERATOR capability required>)
ERR (617, PEEX2, <Read access failure on monitor page>)
ERR (620, CRDIX1, <WHEEL or OPERATOR capability required>)
ERR (621, CRDIX2, <Illegal to change number of old directory>)
ERR (622, CRDIX3, <Insufficient system resources (Job Storage Block full)>)
ERR (624, CRDIX5, <Directory name not given>)
ERR (626, CRDIX7, <File(s) open in directory>)
ERR (640, GTDIX1, <WHEEL or OPERATOR capability required>)
ERR (641, GTDIX2, <Invalid directory number>)
ERR (650, FLNX1, <First character is not blank or numeric>)
ERR (651, FLNX2, <Number too small>)
ERR (652, FLNX3, <Number too large>)
ERR (653, FLNX4, <Invalid format>)
ERR (660, FLOTX1, <Column overflow in field 1 or 2>)
ERR (661, FLOTX2, <Column overflow in field 3>)
ERR (662, FLOTX3, <Invalid format specified>)
ERR (670, HPTX1, <Undefined clock number>)
ERR (700, FDFRX1, <Not a multiple-directory device>)
ERR (701, FDFRX2, <Invalid directory number>)
ERR (710, ATNX1, <Invalid receive JFN>)
ERR (711, ATNX2, <Receive JFN not opened for read>)
ERR (712, ATNX3, <Receive JFN not open>)
ERR (713, ATNX4, <Receive JFN is not a NET connection>)
ERR (714, ATNX5, <Receive JFN has been used>)
ERR (715, ATNX6, <Receive connection refused>)
ERR (716, ATNX7, <Invalid send JFN>)
ERR (717, ATNX8, <Send JFN not opened for write>)
ERR (720, ATNX9, <Send JFN not open>)
ERR (721, ATNX10, <Send JFN is not a NET connection>)
ERR (722, ATNX11, <Send JFN has been used>)
ERR (723, ATNX12, <Send connection refused>)
ERR (724, ATNX13, <Insufficient system resources (No NVT's)>)
ERR (727, CVHST1, <No string for that Host number>)
ERR (730, CVSKX1, <Invalid JFN>)
ERR (731, CVSKX2, <Local socket invalid in this context>)
ERR (732, SNDIX1, <Invalid message size>)
ERR (733, SNDIX2, <Insufficient system resources (No buffers available)>)
ERR (734, SNDIX3, <Illegal to specify NCP links 0 - 72>)
ERR (735, SNDIX4, <Invalid header value for this queue>)
ERR (736, SNDIX5, <IMP down>)
ERR (737, NTWZX1, <NET WIZARD capability required>)
ERR (740, ASNSX1, <Insufficient system resources (All special queues in use)>)
ERR (741, ASNSX2, <Link(s) assigned to another special queue>)
ERR (742, SQX1, <Special network queue handle out of range>)
ERR (743, SQX2, <Special network queue not assigned>)

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.ERR (750,RNAMX5,\textless Destination file is not closed\textgreater )
.ERR (751,RNAMX6,\textless Destination file has bad page table\textgreater )
.ERR (752,RNAMX7,\textless Source file expired\textgreater )
.ERR (753,RNAMX8,\textless Write or owner access to source file required\textgreater )
.ERR (754,RNAMX9,\textless Source file is nonexistent\textgreater )
.ERR (755,RNMX10,\textless Source file is not closed\textgreater )
.ERR (756,RNMX11,\textless Source file has bad page table\textgreater )
.ERR (757,RNMX12,\textless Illegal to rename to self\textgreater )
.ERR (760,GJFX36,\textless Internal format of directory is incorrect\textgreater )
.ERR (770,ILINS1,\textless Undefined operation code\textgreater )
.ERR (771,ILINS2,\textless Undefined JSYS\textgreater )
.ERR (772,ILINS3,\textless UUO simulation facility not available\textgreater )
.ERR (1000,CRNX1,\textless Logical name is not defined\textgreater )
.ERR (1001,INLNX1,\textless Index is beyond end of logical name table\textgreater )
.ERR (1002,LNSTX1,\textless No such logical name\textgreater )
.ERR (1003,MLKBX1,\textless Lock facility already in use\textgreater )
.ERR (1004,MLKBX2,\textless Too many pages to be locked\textgreater )
.ERR (1005,MLKBX3,\textless Page is not available\textgreater )
.ERR (1006,MLKBX4,\textless Illegal to remove previous contents of user map\textgreater )
.ERR (1007,VBCX1,\textless Display data area not locked in core\textgreater )
.ERR (1010,RDTX1,\textless Invalid string pointer\textgreater )
.ERR (1011,GFFSX1,\textless Area too small to hold process structure\textgreater )
.ERR (1013,GTJX1,\textless Invalid index\textgreater )
.ERR (1014,GTJX2,\textless Invalid terminal line number\textgreater )
.ERR (1015,GTJX3,\textless Invalid job number\textgreater )
.ERR (1016,IPCFX1,\textless Length of packet descriptor block cannot be less than 4\textgreater )
.ERR (1017,IPCFX2,\textless No message for this PID\textgreater )
.ERR (1020,IPCFX3,\textless Data too long for user's buffer\textgreater )
.ERR (1021,IPCFX4,\textless Receiver's PID invalid\textgreater )
.ERR (1022,IPCFX5,\textless Receiver's PID disabled\textgreater )
.ERR (1023,IPCFX6,\textless Send quota exceeded\textgreater )
.ERR (1024,IPCFX7,\textless Receiver quota exceeded\textgreater )
.ERR (1025,IPCFX8,\textless IPCF free space exhausted\textgreater )
.ERR (1026,IPCFX9,\textless Sender's PID invalid\textgreater )
.ERR (1027,IPCF10,\textless WHEEL capability required\textgreater )
.ERR (1030,IPCF11,\textless WHEEL or IPCF capability required\textgreater )
.ERR (1031,IPCF12,\textless No free PID's available\textgreater )
.ERR (1032,IPCF13,\textless PID quota exceeded\textgreater )
.ERR (1033,IPCF14,\textless No PID's available to this job\textgreater )
.ERR (1034,IPCF15,\textless No PID's available to this process\textgreater )
.ERR (1035,IPCF16,\textless Receive and message data modes do not match\textgreater )
.ERR (1036,IPCF17,\textless Argument block too small\textgreater )
.ERR (1037,IPCF18,\textless Invalid MUTIL JSYS function\textgreater )
.ERR (1040,IPCF19,\textless No PID for [SYSTEM] INFO\textgreater )
.ERR (1041,IPCF20,\textless Invalid process handle\textgreater )
.ERR (1042,IPCF21,\textless Invalid job number\textgreater )
.ERR (1043,IPCF22,\textless Invalid software interrupt channel number\textgreater )
.ERR (1044,IPCF23,\textless [SYSTEM] INFO already exists\textgreater )
.ERR (1045,IPCF24,\textless Invalid message size\textgreater )
.ERR (1046,IPCF25,\textless PID does not belong to this job\textgreater )
.ERR (1047,IPCF26,\textless PID does not belong to this process\textgreater )
.ERR (1050,IPCF27,\textless PID is not defined\textgreater )
.ERR (1051,IPCF28,\textless PID not accessible by this process\textgreater )
.ERR (1052,IPCF29,\textless PID already being used by another process\textgreater )
.ERR (1053,IPCF30,\textless Job is not logged in\textgreater )
.ERR (1054,GJFX31,\textless No more files in this specification\textgreater )
.ERR (1055,ENQX1,\textless Invalid function\textgreater )
.ERR (1056,ENQX2,\textless Level number too small\textgreater )
.ERR (1057,ENQX3,\textless Request and lock level numbers do not match\textgreater )
.ERR (1060,ENQX4,\textless Number of pool and lock resources do not match\textgreater )
.ERR (1061,ENQX5,\textless Lock already requested\textgreater )
.ERR (1062,ENQX6,\textless Requested locks are not all locked\textgreater )
.ERR (1063,ENQX7,\textless No ENQ on this lock\textgreater )
.ERR (1064,ENQX8,\textless Invalid access change requested\textgreater )
ERR (1065, ENQX9, <Invalid number of blocks specified>)
ERR (1066, ENQX10, <Invalid argument block length>)
ERR (1067, ENQX11, <Invalid software interrupt channel number>)
ERR (1070, ENQX12, <Invalid number of resources requested>)
ERR (1071, ENQX13, <Indirect or indexed byte pointer not allowed>)
ERR (1072, ENQX14, <Invalid byte size>)
ERR (1073, ENQX15, <ENO/DEQ capability required>)
ERR (1074, ENQX16, <WHEEL or OPERATOR capability required>)
ERR (1075, ENQX17, <Invalid JFN>)
ERR (1076, ENQX18, <Quota exceeded>)
ERR (1077, ENQX19, <String too long>)
ERR (1100, ENQX20, <Locked JFN cannot be closed>)
ERR (1101, ENQX21, <Job is not logged in>)
ERR (1102, IPCF31, <Invalid page number>)
ERR (1103, IPCF32, <Page is not private>)
ERR (1104, PMAPX3, <Illegal to move shared page into file>)
ERR (1105, PMAPX4, <Illegal to move file page into process>)
ERR (1106, PMAPX5, <Illegal to move special page into file>)
ERR (1107, PMAPX6, <Disk quota exceeded>)
ERR (1110, SNOPX1, <WHEEL or OPERATOR capability required>)
ERR (1111, SNOPX2, <Invalid function>)
ERR (1112, SNOPX3, <SNPLC function must be first>)
ERR (1113, SNOPX4, <Only one .SNPLC function allowed>)
ERR (1114, SNOPX5, <Invalid page number>)
ERR (1115, SNOPX6, <Invalid number of pages to lock>)
ERR (1116, SNOPX7, <Illegal to define breakpoints after inserting them>)
ERR (1117, SNOPX8, <Breakpoint is not set on instruction>)
ERR (1120, SNOPX9, <No more breakpoints allowed>)
ERR (1121, SNOP10, <Breakpoints already inserted>)
ERR (1122, SNOP11, <Breakpoints not inserted>)
ERR (1123, SNOP12, <Invalid format for program name symbol>)
ERR (1124, SNOP13, <No such program name symbol>)
ERR (1125, SNOP14, <No such symbol>)
ERR (1126, SNOP15, <Not enough free pages for snooping>)
ERR (1127, SNOP16, <Multiply defined symbol>)
ERR (1130, IPCF33, <Invalid index into system PID table>)
ERR (1131, SNOP17, <Breakpoint already defined>)
ERR (1132, OPNX23, <Disk quota exceeded>)
ERR (1133, GJFX37, <Input deleted>)
ERR (1134, CRLNX2, <WHEEL or OPERATOR capability required>)
ERR (1135, INLNX2, <Invalid function>)
ERR (1136, LNSTX2, <Invalid function>)
ERR (1137, ALCX1, <Invalid function>)
ERR (1140, ALCX2, <WHEEL or OPERATOR capability required>)
ERR (1141, ALCX3, <Device is not assignable>)
ERR (1142, ALCX4, <Invalid job number>)
ERR (1143, ALCX5, <Device already assigned to another job>)
ERR (1144, SPLX1, <Invalid function>)
ERR (1145, SPLX2, <Argument block too small>)
ERR (1146, SPLX3, <Invalid device designator>)
ERR (1147, SPLX4, <WHEEL or OPERATOR capability required>)
ERR (1150, SPLX5, <Illegal to specify 0 as generation number for first file>)
ERR (1151, CLSX3, <File still mapped>)
ERR (1152, CRLNX3, <Invalid function>)
ERR (1153, ALCX6, <Device assigned to user job, but will be given to allocator when released>)
ERR (1154, CAX1, <Argument block too small>)
ERR (1155, CAX2, <Invalid directory number>)
ERR (1156, CAX3, <Invalid access code>)
ERR (1157, TMX1, <Invalid function>)
ERR (1158, TMX2, <Invalid process handle>)
ERR (1161, TMX3, <Time limit already set>)
ERR (1162, TMX4, <Illegal to clear time limit>)
ERR (1163, SNOP18, <Data page is not private or copy-on-write>)
ERR (1164, GJFX38, <File not found because output-only device was specified>)
ERR (1165,GJFX39,<Logical name loop detected>)
ERR (1166,CRDIX8,<Invalid directory number>)
ERR (1167,CRDIX9,<Internal format of directory is incorrect>)
ERR (1170,CRDIX10,<Maximum directory number exceeded; index table needs expanding>)
ERR (1171,DELDXI,<WHEEL or OPERATOR capability required>)
ERR (1172,DELDX2,<Invalid directory number>)
ERR (1173,GACTX3,<Internal format of directory is incorrect>)
ERR (1174,DIAGX1,<Invalid function>)
ERR (1175,DIAGX2,<Device is not assigned>)
ERR (1176,DIAGX3,<Argument block too small>)
ERR (1177,DIAGX4,<Invalid device type>)
ERR (1200,DIAGX5,<WHEEL, OPERATOR, or MAINTENANCE capability required>)
ERR (1201,DIAGX6,<Invalid channel command list>)
ERR (1202,DIAGX7,<Illegal to do I/O across page boundary>)
ERR (1203,DIAGX8,<No such device>)
ERR (1204,DIAGX9,<Unit does not exist>)
ERR (1205,DIAG10,<Subunit does not exist>)
ERR (1206,SYEX1,<Unreasonable SYSERR block size>)
ERR (1207,SYEX2,<No buffer space available for SYSERR>)
ERR (1210,MTOXI,<Invalid function>)
ERR (1211,IOX7,<Insufficient system resources (Job Storage Block full)>)
ERR (1217,CLSX4,<Device still active>)
ERR (1218,MTOX2,<Record size was not set before I/O was done>)
ERR (1221,WOX3,<Function not legal in dump mode>)
ERR (1222,MTOX4,<Invalid record size>)
ERR (1223,MTOX6,<Invalid magnetic tape density>)
ERR (1224,OPNX25,<Device is write locked>)
ERR (1225,GJFX40,<Undefined attribute in file specification>)
ERR (1226,MTOX7,<WHEEL or OPERATOR capability required>)
ERR (1227,LOUTX3,<WHEEL or OPERATOR capability required>)
ERR (1230,LOUTX4,<LOG capability required>)
ERR (1231,CAPX2,<WHEEL, OPERATOR, or MAINTENANCE capability required>)
ERR (1232,SSAVX3,<Insufficient system resources (Job Storage Block full)>)
ERR (1233,SSAVX4,<Directory area of EXE file is more than one page>)
ERR (1234,TDEIX1,<Table is empty>)
ERR (1235,TADDX1,<Table is full>)
ERR (1236,TADDX2,<Entry is already in table>)
ERR (1240,IOX10,<Record is longer than user requested>)
ERR (1241,CONDX2,<WHEEL or OPERATOR capability required>)
ERR (1242,CONDX4,<Invalid job number>)
ERR (1243,CONDX6,<Job is not logged in>)
ERR (1244,SBX1,<Invalid function>)
ERR (1245,SBX2,<Invalid magnetic tape density>)
ERR (1246,SBX3,<Invalid magnetic tape data mode>)
ERR (1247,TMONX1,<Invalid TMON function>)
ERR (1250,SMONX2,<Invalid SMON function>)
ERR (1251,SBX4,<Invalid job number>)
ERR (1252,SBX5,<Job is not logged in>)
ERR (1253,SBX6,<WHEEL or OPERATOR capability required>)
ERR (1254,GTJX4,<No such job>)
ERR (1255,ILINS4,<UUO simulation is disabled>)
ERR (1256,ILINS5,<RMS facility is not available>)
ERR (1257,COMMX1,<Invalid COMND function code>)
ERR (1260,COMMX2,<Field too long for internal buffer>)
ERR (1261,COMMX3,<Command too long for internal buffer>)
ERR (1262,COMMX4,<Invalid character in input>)
ERR (1263,PRAX1,<Invalid PRARG function code>)
ERR (1264,PRAX2,<No room in monitor data base for argument block>)
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.ERR (1265,COMNX5,<Invalid string pointer argument>)
.ERR (1266,COMNX6,<Problem in indirect file>)
.ERR (1267,COMNX7,<Error in command>)
.ERR (1270,PRAX3,<PRARG argument block too large>)
.ERR (1271,CKAX4,<File is not on disk>)
.ERR (1272,GACCX1,<Invalid job number>)
.ERR (1273,GACCX2,<No such job>)
.ERR (1274,MTOX8,<Argument block too long>)
.ERR (1275,DBRKX1,<No interrupts in progress>)
.ERR (1276,SPRX1,<Job is not logged in>)
.ERR (1277,GJFX41,<File name must not exceed 6 characters>)
.ERR (1300,GJFX42,<File type must not exceed 3 characters>)
.ERR (1301,GACX3,<Confidential Information Access capability required>)
.ERR (1302,TIMEX2,<Downtime cannot be more than 7 days in the future>)
.ERR (1303,DELFX2,<File cannot be expunged because it is currently open>)
.ERR (1304,DELFX3,<Directory symbol table could not be rebuilt>)
.ERR (1305,DELFX4,<Directory symbol table needs rebuilding>)
.ERR (1307,DELFX6,<Internal format of directory is incorrect>)
.ERR (1310,DELFX7,<PDB formatted incorrectly; file not deleted>)
.ERR (1311,DELFX8,<PDB not found; file not deleted>)
.ERR (1312,DELFX9,<Process page cannot exceed 777>)
.ERR (1313,DIRX1,<Invalid directory number>)
.ERR (1314,DIRX2,<Insufficient system resources>)
.ERR (1315,DIRX3,<Internal format of directory is incorrect>)
.ERR (1316,UFPGX1,<File is not open for write>)
.ERR (1317,LGFX1,<Page table does not exist and file not open for write>)
.ERR (1320,IPCF34,<Cannot receive into an existing page>)
.ERR (1321,COMNX8,<Number base out of range 2-10>)
.ERR (1322,MTOX9,<Output still pending>)
.ERR (1323,MTOX10,<VFU or RAM file cannot be OPENed>)
.ERR (1324,MTOX11,<Data too large for buffers>)
.ERR (1325,MTOX12,<Input error or not all data read>)
.ERR (1326,MTOX13,<Argument block too small>)
.ERR (1327,MTOX14,<Invalid software interrupt channel number>)
.ERR (1330,SAVX1,<Illegal to save files on this device>)
.ERR (1331,MTOX15,<Device does not have Direct Access (programmable) VFU>)
.ERR (1332,MTOX16,<VFU or Translation Ram file must be on disk>)
.ERR (1333,LFINX1,<Invalid unit number>)
.ERR (1334,LFINX2,<WHEEL or OPERATOR capability required>)
.ERR (1335,LFINX3,<Illegal to load RAM or VFU while device is OPEN>)
.ERR (1336,MTX17,<Device is not on line>)
.ERR (1337,LGFX6,<No more job slots available for logging-in>)
.ERR (1340,DESX9,<Invalid operation for this device>)
.ERR (1341,ACESX1,<Argument block too small>)
.ERR (1342,ACESX2,<Insufficient system resources>)
.ERR (1343,DSKOX1,<Channel number too large>)
.ERR (1344,DSKOX2,<Unit number too large>)
.ERR (1345,MRX1,<Invalid function>)
.ERR (1346,MRX2,<WHEEL or OPERATOR capability required>)
.ERR (1347,MRX3,<Argument block too small>)
.ERR (1350,MRX4,<Insufficient system resources>)
.ERR (1351,MRX5,<Drive is not on-line>)
.ERR (1352,MRX6,<Home blocks are bad>)
.ERR (1353,MRX7,<Invalid structure name>)
.ERR (1354,MRX8,<Could not get OPEN for ROOT-DIRECTORY>)
.ERR (1355,MRX9,<Could not MAP ROOT-DIRECTORY>)
.ERR (1356,MRX10,<ROOT-DIRECTORY bad>)
.ERR (1357,MRX11,<Could not initialize Index Table>)
.ERR (1360,MRX12,<Could not OPEN Bit Table File>)
.ERR (1361,MRX13,<Backup copy of ROOT-DIRECTORY is bad>)
.ERR (1362,MRX14,<Invalid channel number>)
.ERR (1363,MRX15,<Invalid unit number>)
.ERR (1364,MRX16,<Invalid controller number>)
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. ERR (1365, DSKX01, <Invalid structure number>)
. ERR (1366, DSKX02, <Bit table is being initialized>)
. ERR (1367, DSKX03, <Bit table has not been initialized>)
. ERR (1370, DSKX04, <Bit table being initialized by another job>)
. ERR (1371, GFUSX1, <Invalid function>)
. ERR (1372, GFUSX2, <Insufficient system resources>)
. ERR (1373, SFUSX1, <Invalid function>)
. ERR (1374, SFUSX2, <Insufficient system resources>)
. ERR (1375, SFUSX3, <No such user name>)
. ERR (1376, RCDIX1, <Insufficient system resources>)
. ERR (1377, RCDIX2, <Invalid directory specification>)
. ERR (1400, RCDIX3, <Invalid structure name>)
. ERR (1401, RCDIX4, <Monitor internal error>)
. ERR (1402, RCUSX1, <Insufficient system resources>)
. ERR (1403, TDELPX2, <Invalid table entry location>)
. ERR (1404, TIXM5, <Invalid software interrupt channel number>)
. ERR (1405, LSTRX1, <Process has not encountered any errors>)
. ERR (1406, SWJFX1, <Illegal to swap same JFN>)
. ERR (1407, MTOX18, <Invalid software interrupt channel number>)
. ERR (1410, OFNX26, <Illegal to open a string pointer>)
. ERR (1411, DELPX9, <File is not a directory file>)
. ERR (1412, CRDI6X6, <Directory file is mapped>)
. ERR (1413, COMNX9, <End of input file reached>)
. ERR (1414, STYPX1, <Invalid terminal type>)
. ERR (1415, PMAPX7, <Illegal to map file on dismounted structure>)
. ERR (1416, DSKO3X3, <Invalid structure number>)
. ERR (1417, DESX10, <Structure is dismounted>)
. ERR (1420, DSKO4X3, <Invalid address type specified>)
. ERR (1421, MSTRX17, <All units in a structure must be of the same type>)
. ERR (1422, MSTRX18, <No more units in system>)
. ERR (1423, MSTRX19, <Unit is already part of a mounted structure>)
. ERR (1424, MSTRX20, <Data error reading HOME blocks>)
. ERR (1425, MSTRX21, <Structure is not mounted>)
. ERR (1426, MSTRX22, <Illegal to change specified bits>)
. ERR (1427, CRDI11, <Invalid terminating bracket on directory>)
. ERR (1430, MSTRX23, <Could not write HOME blocks>)
. ERR (1431, ACESX3, <Password is required>)
. ERR (1432, ACESX4, <Function not allowed for another job>)
. ERR (1433, ACESX5, <No function specified for ACCESS>)
. ERR (1434, STRX05, <No such user name>)
. ERR (1435, ACESX6, <Directory is not accessed>)
. ERR (1436, STRX01, <Structure is not mounted>)
. ERR (1437, STRX02, <Insufficient system resources>)
. ERR (1440, IOX11, <Quota exceeded or disk full>)
. ERR (1441, IOX12, <Insufficient system resources (Swapping space full)>)
. ERR (1442, STRX03, <No such directory name>)
. ERR (1443, STRX04, <Ambiguous directory specification>)
. ERR (1444, PPNX1, <Invalid PPN>)
. ERR (1445, PPNX2, <Structure is not mounted>)
. ERR (1446, PPNX3, <Insufficient system resources>)
. ERR (1447, PPNX4, <Invalid directory number>)
. ERR (1450, SPLX6, <No directory to write spooled files into>)
. ERR (1451, CRD112, <Structure is not mounted>)
. ERR (1452, GFUSX3, <File expunged>)
. ERR (1453, GFUSX4, <Internal format of directory is incorrect>)
. ERR (1454, RNMX13, <Insufficient system resources>)
. ERR (1455, SJBX8, <Illegal to perform this function>)
. ERR (1456, DECRRV, <DEC reserved bits not zero>)

; ERROR CODES 1457-1534 ARE AVAILABLE******

. ERR (1535, TIMX6, <Time has already passed>)
. ERR (1536, TIMX7, <No space available for a clock>)
. ERR (1537, TIMX8, <User clock allocation exceeded>)

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; Error codes 1554-1677 are available ******

; Error codes 1540-1549

.ERR (1540,TIMX9,<No such clock entry found>)
.ERR (1541,TIMX10,<No system date and time>)

; Error codes 1550-1553

.ERR (1550,SCTX1,<Invalid function code>)
.ERR (1551,SCTX2,<Terminal already in use as controlling terminal>)
.ERR (1552,SCTX3,<Illegal to redefine the job's controlling terminal>)
.ERR (1553,SCTX4,<SC%SCT capability required>)

; Error codes 1554-1582

.ERR (1554,SFUSX4,<File expunged>)
.ERR (1555,SFUSX5,<Write or owner access required>)
.ERR (1556,SFUSX6,<No such user name>)
.ERR (1557,GETX3,<Illegal to overlay existing pages>)
.ERR (1558,FILX01,<File is not open>)
.ERR (1559,ARGX01,<Invalid password>)
.ERR (1560,ARGX3,<WHEEL capability required>)
.ERR (1561,ARGX4,<WHEEL or IPCF capability required>)
.ERR (1562,CAPX6,<ENQ/DEQ capability required>)
.ERR (1563,CAPX7,<Confidential Information Access Capability required>)
.ERR (1564,CAPX8,<Invalid function>)
.ERR (1565,CAPX9,<Illegal to change specified bits>)
.ERR (1566,CAPX10,<Invalid page number>)
.ERR (1567,CAPX11,<Invalid job number>)
.ERR (1568,CAPX12,<No such job>)
.ERR (1569,CAPX13,<Invalid byte size>)
.ERR (1570,CAPX14,<Illegal access requested>)
.ERR (1571,CAPX15,<Invalid directory number>)
.ERR (1572,CAPX16,<Invalid process handle>)
.ERR (1573,CAPX17,<Invalid software interrupt channel number>)
.ERR (1574,MONX01,<Insufficient system resources>)
.ERR (1575,MONX02,<Insufficient system resources (JSB full)>)
.ERR (1576,MONX03,<Monitor internal error>)
.ERR (1577,MONX04,<Insufficient system resources (Swapping space full)>)
.ERR (1578,MONX14,<Invalid account identifier>)
.ERR (1579,MONX15,<Job is not logged in>)
.ERR (1580,FILX02,<Write or owner access required>)
.ERR (1581,FILX03,<List access required>)
.ERR (1582,FILX04,<Device is not assignable>)
.ERR (1583,FILX05,<File is not on multiple-directory device>)
.ERR (1584,FILX06,<Password is required>)
.ERR (1585,FILX07,<Invalid argument block length>)
.ERR (1586,FILX08,<Invalid structure name>)
.ERR (1587,FILX09,<No such device>)
.ERR (1588,FILX10,<Invalid directory specification>)
.ERR (1589,FILX11,<File expunged>)
.ERR (1590,FILX12,<No such user number>)
.ERR (1591,MSTX24,<Illegal to dismount the Public Structure>)
.ERR (1592,MSTX25,<Invalid number of swapping pages>)
.ERR (1593,MSTX26,<Invalid number of Front-End-Filesystem pages>)
.ERR (1594,MSTX27,<Illegal to log out job 0>)
.ERR (1595,MSTX28,<More than one ;T specification is not allowed>)
.ERR (1596,MSTX29,<Invalid terminal line width>)
.ERR (1597,MSTX30,<Invalid terminal line length>)
.ERR (1598,MSTX31,<Specified unit is not a disk>)
.ERR (1599,MSTX32,<Could not initialize bit table for structure>)
.ERR (1600,MSTX33,<Could not reconstruct ROOT-DIRECTORY>)
.ERR (1601,DSDK05,<Disk assignments and deassignments are currently prohibited>)
.ERR (1602,DSDK06,<Invalid disk address>)
.ERR (1603,DSDK07,<Address cannot be deassigned because it is not assigned>)
.ERR (1604,DSDK08,<Address cannot be assigned because it is already assigned>)
.ERR (1605,DSDK09,<Invalid default string>)
ERR (1770,MSTX30,<Incorrect Bit Table counts on structure>)
ERR (1771,LOCKX1,<Illegal to lock other than a private page>)
ERR (1772,LOCKX2,<Requested page unavailable>)
ERR (1773,LOCKX3,<Attempt to lock too much memory>)
ERR (1774,ILLLX01,<Illegal memory read>)
ERR (1775,ILLLX02,<Illegal memory write>)
ERR (1776,ILLLX03,<Memory data parity error >)
ERR (1777,ILLLX04,<Reference to non-existent page>)
ERR (2000,MSTX31,<Structure already mounted>)
ERR (2001,MSTX32,<Structure was not mounted>)
ERR (2002,MSTX33,<Structure is unavailable for mounting>)
ERR (2003,STDIX1,<The STDIR JSYS has been replaced by RCDIR and RCUSR>)
ERR (2004,CNDIX7,<The CNDIR JSYS has been replaced by ACCES>)
ERR (2005,PMCLX1,<Illegal page state or state transition>)
ERR (2006,PMCLX2,<Requested physical page is unavailable>)
ERR (2007,PMCLX3,<Requested physical page contains errors>)
ERR (2010,DLFX10,<Cannot delete directory; file still mapped>)
ERR (2011,DLFX11,<Cannot delete directory file in this manner>)
ERR (2012,GJFX44,<Account string does not match>)
ERR (2013,UTSTX1,<Invalid function code>)
ERR (2014,UTSTX2,<Area of code too large to test>)
ERR (2015,UTSTX3,<UTEST facility in use by another process>)
ERR (2016,BOTX01,<Invalid DTE-20 number>)
ERR (2017,BOTX02,<Invalid byte size>)
ERR (2020,DCNX1,<Invalid network file name>)
ERR (2021,DCNX5,<No more logical links available>)
ERR (2022,DCNX3,<Invalid object>)
ERR (2023,DCNX4,<Invalid task name>)
ERR (2024,DCNX9,<Object is already defined>)
ERR (2025,DCNX8,<Invalid network operation>)
ERR (2026,DCNX11,<Link aborted>)
ERR (2027,DCNX12,<String exceeds 16 bytes>)
ERR (2030,TTYX01,<Line is not active>)
ERR (2031,BOTX03,<Invalid protocol version number>)
ERR (2032,MONX05,<Insufficient system resources (no resident free space)>)
ERR (2033,ARGX19,<Invalid unit number>)
ERR (2034,IOX69,<General temporary TAPE error code>)
ERR (2035,COMX11,<Invalid CMRTY pointer>)
ERR (2036,COMX12,<Invalid CMFP pointer>)
ERR (2037,COMX13,<Invalid CMPTR pointer>)
ERR (2040,COMX14,<Invalid CMABP pointer>)
ERR (2043,COMX15,<Invalid default string pointer>)
ERR (2042,COMX16,<Invalid help message pointer>)
ERR (2043,COMX17,<Invalid byte pointer in function block>)
ERR (2044,NPXAMB,<Ambiguous>)
ERR (2045,NPXNSW,<Not a switch - does not begin with slash>)
ERR (2046,NPXNOM,<Does not match switch or keyword>)
ERR (2047,NPXNUL,<Null switch or keyword given>)
ERR (2050,NPXINW,<Invalid guide word>)
ERR (2051,NPXNC,<Not confirmed>)
ERR (2052,NPXICN,<Invalid character in number>)
ERR (2053,NPXIDT,<Invalid device terminator>)
ERR (2054,NPXNQS,<Not a quoted string - does not begin with double quote>)
ERR (2055,NPXNMT,<Does not match token>)
ERR (2056,NPXNMD,<Does not match directory or user name>)
ERR (2057,NPXCMX,<Comma not given>)
ERR (2060,GJFX45,<Illegal to request multiple specifications for the same attribute>)
ERR (2061,GJFX46,<Attribute value is required>)
ERR (2062,GJFX47,<Attribute does not take a value>)
ERR (2063,MSTX34,<Unit is write-locked>)
ERR (2064,GJFX48,<GTJFN input buffer is empty>)
ERR (2065,GJFX49,<Invalid attribute for this device>)
ERR (2077,SJBX7,<Remark exceeds 39 characters>)
ERR (2100,DELF10,<Directory still contains subdirectory>)
.ERR (2203,DCNX14,<Previous interrupt message outstanding>)
.ERR (2204,DCNX15,<No interrupt message available>)
.ERR (2205,GJFX50,<Invalid argument for attribute>)
.ERR (2206,KDPX01,<KMCIII not running>)
.ERR (2207,NODX02,<Line not turned off>)
.ERR (2210,NODX03,<Another line already looped>)
.ERR (2211,GJFX51,<Byte count too small>)
.ERR (2212,COMX20,<Invalid node name>)
> ;END OF .ERCOD DEFINITION

;DEFINE THE ERROR CODE VALUES
DEFINE .ERR (N,E,S) <
    E=:.ERBAS+N
    IFG <N-.ERMAX>,<.ERMAX==:N>
    .ERMAX==:0

.ERCOD
;THIS SECTION CONSISTS OF SPECIAL CODE TO WRITE THE ERRMES.BIN FILE
;THE CODE IS ONLY ASSEMBLED IF .ERBLD IS PREVIOUSLY
;DEFINED TO BE NON-ZERO.

IFDEF .ERBLD,<.ERBLD==0>

IFN .ERBLD,<

.ERGO: MOVSI 1,(GJ%FOU!GJ%SHT) ;GET A JFN ON ERROR FILE
HRROI 2,[ASCIIZ/ERRMES.BIN/]
GTJFN
JRST .ERER
MOVE 2,[440000,OF%WR]
OPENF
JRST .ERER
MOVNI 3,ERSTE-.ERTAB ;GET LENGTH OF FILE
MOVE 2,[POINT 36,.ERTAB]
SOUT ;OUTPUT THE ERROR FILE DATA
CLOSF ;CLOSE THE FILE
JRST .ERER
HALTF ;DONE

.ERER: MOVEI 1,101 ;TYPE OUT ERROR CODE
HRLOI 2,400000
SETZ 3,
ERSTR
JFCL
JFCL
HALTF

LIT

DEFINE .ERR (N,E,S) <
 .ERQQ=<-.ERTAB>*5
 .ERQQ2=N&37777
 .ERRM1 \.ERQQ2,N,ERQQ
ASCII \S'@\>

DEFINE .ERRM1 (NN,N,.ERQQ)<
 IF1,<IFDEF EZ'NN,<
 PRINTX ERROR N=NN HAS ALREADY BEEN USED
 >>
 EZ'NN==1
 RELOC .ERTAB+NN
 .ERQQ
 RELOC
>

.ERTAB:.ERMAX ;FIRST WORD OF TABLE IS THE LENGTH
 BLOCK .ERMAX ;OF THE TABLE FOR ERSTR TO USE AS
 \ ;A BOUNDS CHECK.
 \ ;LEAVE ROOM FOR POINTERS
 .ERST:.ERCOD ;BUILD STRINGS AND .ERTAB
 .ERSTE: ;END OF STRINGS

END .ERGO

>;END OF IFN .ERBLD CONDITIONAL

PURGE .ERR,REL

END
APPENDIX B

ACTSYM.MAC

This appendix contains the complete copy of the system file ACTSYM.MAC, which defines the symbols used in the manual. The user must include the statement

SEARCH ACTSYM

in his program to have the symbols defined in his assembly.
UNIVERSAL ACTSYM - SYMBOL FILE FOR ACCOUNTING
SUBTTL B.A. HUIZENGA/BAH/TAH - 6-JUN-77

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; PARAMETERS FOR USAGE ITEM DESCRIPTORS

; FIELDS IN DATA ITEM DESCRIPTOR

US%FLG==:77B5 ; FLGS
US%MM==:1B0 ; 1 - IMMEDIATE DATA ITEM
US%TYP==:77B11 ; TYPE CODE
.USASC==:0 ; ASCII
.US/SIX==:1 ; SIXBIT
.US/OCT==:2 ; OCTAL
.US/DEC==:3 ; DECIMAL
.US/DAT==:4 ; DATE-TIME
.US/TAB==:5 ; TABLE (SPECIAL FORM)
.US/VER==:6 ; VERSION NUMBER
.US/SPC==:7 ; SPACE FILL

US%LEN==:777B20 ; LENGTH
US%COD==:77777B35 ; ITEM CODE

; RECORD TYPE CODES

RADIX 10

; **** NOTE RADIX 10 ****

.UTRST==:1 ; SYSTEM RESTART ENTRY
.UTSEN==:2 ; SESSION ENTRY
.UTCKP==:3 ; CHECKPOINT ENTRY (SYSTEM RESTART)
.UTUSB==:4 ; FIRST ENTRY OF USAGE FILE (SAME AS .UTRST)
.UTTAD==:5 ; DATE-TIME CHANGE
.UTBAT==:6 ; BATCH PROCESSOR
.UTINP==:7 ; INPUT SPOOLER ENTRY
.UTOUT==:8 ; OUTPUT SPOOLER ENTRY
.UTFUI==:9 ; FILE USAGE DIRECTORY ENTRY
.UTDSU==:10 ; DISK SPINDLE USAGE ENTRY
.UTMNT==:11 ; STRUCTURE MOUNT ENTRY
.UTMMT==:12 ; TAPE MOUNT ENTRY
.UTDMT==:13 ; DECTape MOUNT ENTRY
.UTFCM==:14 ; FILE COMMAND ENTRY

.UTUSR==:5000 ; USER-DEFINED ENTRY TYPES ARE 5000-9999

RADIX 8

; **** END OF RADIX 10 ****
The format of the data to be passed to the accounting system will consist of a list of items describing the entries in a single record.

The record descriptor list will have a header containing the record type code and the record version information.

Format of a record descriptor:

```
<p>|====================================================================|</p>
<table>
<thead>
<tr>
<th>DEC ver.</th>
<th>CUST ver.</th>
<th>Entry Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flags</td>
<td>Type</td>
<td>Length</td>
</tr>
<tr>
<td>Item Code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data or Address (-1 for default)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \</td>
<td></td>
<td></td>
</tr>
<tr>
<td>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \</td>
<td></td>
<td></td>
</tr>
<tr>
<td>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (Marks end of list)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>====================================================================</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

The generation of these tables will be controlled by the UITEM. macro. All known data items will have a name generated by the use of this macro. If any application dependent items are needed the UITEM. macro may be used to generate the new item. The USENT. macro may be used to generate the first word of the entry descriptor table.

All USAGE entry headers and the system-defined USAGE entry types use the specific item types and these items are ordered by the system.

Installation-defined USAGE entries (with entry types above .UTUSR - 5000 to 9999) use the arbitrary data items (USUAS., USUSX., USUDC., USUOC., USUVR., USUDT., and USUSP.) in the order in which they are to be written into the USAGE entry record. Each arbitrary data record must be preceded by a USUAR. item.

Example of installation-defined USAGE entry:

```
; The following code writes a USAGE entry for a fictitious "file access count" in a user program. This program must be running as an enabled OPERATOR or WHEEL.

; Here to write USAGE entry for file access count

MOVEI T1,.USENT ; USAGE function to write entry
MOVEI T2,FILRDB ; Address of Record Descriptor Block
USAGE ; Write the entry
ERJMP USGERR ; Failed to write entry-- do something else
JRST USGOK ; Entry written-- go on
```
;Record descriptor block for file access count accounting

FILRDB:

USENT. (.UTUSR+12,1,1) ;Entry type 5012= file access count.
USPVR. (<BYTE(3)VWHO(9)VMAJOR(6)VMINOR(18)VEDIT>,US%IMM) ;Version
 ; of this program (for header record).

USUAR. ;Start of first arbitrary record.
USUAS. ([ASCII \This appears in every entry\],,27) ;Text.
USUSP. (,,5) ;Space fill, 5 characters.
USUDC. (FILCNT,,6) ;Count of file accesses, 000000-999999.

USUAR. ;Start of second arbitrary record.
USUSX. (<SIXBIT \FILE: \>;US%IMM,6) ;SIXBIT text for filename.
USUAS. (FILNAM,,200) ;File name, 200 characters.

EXP 0 ;End of entry.

;Storage

FILCNT: BLOCK 1 ;File access count
FILNAM: BLOCK ~D<200/5> ;File name text

& ;;; End of comment
DEFINE UITEM. (NAME, TYPE, LEN) <
    DEFINE US'NAME'. (DATA<1>, IMMED<0>, ULEN<LEN>) <
        USAGE. (.US'NAME, ULEN, TYPE, IMMED, <DATA>)
    >
> DEFINE USENT. (ETYPE, DVER, CVER) <
    BYTE (9) ^D<DVER>, ^D<CVER> (18) ^D<ETYPE>
> DEFINE USAGE. (CODE, LENGTH, TYPE, FLAGS, DATUM) <
    FLAGS+<TYPE>B11+^D<LENGTH>B20+CODE
    DATUM
> DEFINE USDSDK. (TABLE) <
    USAGE. (.USDST, 0, USTAB, US%IMM, <TABLE>)
>
SUBTTL USAGE. ITEM-CODE DEFINITIONS

DEFINE USLIST <

DEFUS (JNO,0,.USDEC,4) ;JOB NUMBER
DEFUS (TAD,1,.USDAT,14) ;CURRENT DATE/TIME
DEFUS (TRM,2,.USASC,1) ;TERMINAL DESIGNATOR
DEFUS (LNO,3,.USOCT,4) ;LINE NUMBER
DEFUS (PNM,4,.USIX,6) ;PROGRAM NAME (CALLER)
DEFUS (PVR,5,.USVER,15) ;PROGRAM VERSION
DEFUS (AMV,6,.USVER,15) ;ACCOUNTING MODULE VERSION
DEFUS (NOD,7,.USIX,6) ;CALLER'S LOCATION
DEFUS (PPN,10,.USOCT,12) ;PROJECT / PROGRAMMER NUMBER (TOPS10 ONLY)
DEFUS (NM1,11,.USASC,12) ;NAME OF USER (TOPS10)
DEFUS (SNM,12,.USASC,39) ;SYSTEM NAME
DEFUS (MVR,13,.USVER,15) ;MONITOR VERSION NUMBER
DEFUS (MBD,14,.USDAT,14) ;MONITOR BUILD DATE
DEFUS (MUP,15,.USDEC,18) ;MONITOR UPTIME (IN SECONDS)
DEFUS (ACT,16,.USASC,12) ;ACCOUNT STRING
DEFUS (LCK,17,.USDAT,14) ;TIME OF LAST CHECKPOINT
DEFUS (RTM,20,.USDEC,9) ;RUNTIME IN MS
DEFUS (CTI,21,.USDEC,11) ;CORE-TIME INTEGRAL (TOPS10 ONLY)
DEFUS (SST,22,.USDAT,14) ;SESSION START TIME
DEFUS (JTY,23,.USDEC,1) ;JOB TYPE (BATCH / TIMESHARING)
DEFUS (BJN,24,.USIX,6) ;BATCH JOB NAME
DEFUS (BSN,25,.USDEC,6) ;BATCH SEQUENCE NUMBER
DEFUS (COM,26,.USASC,39) ;USER COMMENT
DEFUS (DKR,27,.USDEC,8) ;DISK READS
DEFUS (DKW,30,.USDEC,8) ;DISK WRITES
DEFUS (VTI,31,.USDEC,11) ;VIRTUAL CORE-TIME INTEGRAL
DEFUS (EBX,32,.USDEC,9) ;EBOX MEGACOUNTS (CYCLES * 10^6)
DEFUS (MBX,33,.USDEC,9) ;MBOX MEGACOUNTS (CYCLES * 10^6)
DEFUS (MLC,34,.USASC,6) ;MONITOR CALLS
DEFUS (MCM,35,.USASC,6) ;MONITOR COMMANDS
DEFUS (SCD,36,.USASC,3) ;SCHEDULING CLASS
DEFUS (TYI,37,.USDEC,6) ;TTY INPUT CHARACTERS
DEFUS (TYO,40,.USDEC,6) ;TTY OUTPUT CHARACTERS
DEFUS (TYW,41,.USDEC,6) ;TTY WAKEUPS
DEFUS (CPN,42,.USDEC,1) ;NUMBER OF CPUS
DEFUS (CPI,43,.USDEC,4) ;SERIAL NUMBER OF CPU0
DEFUS (CP1,44,.USDEC,4) ;SERIAL NUMBER OF CPU1
DEFUS (CP2,45,.USDEC,4) ;SERIAL NUMBER OF CPU2
DEFUS (CP3,46,.USDEC,4) ;SERIAL NUMBER OF CPU3
DEFUS (CP4,47,.USDEC,4) ;SERIAL NUMBER OF CPU4
DEFUS (CP5,50,.USDEC,4) ;SERIAL NUMBER OF CPU5
DEFUS (RQQ,51,.USDEC,11) ;RUN QUEUE QUOTIENT (TOPS10 ONLY)
DEFUS (NM2,52,.USASC,39) ;NAME OF USER (TOPS20)
DEFUS (CTT,53,.USASC,39) ;CONSOLE CONNECT TIME (SECONDS)
DEFUS (DTL,54,.USDAT,14) ;DATE/TIME BEFORE CHANGE (STAD)
;DISK UTILIZATION RECORD ENTRIES
DEFUS (NRF,55,.USDEC,3) ;NUMBER OF RECORDS FOLLOWING
DEFUS (TAL,56,.USDEC,10) ;TOTAL ALLOCATED STORAGE
DEFUS (TUS,57,.USDEC,10) ;TOTAL STORAGE USED
DEFUS (TNN,60,.USDEC,5) ;TOTAL NUMBER OF FILES
DEFUS (STR,61,.USASC,6) ;STRUCTURE NAME
DEFUS (STP,62,.USDEC,1) ;STRUCTURE TYPE CODE
DEFUS (KTP,63,.USDEC,3) ;CONTROLLER TYPE
DEFUS (DTP,64,.USDEC,3) ;DEVICE TYPE
DEFUS (LIQ,65,.USDEC,6) ;LOGGED IN QUOTA
DEFUS (LOQ,66,.USDEC,6) ;LOGGED OUT QUOTA
DEFUS (TAT,70,.USDAT,14) ;LAST LOGGED IN DATE/TIME
DEFUS (EXP,71,.USASC,1) ;EXPIRED DIRECTORY (Y/N)
DEFUS (DIR,72,.USASC,39) ;DIRECTORY NAME
DEFUS (ALC,73,.USDEC,10) ;ALLOCATED STORAGE
DEFUS (USG,74,.USDEC,10) ;STORAGE USED
DEFUS (PIL,75,.USDEC,5) ;NUMBER OF FILES
DEFUS (PON,76,.USASC,1) ;FILES ONLY INDICATOR (Y/N)

;SPOOLER INFORMATION RECORD ENTRIES
DEFUS (SRT,77,.USDEC,9) ;SPOOLER RUNTIME
DEFUS (SCI,100,.USDEC,11) ;CORE-TIME INTEGRAL
DEFUS (SDR,101,.USDEC,8) ;SPOOLER DISK READS
DEFUS (SDW,102,.USDEC,8) ;SPOOLER DISK WRITES
DEFUS (JNM,103,.USSIX,6) ;JOB NAME
DEFUS (QNM,104,.USSIX,3) ;QUEUE NAME
DEFUS (SIV,105,.USSIX,6) ;PROCESSING DEVICE
DEFUS (SSN,106,.USDEC,6) ;SEQUENCE NUMBER
DEFUS (SUN,107,.USDEC,6) ;SPOOLER UNITS PROCESSED
DEFUS (CRT,110,.USDAT,14) ;CREATION DATE/TIME OF REQUEST
DEFUS (DSP,111,.USSIX,6) ;DISPOSITION
DEFUS (TXT,112,.USASC,39) ;OPR OR SYSTEM TEXT
DEFUS (PRI,113,.USDEC,2) ;PRIORITY
DEFUS (SNF,114,.USDEC,5) ;NUMBER OF FILES PROCESSED
DEFUS (SCD,115,.USDAT,14) ;SCHEDULED DATE/TIME
DEFUS (FRM,116,.USSIX,6) ;FORMS TYPE

;DATE/TIME CHANGE RECORD ENTRIES
DEFUS (OFD,117,.USDEC,7) ;OFFSET IN DAYS
DEFUS (OFS,120,.USDEC,7) ;OFFSET IN SECONDS
DEFUS (ODT,121,.USDAT,14) ;OLD DATE/TIME

;ARBITRARY RECORD ITEM TYPES
DEFUS (UAR,122,.USSPC,0) ;USER-DEFINED ARBITRARY RECORD DELIMITER
DEFUS (US,123,.USSAC,0) ;USER-DEFINED ASCII STRING
DEFUS (USX,124,.USSIX,0) ;USER-DEFINED SIXBIT STRING
DEFUS (UOC,125,.USOCT,0) ;USER-DEFINED OCTAL NUMBER
DEFUS (UDC,126,.USDEC,0) ;USER-DEFINED DECIMAL NUMBER
DEFUS (UDT,127,.USDAT,14) ;USER-DEFINED DATE AND TIME
DEFUS (UVR,130,.USVER,15) ;USER-DEFINED VERSION (STANDARD FORMAT)
DEFUS (USP,131,.USSPC,0) ;USER-DEFINED SPACE FILL

>;; END OF USLIST

B-7
;MACRO TO DEFINE ALL USAGE. ITEM CODES

DEFINE DEFUS (NAM, VAL, TYP, LEN) <
  IFL, <IFDEF .US'NAM, <
    PRINTX .US'NAM ALREADY DEFINED
  >>
    .US'NAM==:VAL
    UIITEM. (NAM, TYP, LEN)
  >

;EXPAND ALL DEFINITIONS

USLIST

;SPECIAL ITEM TYPE CODE DEFINITIONS

.USDSX==:7776 ;STRUCTURE/DIRECTORY INFO WORD (SPECIAL)
.USDST==:7777 ;DISK STATISTICS TABLE POINTER

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