

143

decsystem10

MONITOR CALLS

REFERENCE CARD

(5.06 Monitor)

digital

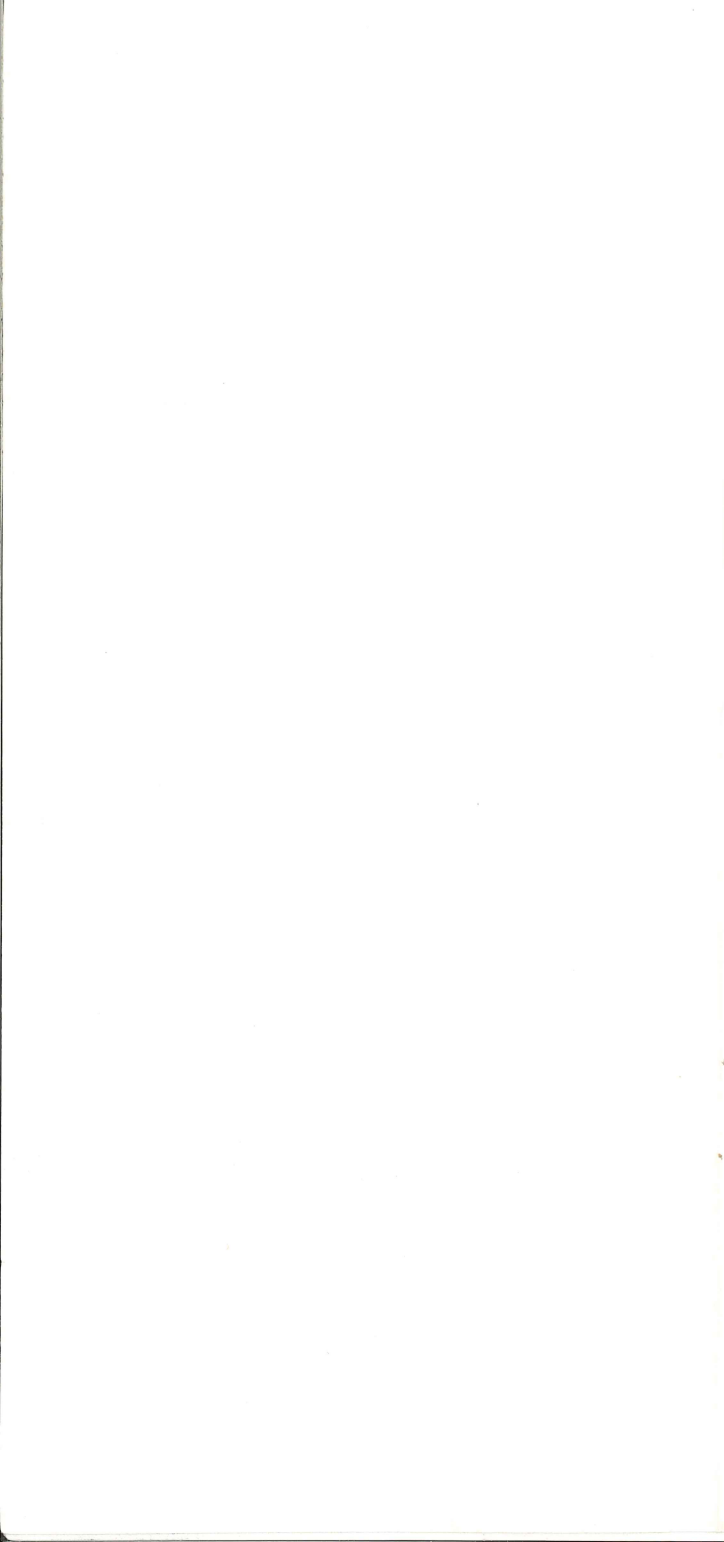


Table 1
Monitor Programmed Operators

Op Code	Call	Function
040	CALL AC, [SIXBIT/NAME/], or NAME AC,	Programmed operator extension (refer to Table 2).
041	INIT D, MODE SIXBIT/DEV/ XWD OBUF, IBUF error return normal return	Select I/O device.
042-046		Reserved for installation-dependent definition.
047	CALLI AC, N	Programmed operator extension (refer to Table 2).
050	OPEN D, E error return normal return E: EXP STATUS SIXBIT/DEV/ XWD OBUF, IBUF	Select I/O device.
051	TTCALL AC, ADR	Extended operations on job-controlling terminal (refer to Table 3).
052-054		Reserved for future expansion by DEC.
055	RENAME D, E error return normal return E: SIXBIT/FILE/ SIXBIT/EXT/ EXP<PROT>B8+DATE XWD PROJ, PROG	Rename or delete a file.
056	IN D, normal return error or EOF return	INPUT and skip on error or EOF.
057	OUT D, normal return error return	OUTPUT and skip on error or EOT.
060	SETSTS D, STATUS	Set file status.
061	STATO D, BITS nonskip return: NO SELECTED BITS = 1 skip return: SOME SELECTED BITS = 1	Skip if file status bits = 1.
062	GETSTS D, E	Copy file status to E.
063	STATZ D, BITS nonskip return: SOME SELECTED BITS = 1 skip return: ALL SELECTED BITS = 0	Skip if file status bits = 0.

Table 1 (Cont.)
Monitor Programmed Operators

Op Code	Call	Function
064	INBUF D, N	Set up input buffer ring with N buffers.
065	OUTBUF D, N	Set up output buffer ring with N buffers.
066	INPUT D,	Request input or request next buffer.
067	OUTPUT D,	Request output or request next buffer.
070	CLOSE D,	Terminate file operation.
071	RELEAS D,	Release device.
072	MTAPE D, N	Perform tape positioning operation (refer to Table 4).
073	UGETF D,	Get next free block number on DECtape.
074	USETI D, E	Set next input block number.
075	USETO D, E	Set next output block number.
076	LOOKUP D, E error return normal return E: SIXBIT/FILE/ SIXBIT/EXT/ 0 XWD PROJ, PROG	Select a file for input.
077	ENTER D, E error return normal return E: SIXBIT/FILE/ SIXBIT/EXT/ 0 XWD PROJ, PROG	Select a file for output.
100	UJEN	Dismiss real-time interrupt.

Table 2
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
-2,...,-n	Customer defined	Reserved for definition by each customer installation.
-1	LIGHTS AC,	Display AC in console lights.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
Ø	RESET AC, only return	Reset I/O device.
1	MOVEI AC, BUFFER DDTIN AC only return	DDT mode console input.
2	MOVEI AC, DDT-start-adr SETDDT AC, only return	Set protected DDT starting address.
3	MOVEI AC, BUFFER DDTOUT AC, only return	DDT mode console output.
4	MOVE AC, [SIXBIT/dev/] or MOVEI AC, channel no. DEVCHR AC, only return C(AC) = 0 if no such device C(AC) = DEVMOD word of device data block if device is found.	Get device characteristics (refer to Table 7).
5	DDTGT AC, only return	No operation; historical UUO.
6	MOVE AC, [SIXBIT/dev/] GETCHR AC, only return	Same as CALLI AC,4.
7	DDTRL AC, only return	No operation; historical UUO.
1Ø	MOVEI AC, channel no. WAIT AC, only return	Wait until device is inactive.
11	MOVE AC, [XWD HIGH ADR or 0, LOW ADR or 0] CORE AC, error return, assignment unchanged normal return, new assignment AC: = max. core available (in 1 K blocks) on error or normal return.	Allocate core.
12	EXIT AC, only return If AC ≠ 0, devices are not released and CONT and CCONT commands are effective.	Stop job, may release devices de- pending on contents of AC.
13	MOVEI AC, channel no. UTPCLR AC, only return	Clear DECtape directory.
14	DATE AC, only return AC: = date as (Y-1964)*12+M)*31+D	Return date.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
15 ¹	<p>MOVE AC, [XWD -N, LOC] LOGIN AC, return: Does not return if C(R0) is a HALT instruction.</p>	Privileged UUO available only to system-privileged programs. Is a no-op if executed by a job already logged-in.
16	<p>MOVEI AC, BITS APRENB AC, return</p>	Enable central processor traps.
17 ¹	<p>LOGOUT AC, no return</p>	Privileged UUO available only to system-privileged programs. Is treated like an EXIT UUO if executed by a non-system-privileged program.
20	<p>SWITCH AC, return AC: contents of console data switches</p>	Read console data switches.
21	<p>MOVE AC, job number MOVE AC+1, [SIXBIT/dev/] REASSIGN AC, return If C(AC) = 0 on return, the job specified has not been initialized. If C(AC+1) = 0 on return, the device is not assigned to calling job, or device is TTY.</p>	Reassign device.
22	<p>TIMER AC, return AC: = time in jiffies, right-justified.</p>	Read time of day in clock ticks.
23	<p>MSTIME AC, return AC: = time in milliseconds, right-justified.</p>	Read time of day in milliseconds.
24	<p>GETPPN AC, normal return alternate return AC: = XWD proj. no., prog. no. of this job. Alternate return is taken only if job is privileged and the same proj-prog number occurs twice in the table of jobs logged in.</p>	Return project-programmer number of job.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
25	MOVE AC, [XWD N, LOC] TRPSET AC, error return normal return LOC: JSR TRAP	Set trap for user I/O mode.
26	TRPJEN AC,	Illegal UWO; replaced by UJEN (op code 100).
27	MOVE AC, job number or 0 RUNTIM AC, only return AC: = running time of job AC: = 0 if nonexistent job	Return the job's running time in milliseconds.
30	PJOB AC, return AC: = job number, right-justified.	Return job number.
31	MOVE AC, time to sleep in seconds SLEEP AC, return	Stop job for specified time in seconds.
32	SETPOV AC, return	Superseded by APRENB UWO.
33	MOVEI AC, exec adr PEEK AC, return AC: = C(exec-adr)	Return contents of executive address.
34	GETLIN AC, return AC: = SIXBIT TTY name, left-justified (e.g., CTY, TTY27)	Return SIXBIT name of attached terminal.
35	MOVSI AC, start adr increment HRRJ AC, E RUN AC, error return normal return E: SIXBIT/DEVICE/ SIXBIT/FILE/ SIXBIT/EXT/ 0 XWD proj no. prog no. XWD 0; optional core assignment	Transfer control to selected programs.
36	MOVEI AC, BIT SETUWP AC, error return normal return	Set or clear user mode write protect for high segment.
37	MOVEI AC, highest address in low segment REMAP AC, error return normal return	Remap top of low segment into high segment.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
40	<p>MOVEI AC, E GETSEG AC, error return normal return E: SIXBIT/DEVICE/ SIXBIT/FILE/ SIXBIT/EXT/ 0 XWD proj no., prog no. 0</p>	Replace high segment in user's addressing space.
41	<p>MOVSI AC, job no. or index no. HRRI AC, table no. GETTAB AC, error return normal return C(AC) unchanged on error return AC: = table entry if table is defined and index is in range.</p>	Return contents of monitor table or location (refer to Table 9).
42	<p>MOVEI AC, highest physical adr. desired SPY AC, error return normal return</p>	Make physical core be high segment for examination of monitor.
43	<p>MOVE AC, [SIXBIT/NAME/] SETNAM AC, return</p>	Set program name in monitor job table.
44	<p>MOVE AC, [XWD CODE, BLOCK] TMPCOR AC, error return normal return BLOCK: XWD NAME, 0 IOWD BUFFLEN, BUFFER AC: = value depending on CODE and whether error or normal return is taken.</p>	Allow temporary in-core file storage for job.
45	<p>MOVE AC, [XWD+N, LOC] DSKCHR AC, error return normal return AC: = XWD status, configuration LOC: = SIXBIT/NAME/ 0 0 0 } values returned</p>	Return disk characteristics.
46	<p>MOVEI AC, 0 or MOVE AC, [SIXBIT/FSNAME/] SYSSTR AC, error return - not a file structure normal return AC: = next file structure name in SIXBIT, left-justified</p>	Return next file structure name.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function												
47	<p>MOVE AC, [XWD N, LOC] JOBSTR AC, error return normal return AC: = argument</p> <table><tr><td>Contents</td><td>Use</td></tr><tr><td>LOC/SIXBIT/NAME/or -1</td><td>arg</td></tr><tr><td>LOC+1/XWD proj no.</td><td></td></tr><tr><td>prog. no.</td><td>value</td></tr><tr><td>LOC+2/status bits</td><td>value</td></tr></table>	Contents	Use	LOC/SIXBIT/NAME/or -1	arg	LOC+1/XWD proj no.		prog. no.	value	LOC+2/status bits	value	Return next file structure name in a jobs search list.		
Contents	Use													
LOC/SIXBIT/NAME/or -1	arg													
LOC+1/XWD proj no.														
prog. no.	value													
LOC+2/status bits	value													
50	<p>MOVE AC, [XWD N, LOC] STRUUO AC, error return normal return AC: = status or error code</p> <table><tr><td>Contents</td><td>Use</td></tr><tr><td>LOC: function</td><td></td></tr><tr><td>numbers</td><td>arg</td></tr><tr><td>LOC+1</td><td>arg depending</td></tr><tr><td>:</td><td>on function</td></tr><tr><td>:</td><td>number</td></tr></table>	Contents	Use	LOC: function		numbers	arg	LOC+1	arg depending	:	on function	:	number	Manipulate file structures.
Contents	Use													
LOC: function														
numbers	arg													
LOC+1	arg depending													
:	on function													
:	number													
51	<p>MOVEI AC, 0 or last unit name SYSPHY AC, error return normal return</p>	Return all physical disk units.												
52		Reserved for future use.												
53	<p>MOVE AC, [SIXBIT/dev/] or MOVEI AC, channel no. DEVTP AC, error return normal return</p>	Return properties of device (refer to Table 8).												
54	<p>MOVEI AC, channel no. of dev. DEVSTS AC, error return normal return</p>	Return hardware device status word.												
55	<p>MOVE AC, [SIXBIT/DEV/] DEVPPN AC, error return normal return AC: = XWD proj-prog. number on a normal return.</p>	Return the project-programmer number associated with a device.												
56	<p>AC is software channel number SEEK AC, return</p>	Perform a SEEK to current selected block for software channel AC.												
57	<p>MOVEI AC, RTBLK RTTRP AC, error return normal return</p>	Connect real-time devices to PI system.												

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
60	MOVE AC, [XWD high seg code, low seg code] LOCK AC, error return normal return	Lock job in core.
61	MOVEI AC, channel no. or MOVNI AC, job JOBSTS AC, error return normal return	Return status information about device TTY and/or controlled job.
62	MOVEI AC, location LOCATE AC, error return normal return	Change the job's logical station.
63	MOVEI AC, channel no. or MOVE AC, [SIXBIT/dev/] WHERE AC, error return normal return	Return the physical station of the device.
64	MOVEI AC, channel no. or MOVE AC, [SIXBIT/dev/] DEVNAM AC, error return normal return	Return physical name of device obtained through generic INIT/OPEN or logical device assignment.
65	MOVE AC, job number CTLJOB AC, error return normal return	Return job number of controlling job.
66	MOVE AC, [XWD N,LOC] GOBSTR AC error return normal return LOC: job number LOC+1: XWD proj,prog LOC+2: SIXBIT/NAME/ or -1 LOC+3: 0 LOC+4: Status bits	Return next file structure name in an arbitrary job's search list.
67 70		} Reserved for the future.
71	MOVE AC, high-priority queue no. HPQ AC, error return normal return	
72	MOVSI AC, enable bits HRR1 AC, sleep time HIBER AC, error return normal return	Allow job to become dormant until the specified event occurs.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
73	MOVE AC, job no. WAKE AC, error return normal return	Allow job to activate the specified dormant job.
74 ¹	MOVE AC, new proj.prog.no. CHGPPN AC, error return normal return	Change project-programmer number. Gives an error return if executed by a job already logged in.
75	MOVE AC [XWD function, argument] SETUO AC, error return normal return	Set system and job parameters.
76		Reserved for the future.
77	OTHUSR AC, non-skip return skip return AC: = proj. prog. no.	Determine if another job is logged in with same project-programmer number.
100	MOVE AC, [EXP LOC] CHKACC AC, error return normal return LOC: XWD action, protection LOC+1: directory proj-prog no. LOC+2: user proj-prog no.	Check user's access to the file specified.
101	MOVE AC, [EXP LOC] DEVSIZ AC, error return normal return LOC: EXP STATUS LOC+1: SIXBIT/dev/	Determine buffer size for the specified device.
102	MOVE AC, [XWD + length, adr of arg. list] DAEMON AC, error return normal return	Request DAEMON to perform a specified task.
103 ¹	MOVE AC, adr of arg block JOBPEK AC, error return normal return	Read or write another job's core. Gives the error return if executed by a non-system-privileged program.
104 ¹	MOVE AC, [XWD line no., job no.] ATTACH AC, error return normal return	Attach the job to the specified TTY line number. Gives the error return if executed by a non-system-privileged program.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
105 ¹	MOVE AC, [XWD + length, adr of arg. list] DAEFIN AC, error return normal return	Indicate that the request to the DAEMON program has been completed. Gives the error return if executed by a non-system-privileged program.
106 ¹	MOVE AC, [XWD + length, adr of arg. list] FRUUO AC, error return normal return	Force a command for a job. Gives the error return if executed by a non-system-privileged program.
107	MOVE AC, [SIXBIT/dev/] or MOVEI AC, channel no. MOVE AC+1, [SIXBIT/logical name/] DEVLNM AC, error return normal return	Set a logical name for this specified device.
110	MOVE AC, [XWD + length, adr of argument list] PATH. AC, error return normal return ADR: N or SIXBIT/NAME/ ADR+1: Scan switch ADR+2: PPN ADR+3: SFD name ADR+4: SFD name : : LOC+N-1:	Read or modify the default directory path or read the current path of a file OPEN on a channel; or set and/or test the additional path (SYS, NEW, OLD).
111	MOVE AC, [XWD N, LOC] METER. AC, error return normal return LOC: function code LOC+1: argument depends LOC+2: on function code used. : : LOC+N-1:	Provide performance analysis and metering of dynamic system variables.
112	MOVEI AC, channel no. or MOVE AC, [SIXBIT/dev/] MTCHR. AC, error return normal return	Return characteristics of the magnetic tape.
113 ¹	MOVE AC, [2,,BLOCK] JBSET. AC, error return normal return BLOCK: 0,, job number BLOCK+1: function,, value	Execute the specified function of SETUUO for a particular job.

Table 2 (Cont.)
CALL and CALLI Monitor Operations

CALLI Number	CALL	Function
114	MOVE AC, [3,,BLOCK] POKE. AC, error return normal return BLOCK: location BLOCK+1: old value BLOCK+2: new value	Alter the specified location in the Monitor.
115	MOVE AC, job number TRMNO. AC, error return normal return	Return number of the terminal currently controlling the specified job.
116	MOVE AC, [XWD N, ADR] TRMOP. AC, error return normal return ADR: function code ADR+1: terminals' universal . index . Following . arguments depend on . function used.	Perform miscellaneous terminal functions.
117	MOVE AC, channel no. RESDV. AC, error return normal return	Reset the specified channel.
120	MOVSI AC, 1 MOVSI AC, 0 HRR1 AC, 1 HRR1 AC, 0 UNLOK. AC, error return normal return	Unlock a locked job in core.
121	MOVE AC, [XWD function, ADR] DISK. AC, error return normal return	Set or read a disk or file system parameter (e.g., set the disk priority for a channel or the job).
122 ¹	MOVE AC, [SIXBIT/dev/] or MOVEI AC, channel no. DVRST. AC, error return normal return	Restrict the specified device to a privileged job.
123 ¹	MOVE AC, [SIXBIT/dev/] or MOVEI AC, channel no. DVURS. AC, error return normal return	Remove the restricted status of the specified device.

¹ This CALLI is a system-privileged UWO available only to users logged in under [1,2] or to programs running with the JACCT bit set. Complete documentation for system-privileged UWO's appears in the Specifications section of the DECsystem-10 Software Notebooks.

Table 3
TTCALL Functions

AC Field	Mnemonic	Action
0	INCHRW	Input character and wait .
1	OUTCHR	Output a character .
2	INCHRS	Input character and skip .
3	OUTSTR	Output a string .
4	INCHWL	Input character, wait, line mode .
5	INCHSL	Input character, skip, line mode .
6	GETLCH	Get line characteristics .
7	SETLCH	Set line characteristics .
10	RESCAN	Reset input stream to command .
11	CLRBFI	Clear type-in buffer .
12	CLRBRO	Clear type-out buffer .
13	SKPINC	Skip if a character can be input .
14	SKPINL	Skip if a line can be input .
15	IONEOU	Output as an image character .
16-17		(Reserved for expansion) .

Table 4
MTAPE Functions

Symbol	Function	Action
MTWAT.	0	No operation; wait for spacing and I/O to finish.
MTREW.	1	Rewind to load point.
MTEOF.	3	Write EOF.
MTSKR.	6	Skip one record.
MTBSR.	7	Backspace record.
MTEOT.	10	Space to logical end of tape; terminates either at two consecutive EOF marks or at the end of first record beyond end of tape marker.
MTUNL.	11	Rewind and unload.
MTBLK.	13	Write 3 in. of blank tape.
MTSKF.	16	Skip one file; implemented by a series of skip record operations.
MTBSF.	17	Backspace files; implemented by a series of backspace record operations.

Table 4 (Cont.)
MTAPE Functions

Symbol	Function	Action
MTDEC.	100	Initialize for Digital-compatible 9-channel. ¹
MTIND.	101	Initialize for industry-compatible 9-channel tape. ²

¹Digital-compatible mode writes (or reads) 36 data bits in five frames of a 9-track magnetic tape. It can be any density, any parity, and is not industry compatible. This mode is in effect until a RELEAS D, or a MTIND. D, is executed.

²Industry-compatible 9-channel mode writes (or reads) 32 data bits per word in four frames of a 9-track magtape and ignores the low order four bits of a word. It must be 800 bits/in. density, odd parity.

Table 5
Extended LOOKUP, ENTER, and RENAME Arguments

Rel. Loc	Symbol	Arguments and Value
0	.RBCNT	Count of arguments following.
1	.RBPPN	Directory name (project-programmer no.) or pointer .
2	.RBNAM	Filename in SIXBIT .
3	.RBEXT	File extension (LH). High order 3 bits of 15-bit creation date (bits 18-20). Access date (bits 21-35).
4	.RBPRV	Privilege (bits 0 - 8). Mode (bits 9-12). Creation time (bits 13-23). Low order 12 bits of 15-bit creation date (bits 24-35).
5	.RBSIZ	Length of file in data words written (+ no. words) .
6	.RBVER	Octal version number (36 bits) .
7	.RBSP L	Filename to be used in output spooling.
10	.RBEST	Estimated length of file (+ no. blocks).
11	.RBALC	Highest relative block number within the file allocated by user or monitor to file (not counting 2nd RIB).
12	.RBPOS	Logical block no. of first block to allocate within F.S.
13	.RBFTI	Future nonprivileged argument - reserved for DEC .
14	.RBNCA	Nonprivileged argument reserved for customer to define .
15	.RBMTA	Tape label if on backup tape .

Table 5 (Cont.)
Extended LOOKUP, ENTER, and RENAME Arguments

Rel. Loc	Symbol	Arguments and Value
16	.RBDEV	Logical unit name on which the file is located.
17	.RBSTS	1) LH=Combined status of all files in UFD 2) RH=Status of this file.
20	.RBELB	Bad logical block within error unit.
21	.RBEUN	1) LH=Logical unit no. within F.S. of bad unit (0,,,N). 2) RH=No. of consecutive blocks in bad region.
22	.RBQTF	(UFD-only) FCFS logged-in quota in blocks.
23	.RBQTO	(UFD-only) logged-out quota in blocks.
24	.RBQTR	(UFD-only) reserved logged-in quota.
25	.RBUSD	(UFD-only) no. of blocks used at last logout.
26	.RBAUT	Author project-programmer number (creator or superseder).
27	.RBNXT	Next file structure name if file continued.
30	.RBPRD	Predecessor file structure name if file continued.
31	.RBPCA	Privileged argument word reserved for each customer to define as he wishes.
32	.RBUFD	Logical block number within F.S. (not cluster no.) of the RIB of the UFD in which the name of this file appears.
33	.RBFLR	Relative block number in file of first block in RIB.
34	.RBXRA	Extended RIB address.
35	.RBTIM	Creation date in universal date-time standard (LH = days since Nov. 17, 1858 and RH = fraction of one day).

Table 6
File Status Bits

Bit	Meaning
18	Improper mode (IO.IMP). Attempt to write on a software write-locked tape or file structure, or a software detected redundancy failure occurred. Usually set by monitor.
19	Hard device detected error (IO.DER), other than data parity error. This is a search, power supply, or channel memory parity error. The device is in error rather than the data on the medium. However, the data read into core or written on the device is probably incorrect. Usually set by monitor.

Table 6 (Cont.)

File Status Bits

Bit	Meaning
20	Hard data error (IO.DTE). The data read or written has incorrect parity as detected by hardware (or by software on CDR, PTR). The user's data is probably non-recoverable even after the device is fixed. Usually set by monitor.
21	Block too large (IO.BKT). A block of data from a device is too large to fit in a buffer; a block number is too large for the unit the file structure (DSK) or unit (DTA) has filled; or the user's quota on the file structure has been exceeded. Usually set by monitor.
22	End of file (IO.EOF). The user program has requested data beyond the last record or block with an IN or INPUT UUC, or USETI has specified a block beyond the last data block of the file. When set, no data has been read into the input buffer. Usually set by monitor.
23	I/O active (IO.ACT). The device is actively transmitting or receiving data. Always set by monitor.
24-29	Device dependent parameters usually set by user. <ul style="list-style-type: none"> CDP Bit 29 = DEC029 CDR Bit 29 = Super image mode DSK Bit 29 = Write pack headers DTA Bit 28 = Semi-standard I/O mode Bit 29 = Nonstandard I/O mode MTA Bit 24 = Beginning of tape Bit 25 = End of tape Bit 26 = I/O parity Bits 27-28 = I/O density Bit 29 = No reread PTY Bit 24 = TTY input wait Bit 25 = TTY output wait Bit 26 = Read by monitor TTY Bit 27 = Suppress $\text{\\$}$ echo Bit 28 = Suppress echo Bit 29 = Full character set
30	Synchronous input (IO.SYN). Stops the device after each buffer is filled. Usually set by user.
31	User word count (IO.UWC). Forces the monitor to use the word count in the third word of the buffer (output only). The monitor normally computes the word count from the byte pointer in the buffer header. Usually set by user.
32-35	Data mode (IO.MOD). Usually set by user. <ul style="list-style-type: none"> 0 ASCII. Seven bit bytes packed left-justified, five characters per word. 1 ASCII line. Same as 0, except that the buffer is terminated by a FORM, VT, LINE-FEED, or ALTMODE character. Differs from ASCII on TTY (half-duplex software) and PTR only.

Table 6 (Cont.)

File Status Bits

Bit	Meaning
2 - 7	Unused.
10	Image. A device dependent mode. Thirty-six bit bytes. The buffer is filled with data exactly as supplied by the device.
11-12	Unused.
13	Image binary. Thirty-six bit bytes. This mode is similar to binary mode, except that no automatic formatting or check-summing is done by the monitor.
14	Binary. Thirty-six bit bytes. This is blocked format consisting of a word count, n (the right half of the first data word of the buffer), followed by n 36-bit data words. Checksum for cards and paper tape.
15	Image dump. A device dependent dump mode. Thirty-six bit bytes.
16	Dump as records without core buffering. Data is transmitted between any contiguous block of core and one or more standard length records on the device for each command word in the command list. Thirty-six bytes.
17	Dump one record without core buffering. Data is transmitted between any contiguous block of core and exactly one record of arbitrary length on the device for each command word in the command list. Thirty-six bit bytes.

Table 7

DEVCHR Bits

Name	Bit	Explanation
DV.DRI	Bit 0 = 1	DECTape directory is in core. This bit is cleared by an ASSIGN or DEASSIGN to that unit.
DV.DSK	Bit 1 = 1	Device is a disk.
DV.CDR	Bit 2 = 1	Device is a card reader (DV.IN = 1) or card punch (DV.OUT = 1)
DV.LPT	Bit 3 = 1	Device is a line printer.
DV.TTA	Bit 4 = 1	TTY is controlling a job.
DV.TTU	Bit 5 = 1	TTY is in use as a user terminal (even if detached).
DV.TTB	Bit 6 = 1	Unused.
DV.DIS	Bit 7 = 1	Device is a display.
DV.LNG	Bit 8 = 1	Device has a long dispatch table (that is, UUO's other than INPUT, OUTPUT, CLOSE, and RELEASE perform real actions).

Table 7 (Cont.)

DEVCHR Bits

Name	Bit	Explanation
DV.PTP	Bit 9 = 1	Device is a paper-tape punch.
DV.PTR	Bit 10 = 1	Device is a paper-tape reader.
DV.DTA	Bit 11 = 1	Device is a DECtape.
DV.AVL	Bit 12 = 1	Device is available to this job or is already assigned to this job.
DV.MTA	Bit 13 = 1	Device is a magnetic tape.
DV.TTY	Bit 14 = 1	Device is a TTY.
DV.DIR	Bit 15 = 1	Device has a directory (DTA or DSK).
DV.IN	Bit 16 = 1	Device can perform input.
DV.OUT	Bit 17 = 1	Device can perform output.
DV.ASC	Bit 18 = 1	Device is assigned by a console command.
DV.ASP	Bit 19 = 1	Device is assigned by program (INIT or OPEN).
	Remaining bits	If bit 35-n contains a 1, then mode n is legal for that device. The mode number (0 through 17) must be converted to decimal (e.g., mode 17 ₈ is represented by bit 35-15 ₁₀ or bit 20).

Table 8

DEV TYP Bits

Name	Bit	Explanation
TY.MAN	Bit 0 = 1	LOOKUP/ENTER mandatory.
	Bits 1 - 11	Reserved for the future.
TY.AVL	Bit 12 = 1	Device is available to this job.
TY.SPL	Bit 13 = 1	Spoiled on disk. (Other bits reflect properties of real device, except variable buffer size.)
TY.INT	Bit 14 = 1	Interactive device (output after each break character).
TY.VAR	Bit 15 = 1	Capable of variable buffer size (user can set his own buffer lengths).
TY.IN	Bit 16 = 1	Capable of input.
TY.OUT	Bit 17 = 1	Capable of output.
TY.JOB	Bits 18-26	Job number that currently has device INITed or ASSIGNED.
	Bits 27-28	Reserved for the future.
TY.RAS	Bit 29	Device is a restricted device (i.e., can be assigned only by a privileged job or the MOUNT command).

Table 8 (Cont.)

DEVTYPE Bits

Name	Bit	Explanation
TY.DEV	Bits 30-35	Device type code. Code 0 (.TYDSK) Disk of some sort Code 1 (.TYDTA) DECtape Code 2 (.TYMTA) Magnetic tape Code 3 (.TYTTY) TTY or equivalent Code 4 (.TYPTR) Paper-tape reader Code 5 (.TYPTP) Paper-tape punch Code 6 (.TYDIS) Display Code 7 (.TYLPT) Line printer Code 10 (.TYCDR) Card reader Code 11 (.TYCDP) Card punch Code 12 (.TYPTY) Pseudo-TTY Code 13 (.TYPLT) Plotter Code 14-57 Reserved for Digital Code 60-77 Reserved for customer

Table 9

GETTAB Tables

Table Numbers (RH of AC)	Table Names	Explanation
00	.GTSTS	Job status word; index by job or segment number.
01	.GTADR	Job relocation and protection; index by job or segment number.
02	.GTPPN	Project and programmer numbers; index by job or segment number.
03	.GTPRG	User program name; index by job or segment number.
04	.GTTIM	Total run time used in units of jiffies; index by job number.
05	.GTKCT	Kilo-Core ticks of job; index by job number.
06	.GTPRV	Privilege bits of job, index by job number.
07	.GTSWP	Swapping parameters of job; index by job or segment number.
10	.GTTY	Terminal-to-job translation; index by job number.
11	.GTCNF	Configuration table; index by item number.
12	.GTNSW	Nonswapping data; index by item number.
13	.GTSMT	Swapping data; index by item number.

Table 9 (Cont.)

GETTAB Tables

Table Numbers (RH of AC)	Table Names	Explanation
14	.GTSGN	High segment table; index by job number. Bit 0 = 0, then bits 18-35 are index of high segment (if bits 18-35 = 0, then there is no high segment). Bit 0 = 1, then bits 18-35 are number of K to spy on. Bit 1 (SN%SHR) = 1 if job has a high segment that is sharable. Bit 5 (SN%LOK) = 1 if job has a high segment that is locked.
15	.GTODP	Once-only disk parameters; index by item number.
16	.GTLDV	5-series monitor disk parameters; index by item number.
17	.GTRCT	Disk blocks read by job; used by DSK command: a. Bits 0-11 = incremental blocks b. Bits 13-35 = total blocks since start of job. Index by job number. Job 0 indicates the number of blocks swapped in.
20	.GTWCT	Disk blocks written by job: a. Bits 0-11 = incremental blocks. b. Bits 12-25 = total blocks since start of job. Index by job number. Job 0 indicates the number of blocks swapped out.
21	.GTDBS	Reserved for future.
22	.GTTDB	Reserved for future.
23	.GTSLF	Table of GETTAB addresses (GETTAB immediate); index by GETTAB table number.
24	.GTDEV	Device or file structure name of sharable high segment. Index by high segment number.
25	.GTWSN	Two-character SIXBIT names for job queues; index by item numbers.
26	.GTLOC	Job's logical station; index by job number.
27	.GTCOR	Physical core allocation. One bit per one K of core if system does not include LOCK UUO. Two bits per entry if system includes LOCK UUO. A non-zero entry indicates core in use.
30	.GTCOM	Table of SIXBIT names of monitor commands.

Table 9 (Cont.)

GETTAB Tables

Table Numbers (RH of AC)	Table Names	Explanation
31	.GTNM1	First half of name of user in SIXBIT; index by job number.
32	.GTNM2	Last half of name of user in SIXBIT; index by job number.
33	.GTCNO	Job's charge number, index by job number.
34	.GTTMP	Job's TMPCOR pointers; index by job number.
35	.GTWCH	Job's WATCH bits; index by job number.
36	.GTSPL	Job's spooling control bits; index by job number.
37	.GTRTD	Job's real-time status word; index by job number.
40	.GTLIM	Job's time limit in jiffies and Batch status; index by job number. a. Bits 1-9 (JB.LCR) = job's core limit. b. Bit 10 = 1 (JB.LBT) if a Batch job. d. Bit 11 = 1 (JB.LSY) if program comes from SYS. Set on R command or equivalent. Cleared on R command (or equivalent) or SETNAM UWO. d. Bits 12-35 (JB.LTM) = job's time limit.
41	.GTQQQ	Timesharing scheduler's queue headers.
42	.GTQJB	Timesharing scheduler's queue that job is in; index by job number.
43	.GTCM2	Table of SET command names.
44	.GTCRS	Status of hardware taken on a crash. 0: CR.SAP = CONI APR, 1: CR.SPI = CONI PI, 2: CR.SSW = DATAI APR The remainder of the table contains the statuses of the various devices.
45	.GTISC	Swapper's input scan list of queues.
46	.GTOSC	Swapper's output scan list of queues.
47	.GTSSC	Scheduler's scan list of queues.
50	.GTRSP	Response counter table. Time in jiffies when user started to wait for his job to run. This time is cleared when the job is first given to the processor by the scheduler.

Table 9 (Cont.)

GETTAB Tables

Tables Numbers (RH of AC)	Table Names	Explanation
51	.GTSYS	System variables which are independent of CPU.
52	.GTWHY	Operator why comments in ASCIZ.
53	.GTTRQ	Total time job was in run queues whether it was running or not.
54	.GTSPS	Job status word of second processor. Bit 29 (SP.SC0) = SET CPU command can be used. Bit 35 (SP.CR0) = SET CPU UUO can be used. Bits for other processors can be obtained by shifting left 1 bit per processor.
55	.GTC0C	CPU0 CDB constants; index by item number.
56	.GTC0V	CPU0 CDB variables; index by item number.
57	.GTC1C	CPU1 CDB constants; index by item number; see .GTC0C.
60	.GTC1V	CPU1CDB variables; index by item number; see .GTC0V.
61	.GTC2C	CPU2 CDB constants; index by item number; see .GTC0C.
62	.GTC2V	CPU2 CDB variables; index by item number; see .GTC0V.
63	.GTC3C	CPU3 CDB constants, index by item number; see .GTC0C.
64	.GTC3V	CPU3 CDB variables; index by item number; see .GTC0V.
65	.GTC4C	CPU4 CDB constants; index by item number; see .GTC0C.
66	.GTC4V	CPU4 CDB variables; index by item number; see .GTC0V.
67	.GTC5C	CPU5 CDB constants; index by item number; see .GTC0C.
70	.GTC5V	CPU5 CDB variables; index by item number; see .GTC0V.
71	.GTFET	Current setting of all features defined in F.MAC, index by item number.
72	.GTEDN	Table of ersatz device names.

Table 10
Job Data Area Locations
(for user-program reference)

Name	Octal Location	Description
.JBUUO	40	User's location 40 ₈ . Used by the hardware when processing user UUO's (001 through 037) for storing op code and effective address.
.JB41	41	User's location 41 ₈ . Contains the beginning address of the user's programmed operator service routine (usually a JSR or PUSHJ).
.JBERR	42	Left half: Unused. Right half: Accumulated error count from one system program to the next. System programs should be written to look at the right half only.
.JBREL	44	Left half: Zero. Right half: The highest relative core location available to the user (i.e., the contents of the memory protection register when this user is running).
.JBBLT	45	Three consecutive locations when the LOADER puts a BLT instruction and a CALLI UUO to move the program down on top of itself. These locations are destroyed on every executive UUO by the executive pushdown list.
.JBDDT	74	Left half: The last address of DDT. Right half: The starting address of DDT. If contents are 0, DDT has not been loaded.
.JBCN6	106	Six temporary locations used by the CHAIN program (refer to the LOADER manual) after it releases all I/O channels. .JBCN6 is defined to be in .JBIDA.
.JBPFI	114 (value)	All user I/O must be to locations greater than .JBPFI.
.JBHRL	115	Left half: First relative free location in the high segment (relative to the high segment origin so it is the same as the high segment length). Set by the LOADER and subsequent GETs, even if there is no file to initialize the low segment. The left half is a relative quantity because the high segment can appear at different user origins at the same time. The SAVE command uses this quantity to know how much to write from the high segment. Right half: Highest legal user address in the high segment. Set by the monitor every time the user starts to run or does a CORE or REMAP UUO. The word is ≥ 401777 unless there is no high segment, in which case it is zero. The proper way to test if a high segment exists is to test this word for a non-zero value.

Table 10 (Cont.)
Job Data Area Locations
(for user-program reference)

Name	Octal Location	Description
.JBSYM	116	Contains a pointer to the symbol table created by linking loader. Left half: Negative of the length of the symbol table. Right half: Lowest address used by the symbol table.
.JBUSY	117	Contains a pointer to the undefined symbol table created by linking loader or defined by DDT. This location has the same format as .JBSYM. There are no undefined symbols if the contents is ≥ 0 .
.JBSA	120	Left half: First free location in low segment (set by loader). Right half: Starting address of the user's program.
.JBFF	121	Left half: Zero. Right half: Address of the first free location following the low segment. Set to $C(.JBSA)_{LH}$ by RESET UUO.
.JBREN	124	Left half: Unused. Right half: REENTER starting address. Set by user or by loader and used by REENTER command as an alternate entry point.
.JBAPR	125	Left half: Zero. Right half: Set by user program to trap address when user is enabled to handle APR traps such as illegal memory, pushdown overflow, arithmetic overflow, and clock.
.JBCNI	126	Contains state of APR as stored by CONI APR when a user-enabled APR trap occurs.
.JBTPC	127	Monitor stores PC of next instruction to be executed when a user-enabled APR trap occurs.
.JBOPC	130	The previous contents of the job's last user mode program counter are stored here by monitor on execution of a DDT, REENTER, START, or CSTART command. After a user program HALT instruction followed by a START, DDT, CSTART, or REENTER command, .JBOPC contains the address of the HALT. To proceed at the address specified by the effective address, it is necessary for the user or his program to recompute the effective address of the HALT instruction and to use this address to start. Similarly, after an error during execution of a UUO followed by a START, DDT, CSTART, or REENTER command, .JBOPC points to the address of the UUO. For example, in DDT to continue after a HALT, type .JBOPC/10000,,3010 JRST @ . \$X

Table 10 (Cont.)
Job Data Area Locations
(for user-program reference)

Name	Octal Location	Description
.JBCHN	131	Left half: Zero or the address of first location after first FORTRAN IV loaded program. Right half: Address of first location after first FORTRAN IV Block Data.
.JBCOR	133	Left half: Highest location in low segment loaded with non-zero data. No low file written on SAVE or SSAVE if less than 140. Set by the LOADER. Right half: User argument on last SAVE or GET command. Set by the monitor.
.JBINT	134	Left half: Reserved for the future. Right half: Zero or the address of the error-intercepting block.
.JBOPS	135	Reserved for all operating systems.
.JBCST	136	Reserved for customers.
.JBVER	137	Program version number. The bits are defined as follows: <div style="margin-left: 40px;"> Bits 0-2 The group who last modified the program 0 = Digital development group. 1 = Other Digital employees. 2-4 = Reserved for customers. 5-7 = Reserved for customer's users. </div> <div style="margin-left: 40px;"> Bits 3-11 Digital's major version number. Usually incremented by 1 after a release. </div> <div style="margin-left: 40px;"> Bits 12-17 Digital's minor version number. Usually 0 but may be used if an update is needed after work has begun on a new major version. </div> <div style="margin-left: 40px;"> Bits 18-35 Edit number. Usually not reset. </div> The VERSION and the SET WATCH VERSION commands output the version number in standard format.
.JBDA	140	The value of this symbol is the first location available to the user.

NOTE: Only those JOBDAT locations of significant importance to the user are given in this table. JOBDAT locations not listed include those that are used by the monitor and those that are unused at present. User programs should not refer to any locations not listed above because such locations are subject to change.

Table 11
Vestigial Job Data Area Locations

Symbol	Octal Location ¹	Description
.JBHSA	0	A copy of .JBSA.
.JBH41	1	A copy of .JB41.
.JBHCR	2	A copy of .JBCOR.
.JBHRN	3	LH: restores the LH of .JBHRL, RH: restores the RH of .JBREN.
.JBHVR	4	A copy of .JBVER.
.JBHNM	5	High segment name set on a SAVE.
.JBHSM	6	A pointer to the high-segment symbols, if any.
	7	Reserved for future use.
.JBHDA	10	First location not used by vestigial job data area.

¹ Relative to origin of high segment, usually .JBHGH = 400000₈.

For additional information on the monitor calls, refer to DECsystem-10 Monitor Calls, DEC-10-MRRC-D.

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