DECsystem-10

Monitor Installation Guide

6.03 Monitor
June 1977

This manual describes the steps you must take to install the 6.03 monitor.

Digital Equipment Corporation. Maynard, Massachusetts

Revision: June 1977

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this manual.

The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.

Digital Equipment Corporation assumes no responsibility for the use or reliability of its software on equipment that is not supplied by DIGITAL.

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.

The following are trademarks of Digital Equipment Corporation:

DIGITAL	UNIBUS
DEC	DECsystem-10
PDP	DECtape
DECUS	DDT
KA10	KL10
KI10	

CONTENTS

PREFACE

This manual describes the steps you must take to install the 6.03 monitor. This manual should be used in conjunction with the DECsystem-10 Operator's Guide. Formerly, some of the information in this manual was found in various specifications within the DECsystem-10 Software Notebooks. For example, MONGEN is now Chapter 8 of this manual instead of being a separate specification.

When you receive your DECsystem-10, you will receive a Manufacturing tape labeled YURMON and the name of your installation. When you receive your 6.03 monitor, you will receive one 6.03 monitor tape and one CUSP tape. You also may receive tapes associated with unbundled products.

The files that make up the 6.03 monitor are listed below.

*.MAC	New monitor source files (complete except for unbundled files).
603.MCO	A description of the changes made to the monitor since the 6.02 monitor release.
603.DDT	A DDT patch file that can be applied to the monitor using the $Y feature of FILDDT to fix problems concerning 6.03. This file contains those patches listed in BWR603.RNO.
TOPA10.REL	The combined .REL files needed for loading a regular KA10 monitor.
TOPG10.REL	The combined .REL files needed for loading a KALUG monitor.
TOPI10.REL	The combined .REL files needed for loading a regular KI10 monitor.
TOPH10.REL	The combined .REL files needed for loading a KILUG monitor.
MONGEN.EXE	Version 50(135) of the Monitor Generation Program,

which is described in Chapter 8.

FGEN.HLP — Version 075 of FGEN.HLP, which lists and explains all the feature test switches that can be set via MONGEN.

CON???.CMD — The COMPIL command files that are needed for assembling monitors.

CMB???.CCL — The PIP indirect files needed for making TOP?10.REL.

BWR603.RNO — The BEWARE file for the 6.03 monitor, which contains information needed to load and use the 6.03 monitor. Read this file before you install the monitor.

BWR603.603 — The RUNOFF output from BWR603.RNO.

The above files constitute the standard 6.03 monitor release. In addition to the above, an installation will also receive any files associated with the unbundled portions of 6.03 that that installation is licensed to use.

The following are the unbundled portions of the 6.03 monitor, which are shipped only to properly licensed installations.

Virtual Memory
DAS78
DA28
DC44
Task to Task Communication

The installation procedures you use are basically the same regardless of which type of processor your system has (e.g., KA, KI, KL). Any differences in the installation procedure because of processor type are indicated within the text of this manual. Read the list below to determine which classification your installation is; then, start reading at the chapter number indicated.

Chapter	Classification
1	Generating a 6.03 monitor for a KL10 system at a new installation.
2	Generating a 6.03 monitor for a KA10 or KI10 system at a new installation.
4	Generating a 6.03 monitor for a KA, KI, or KL system with a currently running 6-series monitor.

CHAPTER 1

BUILDING THE FRONT-END FILE SYSTEM (KL10 ONLY)

The steps described in this chapter copy the front-end software from the RSX20-F DECtape to the front-end file space on the public disk. In performing the steps, you will be using the following front-end programs. These programs are on the RSX20-F DECtape that you will be copying onto the disk.

KLI	This program loads the KL10 microcode, initializes the KL10 caches, configures the KL10 memories, and loads a bootstrap program.
MOU (MOUNT)	This program adds (MOUnts) a device to the list of on-line front-end devices.
UFD	This program creates a directory in the front-end file system on the disk. This program does not respond with a prompt after you issue a command to it. Therefore, you must type a CTRL/backslash after typing the carriage return. Note that the CTRL/backslash does not echo.
INI	This program initializes the front-end file system. This program does not respond with a prompt after you issue a command to it. Therefore, you must type a CTRL/backslash after typing the carriage return. Note that the CTRL/backslash does not echo.
PIP	This program is a PDP-11 program that copies files from the DECtape to the disk. The PIP described in other chapters of this manual is the DECsystem-10 PIP.
RED (REDIRECT)	This program redefines the front-end logical name SY0: from the DECtape to the disk. This program does not respond with a prompt after you issue a command to it. Therefore, you must type a CTRL/backslash after typing the carriage return. Note that the CTRL/backslash does not echo.
SAV (SAVE)	This program saves the front-end monitor.

Device names used in this section are PDP-11 formatted device names. Table 1-1 lists the PDP-11 device names.

Table 1-1
PDP-11 Device Names

PDP-11 Name	Device
TT	Terminal
DT	DECtape
MT	Magtape
SY	DB0:[5,5], which is the PDP-11 system area that is used in the same way as DSKB:[1,4].
RF	Fixed-Head Disk
RP	Disk Pack
RK	Disk Cartridge
PR	Paper-tape Reader
PP	Paper-tape Punch
CD	Card Reader
LP	Line Printer
XY	Plotter

In addition to initially installing the front-end file system, you must install the front-end file system using the steps outlined in this Chapter if you ever do any of the following:

1. Reinitialize the front-end file system.

2. Change the front-end hardware.

3. Destroy the front-end file system.

The first step is to mount the DECtape labeled RSX20-F. Place the RSX20-F tape (version 0005J) on one of the front-end (PDP-11) DECtape drives. Make sure that the Unit Selector Switch is set to 0. This DECtape drive is called DT0 when you specify it by name.

On the right side of the Unit Selector Switch, set the rightmost button to REMOTE. Set the leftmost button (on the left side of the Unit Selector Switch that is set to 0) to WRITE ENABLE.

On the other DECtape drive, set the Unit Selector Switch to 1; mount the RSX20-F Auxiliary Files DECtape; set the switches for this drive (DT1) the same as you did for DT0.

Mount the manufacturing tape (labeled YURMON and your installation's name) on MTA0 (-10 device). If you are not a new installation and would like to create your own Manufacturing tape, follow the procedure listed below.

```
.GET SYS:BACKUP
.SAVE MTA0:BACKUP
.SAVE MTA0:BACKUP
.START
/TAPE MTA0:
/SAVE DSKB:[1,4]=DSKB:*.*[1,4]
```

The above procedure saves two copies of BACKUP and the [1,4] disk area (SYS:).

You can mount this magnetic tape on another magtape drive (other than MTA0); however, MTA0 is assumed in the following example. Mount a recently formatted disk pack on RPA0 (or another drive, but RPA0 is assumed). Whichever drive you choose, it must be dual-ported with the RH11.

To refer to the "-11" disk pack, you specify a device name in the following format:

```
DB unit-number:
```

where unit-number is 0-7. For example, RPA0 is the equivalent of DB0, RPA1 is the equivalent of DB1, an RPC3 is the equivalent of DB3.

Set the data switches on the -11 front panel to 000001. Make sure the ENABLE switch is on; then, push the SW/REG switch. The tape will begin loading. Refer to Table 14-1 for a description of what occurs when you press the SW/REG switch.

The following 'dialogue' takes place at the operator terminal between you, the front-end installer, and the system. Your responses are those underlined. Press the RETURN key after each response.

```
RSX-20F V005J 0:06 21-JUN-76

[SY0: REDIRECTED TO DT0:]
[DT0: MOUNTED]
KLI -- VERSION V002Q RUNNING

KLI -- MICROCODE VERSION 131 LOADED
KLI -- % NO FILE - ALL CACHE BEING CONFIGURED
KLI -- ALL CACHES ENABLED
KLI -- % NO FILE - ALL MEMORY BEING CONFIGURED
LOGICAL MEMORY CONFIGURATION:
                  CONTROLLER
ADDRESS  SIZE RQ0 RQ1 RQ2 RQ3 CONTYPE  INT
00000000 256K 04  FOR ALL      DMA20    4
KLI -- ? FILE 'DT0:BOOT.EXB;0'NOT FOUND
KLI -- ? BOOTSTRAP LOAD FAILED
KLI -- ENTER DIALOGUE [NO,YES,EXIT,BOOT]?
KLI> YES
KLI -- RELOAD MICROCODE  [YES,VERIFY,NO]?
KLI> NO
KLI -- RECONFIGURE CACHE  [FILE,ALL,YES,NO]?
KLI> NO
```

```
KLI -- CONFIGURE KL MEMORY  [FILE,ALL,YES,NO]?
KLI> NO
KLI -- LOAD KL BOOTSTRAP  [YES,NO,FILENAME]?
KLI> BOOTM
```

This example assumes you are booting from magtape.

The following is then printed at the operator terminal.

```
KLI -- BOOTSTRAP LOADED AND STARTED ;-10 BOOTSTRAP
BOOTM  V4(16)

BTM>
```

After the BTM> prompt, type in a command string terminated by a carriage return. After performing the command, the bootstrap loader either restarts itself or transfers to a newly loaded program, depending on the command you type. You can type either /TM02 or /TX01, depending on the tape drive used (e.g., for TU70s, type /TX01). Or, you could type a command in the following format:

```
structure:file.ext[project,prog]   /TM02
                                   /TX01
```

If you do not specify either /TM02 or /TX01, TM10 is assumed by default.

In this example /TM02 was typed.

```
BTM>/TM02
```

This response begins the loading of the default monitor (i.e., DSKB:SYSTEM.EXE[1,4] from drive 0 (MTA0) on the /TM02 magtape controller). (For more information on BOOTM refer to Chapter 18.) The following dialogue is then printed on the operator's terminal. You should type everything that is underlined. Refer to Chapter 3 for a more detailed description of this dialogue.

```
        RK275A KL10 SYS#1026 01-19-77
WHY RELOAD: SA   ;System is stand-alone; refer to Section 16.9
DATE: 21-JAN-77  ;Enter the current date
TIME: 710        ;Type the current time of day, using
                 ;a 24-hour clock.
STARTUP OPTION:  REFRESH
                 ;Specify the LONG startup
                 ;option if your installation is a new
                 ;installation or you are
                 ;using blank disk packs.
TYPE STR NAME TO BE REFRESHED (CR IF NONE, ALL IF ALL)
DSKB             ;The structure on which the front-end
                 ;file system is to be created.
                 ;Refer to Section 16.8 for
                 ;a description of the LONG
                 ;dialogue.
TO AUTOMATICALLY LOG-IN UNDER [1,2] TYPE "LOGIN"
```

```
.LOGIN
.RUN MTA0:BACKUP ;This executes the BACKUP
/TAPE MTA0:      ;program found on the manufacturing
                 ;tape. Refer to Chapter 17.
/RESTORE         ;Move files to SYSB
!                ;BACKUP's indication that it is busy.
"DONE
?BKPHSG CANNOT GET HIGH SEGMENT BACK  ;Ignore this
                                      ;error message.
```

Executing the following procedure creates a file called FE.SYS on RPA0 (DSKB) that will be used by the front-end for its file system.

```
.R FEFILE
DISK UNIT NAME:RPA0   ;UNIT WHERE DSKB is mounted.
SIZE OF FILE IN BLOCKS (<CRLF> GIVES DEFAULT OF 2000):

[2008 DATA BLOCKS ALLOCATED TO FE.SYS]
[FE.SYS AREA STARTS AT LOGICAL BLOCK 33041.]
[FRONT END FILE CREATED, HOM BLOCKS WRITTEN]

.K/F      ;To stop the -10 because the KL10
          ;must NOT be running
          ;while installing the
          ;front-end software.
```

NOTE

From now on, until you read otherwise, you are 'talking' only to the -11 front-end, using the -11 command language and -11 programs. The -10 is not involved in this communication process. The RESET command (in the example below) ensures that the -10 is not running.

To being communicating with the front-end command parser, type a CTRL/backslash (which does not echo). If at any time you type an incorrect response to the parser (i.e., after the prompt PAR%), type a CTRL/Z followed by a CTRL/backslash. The system retypes the prompt, after which you can retype your response. Note that some times a CTRL/backslash takes a few moments to respond.

```
^\             ;Type a CTRL/backslash.
PAR>SHUT
DECSYSTEM-10 NOT RUNNING
               ;K/F above kills your job.
               ;The SHUT command stops
               ;the -10.
^\             ;Type a CTRL/backslash.
PAR>SET CONSOLE MAINTENANCE
```

```
     CONSOLE MODE:  MAINTENANCE
     PAR%RESET      ;KL10 must not be running while installing
                    ;front-end software.
     PAR#ST MICROCODE ;Start microcode.
     PAR%MCR MOU    ;Start the MOUNT program in the front-end.
                    ;MCR is the front-end
                    ;command decoder.
     MOU>DT1:       ;Mount the tape labeled RSX20-F
                    ;Auxiliary files.
     MOU -- MOUNT COMPLETE
     MOU>^Z         ;Type a CTRL/Z.
     ^\             ;Type a CTRL/backslash
     PAR%MCR PIP    ;START PIP.

     PIP>TT:=DT0:/LI     ;Directory of DT0


     DIRECTORY DT0:[5,5]
     20-MAR-77 14:28

     F11ACP.TSK;41       77.     C  21-JUN-76 00:50
     PARSER.TSK;37       39.     C  21-JUN-76 00:50
     TKTN.TSK;45         6.      C  21-JUN-76 00:51
     MOU.TSK;37          5.      C  21-JUN-76 00:51
     SETSPD.TSK;41       4.      C  21-JUN-76 00:51
     KLR.TSK;37          5.      C  21-JUN-76 00:52
     KLE.TSK;37          23.     C  21-JUN-76 00:52
     KLX.TSK;43          5.      C  21-JUN-76 00:53
     KLI.TSK;46          33.     C  21-JUN-76 00:53
     UA.MCB;150          35.        21-JUN-76 00:53
     UB.MCB;150          35.        21-JUN-76 00:54
     BT128K.EXB;1        12.        16-MAR-77 10:09
     BT256K.EXB;1        12.        16-MAR-77 10:10
     BOOTM.EXB;2         34.        16-MAR-77 10:16

             TOTAL OF 325. BLOCKS IN 14. FILES

PIP>TT:=DT1:/LI



DIRECTORY DT1:[5,5]
20-MAR-77 14:31

RED.TSK;41          6.  C 21-JUN-76 00:07
SAV.TSK;40          12. C 21-JUN-76 00:07
DMO.TSK;37          5.  C 21-JUN-76 00:08
T20ACP.TSK;37       8.  C 21-JUN-76 00:08
UFD.TSK;37          9.  C 21-JUN-76 00:08
INI.TSK;37          23. C 21-JUN-76 00:08
PIP.TSK;1321        56. C 21-JUN-76 00:09
COP.TSK;2           8.  C 21-JUN-76 00:09

        TOTAL OF 161. BLOCKS IN 9. FILES
```

```
PIP>^Z
^\                  ;Type a CTRL/backslash.
PAR%MCR INI
INI>DB0:            ;Initialize the front-end file system on DB0.
^\                  ;Type a CTRL/backslash.
PAR%MCR MOU         ;Start MOUNT program.
MOU>DB0:            ;Mount the disk unit.
MOU -- MOUNT COMPLETE
MOU>^Z              ;Type a CTRL/Z.
^\                  ;Type a CTRL/backslash.
PAR%MCR UFD         ;Start the UFD program.
UFD>DB0:[5,5]       ;Creating the UFD called [5,5] on the
                    ;-11 disk area (FE.SYS);
                    ;see note below.
^\                  ;Type a CTRL/backslash.
PAR%MCR PIP         ;Start PIP.
PIP>DB0:=DT0:*.*,DT1:*.*  ;To copy all files from the
                          ;DECtape to the front-end file
                          ;system [5,5] on the disk pack on RPA0.
                          ;After approximately 35 minutes,
                          ;the system prints the PIP prompt.

PIP>DB0:BOOT.EXB=DT0: BT128K.EXB
                      BT256K.EXB
                ;This copies the BOOTS that
                ;fits your
                ;configuration.
PIP>^Z          ;Type a CTRL/Z.
^\              ;Type a CTRL/backslash.
PAR%
```

NOTE

FE.SYS is the logical -11 disk space area residing on the -10 disk (DSKB:[1,4],RPA0). FE.SYS contains -11 directory areas and files within these areas. Note that [5,5] is a directory area in FE.SYS.

You now reboot the front-end. Set the data switches on the -11 front panel to 000003. (Refer to Table 14-1.) Make sure the ENABLE switch is ON; then, push the SW/REG switch.

```
RSX-20F V00SJ 0:06 21-JUN-76

[SY0: REDIRECTED TO DT0:]
[DT0: MOUNTED]

^\              ;Type a CTRL/backslash to start the parser.
PAR%MCR MOU     ;Start the MOUNT program.
```

```
MOU> DB0:          ;Mount the disk unit that the -11
                   ;front-end file system (that you just
                   ;installed) resides on (DB0:).
MOU -- MOUNT COMPLETE
MOU>^Z             ;Type a CTRL/Z.
^\                 ;Type a CTRL/backslash
PAR%MCR RED        ;Start the REDIRECT program.
RED>DB0:=SY:       ;Make SY: be DB0: instead of DT0:.
                   ;This causes the KL10 to be rebooted from disk
                   ;instead of DECtape (-11 devices).
^\                 ;Type a CTRL/backslash.
PAR%MCR SAV        ;Start the SAVE program.
SAV>SY:/WB         ;Save the front-end monitor on
                   ;SY:(DB0:[5,5]).
                   ;The front-end can now use the files from
                   ;the TOPS-10 disk pack instead of the
                   ;PDP-11 DECtapes.
[DB0: DISMOUNTED]
[DT0: DISMOUNTED]


RSX-20F V005J 2:00 21-JUN-76  ;Messages from the SAVE program
[SY0: REDIRECTED TO DB0:]     ;to enable you to bootstrap
[DB0: MOUNTED]                ;from DB0: [5,5].
^\                  ;Type a CTRL/backslash.
PAR%MCR PIP         ;Start PIP.
PIP>TT:=DB0:/LI


DIRECTORY DB0:[5,5]
21-JUN-76 01:05


F11ACP.TSK;41       77.     C  21-JUN-76 00:30
PARSER.TSK;37       39.     C  21-JUN-76 00:31
TKTN.TSK;45         6.      C  21-JUN-76 00:32
MOU.TSK;37          5.      C  21-JUN-76 00:33
SETSPD.TSK;41       4.      C  21-JUN-76 00:35
KLR.TSK;37          5.      C  21-JUN-76 00:36
KLE.RSK;37          23.     C  21-JUN-76 00:37
KLX.TSK;43          5.      C  21-JUN-76 00:38
KLI.TSK;46          33.     C  21-JUN-76 00:39
UA.MCB;150          35.        21-JUN-76 00:41
UB.MCB;150          35.        21-JUN-76 00:43
BT128K.EXB;1        12.        21-JUN-76 00:44
BT256K.EXB;1        12.        21-JUN-76 00:46
BOOTM.EXB;2         34.        21-JUN-76 00:48
KL.CFG;1            1.         21-JUN-76 00:50
RED.TSK;41          6.      C  21-JUN-76 00:54
SAV.TSK;40          12.     C  21-JUN-76 00:55
DMO.TSK;37          5.      C  21-JUN-76 00:56
T20ACP.TSK;37       8.      C  21-JUN-76 00:57
UFD.TSK;37          9.      C  21-JUN-76 00:58
INI.TSK;37          23.     C  21-JUN-76 00:59
PIP.TSK;1321        56.     C  21-JUN-76 01:00
```

```
COP.TSK;2           8.      C  21-JUN-76 01:01

        TOTAL OF 453. BLOCKS IN 23. FILES

PIP>^Z     ;Type a CTRL/Z.
```

At this point, RSX20-F can be bootstrapped from the disk by depressing the switch labeled DISK or, if the front-end disk pack is on a drive other than RPA0, depress the SW/REG switch. Refer to Chapter 2.

From now on devices and directories specified are DECsystem-10 devices and directories; unless specified otherwise.

CHAPTER 2

READIN BOOTM

READIN the BOOTM bootstrap and your 6.03 monitor from the new installation bootstrap tape.

If you have a KL10 system, read Steps 1 and 2. If you have a KA or KI system, read Steps 3 through 7.

STEP 1 (KL10 only)

Set the ENABLE/DISABLE load switch to ENABLE. This will enable the other three load switches.

STEP 2 (KL10 only)

Press the upper half of the switch labeled DISK on the KL10 front panel. This will cause the front-end processor to access the disk on drive 0 and load the RSX20-F monitor.

The KL10 initialization program (KLINIT) is automatically loaded, and the default hardware configuration of cache and external memory are also automatically set up. The bootstrap program (BOOTS) for the TOPS-10 monitor is then automatically loaded into the central processor and started. The following is an example of the output you will receive on the console terminal. You type everything that is underlined.

```
RSX-20F V005J 0:16 21-JUN-76

[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]
KLI -- VERSION V002J RUNNING
KLI -- MICROCODE VERSION 131 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION
                  CONTROLLER
ADDRESS  SIZE  RQ0  RQ1  RQ2  RQ3  CONTYPE  INT
00000000 256   04   FOR  ALL        DMA20    4
KLI -- BOOTSTRAP LOADED AND STARTED
BOOTS  V22(103)
BTS>
^\     ;Type a CTRL/backslash.
```

```
PAR>MCR KLI
KLI -- VERSION V0002J RUNNING
KLI -- ENTER DIALOGUE [NO,YES,EXIT,BOOT]?
KLI -- YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI> NO
KLI> RECONFIGURE CACHE [FILE,ALL,YES,NO]?
KLI> NO
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI> NO
KLI -- BOOTSTRAP [YES,NO,FILENAME]?
KLI> BOOTM
KLI -- ALL CACHES ENABLED
KLI -- BOOTSTRAP LOADED AND STARTED
BOOTS   V4(16)
BTS>
```

If an error occurs during the KL initialization program, you will receive an error message preceded by KLI --?. At that point, you are placed in KLINIT dialogue mode which is described in Appendix A of the KL Series Operator's Guide. BOOTS outputs the prompt BTS>. After BOOTS prints its prompt, you must type a file specification, indicating the monitor you want to read from the BACKUP save set on the Manufacturing Bootstrap Tape. Type the following command line:

```
DSKB:  YURMON.EXE[1,4]
```

This response begins the loading of the monitor from the Manufacturing BOOTSTRAP tape. Then, the ONCE-Only Dialogue starts. Turn to Chapter 4.

STEP 3 (KA/KI Only)

Mount a recently formatted disk pack on a disk drive. For example, RPA0.

STEP 4 (KA/KI only)

Mount the 6.03 Manufacturing Bootstrap tape containing your monitor on MTA0, which is write-locked. Drive 0 is required for READIN with TM10 controllers. On TU70's the tape must be mounted on the lowest numbered ready drive.

If you are not a new installation and you would like to create your own manufacturing tape, follow the procedure listed below.

```
.GET SYS:BACKUP
.SAVE MTA0:BACKUP
.SAVE MTA0:BACKUP
.START
/TAPE MTA0:
/SAVE DSKB:[1,4]=DSKB:*.*[1,4]
```

The above procedure saves two copies of BACKUP and the [1,4] disk area (SYS:).

STEP 5 (KA/KI only)

For a TM10 controlled magtape set the READIN switches to 340. For a TU70, set the READIN switches to 220.

STEP 6 (KA/KI only)

In order, press the STOP and RESET switches and set the NXM switch off; then, press READIN. The tape rewinds and reads in the BOOTM bootstrap, which then allows you to specify and start the 6.03 monitor.

STEP 7 (KA/KI Only)

BOOTM outputs the prompt characters BTM>. After BOOTM prints its prompt, you must type a file specification, indicating the monitor you want to read from the BACKUP save set on the 6.03 Manufacturing Bootstrap tape. Type the following command line:

```
DSKB:  yurmon.EXE[1,4] /TM02
                       /TX01
```

where: yurmon is the name given to your monitor.

You must specify the tape control unit: either TM02 or TX01. The default, if you do not specify a unit, is TM10.

The command line format to be typed to BOOTM is described in Chapter 19.

This response begins the loading of the default monitor on the 6.03 Manufacturing Bootstrap tape. The following dialogue is then printed on the operator's terminal. You should type everything that is underlined. Refer to Chapter 3 for a more detailed description of this dialogue.

```
          RK277 KI10 SYS#514 2-15-77
WHY RELOAD:SA            ;System is stand-alone; refer to Section
                         ;16.9.
DATE:  21-FEB-77         ;Enter the current date
TIME:  7:10              ;Type the current
                         ;time of day, using a 24-hr. clock.
STARTUP OPTION:REFRESH   ;Specify the LONG startup
                         ;option if your
                         ;installation is a
                         ;new installation or
                         ;you are using blank
                         ;disk packs.
TYPE STR NAME TO BE REFRESHED (CR IF NONE, ALL IF ALL)
DSKB                     ;The structure on
                         ;which the monitor
                         ;is to reside.
                         ;Refer to Section 16.8
                         ;for a description of the
```

```
                              ;LONG Dialogue.

     TO AUTOMATICALLY LOG-IN UNDER [1,2] TYPE "LOGIN"
     .LOGIN
     .RUN MTA0: BACKUP        ;This executes the BACKUP
                              ;program found on the
                              ;manufacturing
                              ;magtape. Refer to
                              ;Chapter 17.

     /TAPE MTA0:
     /RESTORE                 ;Move files to DSKB[1,4]
     !                        ;BACKUP's indication
                              ;that it is busy.
     "DONE
     ?BKPHSG CANNOT GET HIGH SEGMENT BACK

                              ;Ignore this error
                              ;message.
```

Now, turn to Chapter 4.

CHAPTER 3

START THE MONITOR

This chapter briefly describes the system start-up dialogue, which appeared in the examples in Chapters 1 and 2.

You can start your monitor with the LONG startup option and refresh the disks. If your disks have already been formatted and refreshed, respond with the NOINITIA startup option. Note that disk packs must be formatted by a Field Service formatting program, before you can attempt to use them with a monitor.

The LONG START-UP Option is not described in this chapter. The Start-Up Options are a portion of the ONCE-Only dialogue, which is completely described in Chapter 16.

STEP 1

The ONCE-Only dialogue begins between you and the system. ONCE types:

```
SYSCHK (Y,N):
```

If you type Y in response, the system will run a 5-second diagnostic program that ensures the accessibility of all configured memory and system devices. A reply of N or a carriage return skips the execution of the diagnostic program.

STEP 2

ONCE then types the system name (which was specified in MONGEN refer to Section 8.4, question number 4) followed by the monitor creation date. For example:

```
LOAD 3 SYS#10 KL 02-1-77
```

When ONCE prints the following:

```
WHY RELOAD:
```

reply with NEW and press the carriage return. Instead of responding with NEW, you can respond with one of the below:

```
OPR         NXM     CM
```

```
PARITY      HALT    SA
POWER       LOOP    SCHED
STATIC      HUNG    OTHER
HARDWARE    PM
```

If you do not reply within 60 seconds, OTHER is assumed.

STEP 3

ONCE prompts with:

```
DATE:
```

after which you type the current date; for example: 1-MAR-77. ONCE then prompts with:

```
TIME:
```

after which you type a 4-digit number indicating the current time, using a 24-hour clock. For example: 2015, indicating 8:15 PM.

STEP 4

ONCE prompts with:

```
STARTUP OPTION:
```

after which you respond with LONG if your disks have not been refreshed. Otherwise, respond with NOINITIA. The NOINITIA option responds with a . and you must LOGIN as a [1,2] job.

The LONG startup option allows you to explicitly set all system parameters and to refresh and restructure the file system in a non-standard way.

The ONCE dialogue, including the LONG startup dialogue is described in Chapter 16.

CHAPTER 4

RESTORE SELECTED FILES

Before reading this chapter, make sure you are using the latest field image version of BACKUP. If you are a new installation and you have just gotten BACKUP from the Manufacturing Bootstrap tape, you should have the correct BACKUP version. If you have been running a TOPS-10 monitor, be sure you have the proper version of BACKUP on SYS:. Verify that the version number is the latest by checking it against the software version number in the most recent DECsystem-10 DISPATCH/BULLETIN.

To install a 6.03 monitor, certain monitor files must be restored at 800 bits/inch from the standard distribution tapes and from the unbundled distribution tapes. The [10,7] area is used in these instructions to designate the restore area. But, another project-programmer number can be substituted for [10,7]. Normally, these files are restored to the structure DSKB. However, if your system does not have a DSKB, BACKUP can be restored to any designated file structure. (Refer to Chapter 17.)

To simplify the restore process, you should restore files on the monitor tape in the order they appear on the distribution tape. Files on the monitor tape are normally in alphabetical order. To find out the appropriate order, print a directory of the tape on the line printer. To do so, type the following command lines.

```
.START
/REWIND
/DENSITY 800
/PRINT LPT
```

The number of files you should restore from the monitor distribution tape to the disk is determined by the amount of disk space you have available. The instructions for three different situations are given below:

1. If your installation has slightly more than 20,000 free disk blocks

2. If your installation has about 10,000 free disk blocks

3. If your installation has very few free disk blocks.

If you have enough disk space available, you should also restore all the files from other distribution tapes using the appropriate project-programmer number. Otherwise, you may need to selectively restore certain files, because you may need some unbundled files for your monitor. Also, some of the utility programs, assumed to be on the monitor distribution tape in the instructions below, may be on the language distribution tape because of changes in the packaging procedure.

1. If your installation has slightly more than 20,000 free blocks of disk space, you can restore all files on the 6.03 monitor distribution tape. In this case, the latest versions of all files are available for use, and you need not worry about selectively restoring individual files.

   The procedure below should be followed, first for the CUSP tape, then for the 6.03 monitor distribution tape, and last for each of your unbundled tapes, if you have any.

   To restore all files, ensure that the tape is mounted properly and type to BACKUP:

```
.R BACKUP
/REWIND
/INTERCHANGE
/DENSITY 800
/RESTORE[10,7]*.*=PIP.EXE
"DONE
/REWIND
/SUPERSEDE ALWAYS
/INTERCHANGE
/RESTORE[10,7]*.*=*.*
"DONE
```

   The purpose of restoring PIP.EXE separately is to protect yourself. If the disk fills up, you will need PIP to delete files and then continue restoring. Because all of the installation batch control files assume that the field image files are in [10,7], we recommend your using that project-programmer number.

   If you attempt to restore all files and receive the error message

```
?LOOKUP/ENTER FAILURE (14)
```

   indicating that the disk storage capacity has been exceeded, you must restore only selected files as described in situation 2, which follows.

   After restoring all the files, you should print the .DOC .MAN, .RND, .RNH and .RNO files. They contain useful program documentation. The .RND, RNH, and .RNO files must first be expanded with RUNOFF by typing:

```
.RUN DSK:RUNOFF[10,7]

*filename

*^C
```

   All .RND files become .DOC files, all .RNH files become .HLP files, and all .RNO files become .MEM files after they have been through RUNOFF.

2. If your installation has about 10,000 free blocks of disk space, you can restore all monitor-related files to the disk. These files enable you to build and start the monitor, to assemble all monitor source files, to make modifications with SOUP, and to obtain monitor listings.

   To build the monitor you must determine which type of monitor is best for your configuration and then choose the

appropriate .CMD file for your system. (See Chapter 10.) After selecting the file, you should restore it and PIP.EXE using BACKUP. In the example below, the .CMD file for the standard KI configuration is used. Type to BACKUP:

```
/REWIND
/INTERCHANGE
/DENSITY 800
/SUPERSEDE ALWAYS
/RESTORE[10,7]*.*=CONKI.CMD,PIP.EXE
"DONE
/^C
```

Then, list the contents of CONKI on your terminal using PIP.

Type:

```
.RUN PIP[10,7]

*TTY:=CONKI.CMD[10,7]
*^C
```

The monitor related files are printed on your terminal.

Then restore all files printed on your terminal with the extension .MAC, excluding F???.MAC, HDW???.MAC, TTY???.MAC, and NET???.MAC, because you must generate these files with MONGEN, which is described in Chapter 8. There is no need to repeat files that are duplicated on the TTY listing. Also, in lines containing an equal sign, only files to the right of the equal sign need to be restored. For example, for the line,

```
COMDEV.RLI=HDWKI.MAC+TTYKI.MAC+NETKI.MAC+COMDEV.MAC
```

restore only COMDEV.MAC. These files are for the standard KI monitor, determined by the imbedded 'KI.'

The procedure below should be repeated for the CUSP tape, then for the 6.03 monitor distribution tape, and last for each of your unbundled tapes, if you have any.

To restore the necessary files, type:

```
.RUN DSK:BACKUP[10,7]

/REWIND
/INTERCHANGE
/DENSITY 800
/SUPERSEDE ALL
/RESTORE[10,7]*.*= filenames (separated by commas)
```

where filenames include BWR603.RNO, COMDEV.MAC, COMMOD.MAC, COMMON.MAC, MONGEN.EXE, S.MAC, WBOOT.EXE, the appropriate TOP?10.REL file, and necessary .MAC files from the .CMD file. Note that these files are distributed on the 6.03 monitor distribution tapes.

where filenames include COMPIL.EXE, FGEN.HLP, FILEX.EXE, LINK.EXE, LNKSCN.EXE, LNKLOD.EXE, LNKMAP.EXE, LNKXIT.EXE, LNKERR.EXE, LNK999.EXE, MACRO.EXE, and RUNOFF.EXE. Note that these files are on the CUSP tape.

If you are building a monitor from scratch, also restore the

following files.

```
/RESTORE[10,7]*.*=LOGIN.EXE,LOGOUT.EXE,REACT.EXE
```

If you have any unbundled distribution tapes (e.g., virtual memory), these tapes must be restored at this time. Refer to Chapter 10 for a list of the file names contained on the unbundled distribution tapes.

It is recommended that you restore and print copies of .DOC, .MAN, .RND, .RNH, and .RNO files if there is sufficient space. They contain useful program documentation. The .RN? files must be expanded with RUNOFF by typing:

```
.R RUNOFF

*filename

*^C
```

All .RND files become .DOC files, all .RNH files become .HLP files, and all .RNO files become .MEM files after they have been run through RUNOFF.

3. If your installation has very few free disk blocks, selectively restore only essential monitor building files. With the minimum number of files, you can only build and start the monitor. You cannot assemble all monitor source files and you cannot merge your modifications with SOUP. You may want to free additional disk space to perform these functions.

   To restore only the essential files, mount the 6.03 monitor tape and follow the procedure below to restore the necessary files:

```
.R BACKUP
/REWIND
/INTERCHANGE
/DENSITY 800
/RESTORE[10,7]*.*=BEWARE.603,COMMOD.MAC
/RESTORE[10,7]*.*=COMMON.MAC,COMDEV.MAC,COMPIL.EXE
/RESTORE[10,7]*.*=FGEN.HLP,BACKUP.EXE, MONGEN.EXE
/RESTORE[10,7]*.*=PIP.EXE,S.MAC,TOP?10.REL,W?BOOT.EXE
"DONE
/^C
```

   Then mount the CUSP tape and follow the procedure below to restore the necessary files:

```
.START
/REWIND
/INTERCHANGE
/DENSITY 800
/RESTORE[10,7]*.*=BACKUP.EXE,FILEX.EXE
/RESTORE[10,7]*.*=LINK.EXE,LNKSCN.EXE
/RESTORE[10,7]*.*=LNKLOD.EXE,LNKMAP.EXE
/RESTORE[10,7]*.*=LNKXIT.EXE,LNKERR.EXE
/RESTORE[10,7]*.*=LNK999.EXE,MACRO.EXE
/RESTORE[10,7]*.*=PIP.EXE
"DONE
/^C
```

   where TOP?10.REL is the specific .REL file needed for your

configuration. (See Chapter 9.)

If you are building a 6.03 monitor from scratch, also restore the following files:

```
/RESTORE[10,7]*.*=LOGIN.EXE,LOGOUT.EXE,REACT.EXE
```

If you have any unbundled distribution tapes (e.g., virtual memory), these tapes must be restored at this time. Refer to Chapter 10 for a list of the file names contained on the unbundled distribution tapes.

It is very important that you print and read the last minute documentation file. You can simply list or print BEWARE.603 or, assuming the files BWR603.RNO and RUNOFF.EXE have been restored from the tape, expand the RUNOFF file and then print it.

Expand the file with RUNOFF by typing:

```
.RUN DSK:RUNOFF[10,7]

*filename

*^C
```

All .RNO files become .MEM files after they have been run through RUNOFF.

CHAPTER 5

COPY MONITOR SUPPORT PROGRAMS

If your installation is running a current monitor, you should install monitor support programs prior to building the 6.03 monitor. If you have not previously installed the latest versions of monitor-related programs, or you are building the 6.03 monitor from scratch, you must now copy monitor support programs to SYS with PIP. Note that ACCT.SYS must be on SYS or you will not be allowed to LOGIN. You should log in under [1,2] and type:

```
.RUN DSK:PIP[10,7]

*SYS:<155>/X=DSK:[10,7]filename,...
```

where filenames include:

```
DDT.REL,JOBDAT.REL,*.EXE,*.ATO
*.VMX (for virtual memory monitors only;  it is on the VM
       unbundled tape)
```

Some of the files may also have to be copied from [10,6].

Also, if you do not have your system accounting files built, copy *.SYS specifying protection <157>.

If your installation has file structures of different speeds, put the following files on the fastest structure (DSKA):

```
DDT.REL,FORLIB.REL,BASIC.EXE,LIBOL.REL (if using
nonreentrant COBOL)
```

You may want to put the following files on every file structure:

```
SYSTAT.EXE,REDALL.EXE,DSKRAT.EXE,DSKLST.EXE,
BACKUP.EXE
```

because they are needed to track down possible disk hardware problems.

CHAPTER 6

WRITE BOOTS

You now must write BOOTS on disk packs with WTBOOT. WTBOOT is a generic name for WABOOT, WIBOOT, and WLBOOT, where the second letter (A,I,L) corresponds to your system processor (KA,KI,KL).

This step is required on all systems to write the latest version of BOOTS onto the disk packs.

WTBOOT can write BOOTS, a disk bootstrap loader program, on blocks 0 and 4 through 7 of all disk packs in the system. Run WTBOOT, WABOOT, WIBOOT, or WLBOOT once, the first time a new 6-series monitor is built. It is necessary to run WTBOOT again only if the disks are reformatted or if there is a new BOOTS. BOOTS should be written on each disk pack so that the crash procedure works.

When writing BOOTS on disk packs for a KL10 system with 6.03, it is important that you use the WLBOOT distributed with the 6.03 monitor. This is important because previous versions of WLBOOT wrote in block 0 of the disk pack, which contains the front-end file system. Writing in block 0 wipes out the front-end bootstrap.

To run WTBOOT log in to [1,2] and type:

```
.R W?BOOT
```

W?BOOT responds with:

```
SELECT UNITS?
```

where you respond with NO or YES. If you respond with NO, the default BOOTs will be written on all disk packs. If you are using a KL10, W?BOOT will not write the READIN loaders. If not using a KL10, W?BOOT will write the default READIN loader on all RS04s and RP0xs. Note that RP0x indicates RP04, RP05, or RP06.

If you respond with YES, W?BOOT responds with:

```
UNIT unit-name
```

You are to respond with the type of BOOTs you want written on each type of unit in the system. You respond with DP, RP, R2, ZERO, or SKIP.

DP writes RP02/RP03 BOOTS on the pack mounted on that unit.

RP writes RH10/RP0x BOOTS on the pack mounted on that unit.

R2 writes RH20/RP0x BOOTS on the pack mounted on that unit.

ZERO prevents the monitor from reading BOOTS from the pack

mounted on that unit.

SKIP prevents W?BOOT from changing the pack mounted on that unit.

If you respond with a carriage return, W?BOOT writes the default BOOTS. The default is RP02/RP03 BOOTS on RP02/RP03 packs, RH10/RP0x BOOTS on RP0x packs (i.e., RH10s), RH20/RP0x BOOTS on RH20 packs. For each RS04 or RP0x, W?BOOT asks you if the READIN loader should be written in 18- or 22-bit mode format. You respond with NONE, 18, 22, or carriage return.

NONE if no READIN loader should be written on block 0 (KL10).

22 if the DF10C is normally in 22-bit mode format.

18 if the unit is not on a controller connected to a DF10C, or if the DF10C is normally in 18-bit mode format.

CR for the default response, which is 18-bit mode on even units and 22-bit mode on odd units.

When the procedure is completed, the system responds:

```
EXIT
```

Note that WTBOOT writes BOOTS only on disk packs that are on line and not write locked. (For more information on BOOTS, or on loading BOOTS with a paper tape, refer to the DECsystem-10 Operator's Guide in the DECsystem-10 Software Notebooks.)

CHAPTER 7

MERGE MODIFICATIONS

Omit this step if you are building an unmodified DEC monitor and do not intend to merge any modifications developed at your installation.

SOUP (Software Updating Package) is a set of programs used to update source files. It is designed to simplify the merging of customer modifications with DEC-supplied files.

The DECsystem-10 Software Updating Package Programmer's Reference Manual in the DECsystem-10 Software Notebooks describes in detail the set of programs in the SOUP package and explains how to use them. If you have several modifications to be merged with many source files, you may use the DECsystem-10 Software Notebook document entitled SOUPing Parallel Monitor Developments Together (MULTI) as a guide.

NOTE

Use of SOUP requires that the appropriate source (.MAC) files have been restored from the distribution tape.

Be very familiar with SOUP before attempting to use it.

CHAPTER 8

GENERATE A MONITOR WITH MONGEN

8.1 INTRODUCTION

The Monitor Generator (MONGEN) is a dialogue program enabling you to choose the software most appropriate for your installation and to define your hardware configuration.

The dialogue produces the files needed to build the monitor, and it then tailors them to your system configuration. Parameter assignments within these files determine how the monitor data base modules are assembled. The dialogue consists of questions typed by MONGEN on your terminal and your answers followed by a carriage return.

Before running MONGEN, you should

1. Become acquainted with the current version of the MONGEN dialogue.

2. Be thoroughly familiar with your system configuration.

3. Know what changes you wish to make to the monitor currently running.

8.2 MONGEN ORGANIZATION

The MONGEN dialogue is divided into four sections, each asking questions about a specific aspect of the system configuration. The four sections are:

HDWGEN — which defines the system hardware configuration (Section 8.4)

TTYGEN — which defines the system terminal configuration (Section 8.5)

NETGEN — which defines the system network configuration (refer to Section 8.6)

FGEN — which defines the system software features and options (Section 8.7)

The first time you generate the files for a new monitor, you should answer the questions in each of the four sections. On subsequent occasions, you can change only one, two, or three of the four sections. The number of sections you change depends on where your changes are and which section(s) your changes affect. You need only answer the questions in the section you are changing.

After you answer the questions for the four sections of MONGEN, four files will be generated - - HDWCNF.MAC, TTYCNF.MAC, NETCNF.MAC, and F.MAC. These are the default names of the files containing your MONGEN dialogue. You may change these file names by responding to question number 2 in HDWGEN, TTYGEN, NETGEN, and/or FGEN.

If, after generating the four files, you wish to redefine one of them, you can reanswer the questions for that section. Then,you can assemble this new file along with the other three.

In this chapter, each MONGEN question is described within its appropriate section.

8.3 EXECUTING MONGEN

To execute the version of MONGEN on SYS:, type the following command:

```
R MONGEN
```

To execute the version of MONGEN on your disk area, type the following command:

```
RUN MONGEN
```

MONGEN will respond with

```
MONGEN FOR 603 MONITORS
/HELP(PROMPT,SHORT,LONG):
```

MONGEN wishes you to indicate which one of the three following dialogue modes you wish to use.

MODE	EFFECT
SHORT	MONGEN types only abbreviated questions on your terminal. This mode assumes that you need no explanation of the question and that you are familiar with the choice of answers. SHORT mode is recommended only for experienced users of this version of MONGEN.
PROMPT	MONGEN types the same abbreviated question as in SHORT mode, but adds, within parentheses, a choice of answers. (Note that the first item within the parentheses is the default answer.) This mode is recommended for users familiar with the MONGEN dialogue, but who would prefer to have the choice of answers typed with each question.
LONG	MONGEN types the question, the choice of answers within parentheses, and an explanation of the question within square brackets. This mode is recommended for all first time users of this version of MONGEN.

The mode you choose will be used throughout the dialogue. To change modes during a MONGEN dialogue, answer a question by typing

```
/HELP
```

This answer will change the mode to the next longest, but only for the current question. To change modes for the rest of the dialogue, type

```
/HELP:x
```

where x is either SHORT, PROMPT, or LONG (abbreviated S, P, or L).

8.3.1 MONGEN Dialogue Format

MONGEN questions and responses are in the form:

question(possible answers) [explanation]:answer

The possible answer portion of this format description is usually in one of the following forms:

(min-max)	Legal range
(default,min-max)	Default response followed by legal range
(Y,N)	Yes or No
(a,b,c, ... z)	Multiple choice

Type your response directly after the colon. When you finish press the RETURN key. If you want the default response, press the RETURN key immediately after the colon. Because of the nature of some MONGEN questions, possible answers are not offered.

Answers to questions requesting consecutive TTY line number identification can be typed on one line. For example:

1-10	specifies TTY line numbers 1 through 10.
13	specifies TTY line number 13.
22-24	specifies TTY line numbers 22 through 24.

If you type an illegal or inappropriate response, MONGEN will type an error message after which you may respond to the question again. The possible error messages are listed in Section 8.19.

8.3.2 Generating a New Monitor

After typing the command R MONGEN and after you respond to the /HELP question, MONGEN will type

1^1 WHICH GEN (HDW, TTY, NET, F):

Respond with either HDW, TTY, NET, or F to indicate which section you wish to configure. For example, if you respond with HDW, MONGEN will start typing the HDWGEN questions. When the HDWGEN MONGEN dialogue has been completed, question number one will be retyped requesting you to type another section name.

---

1. Note that all questions within this document are preceded with a number. These numbers are used for reference only; they are not printed by MONGEN.

8.4 HDWGEN

HDWGEN is the section containing questions about the central processor(s), disklike storage devices, real-time devices, and peripheral devices.

2 OUTPUT (DSK:HDWCNF.MAC):

If you accept the file HDWCNF.MAC and device DSK: as the media for storing your answers to MONGEN, press the return key. If you do not accept them, type your preferred device name, file name, and project/programmer number.

3 DECSYSTEM10 (1040,1050,1055,1070,1077,1080,1088):

Respond with the type of system you are configuring.

Type of System	Response
KA10 CPU (small)	1040
KA10 CPU (large)	1050
dual-KA10 CPUs	1055
KI10 CPU	1070
dual-KI10 CPUs	1077
KL10 CPU	1080
dual-KL10 CPUs	1088

4 SYSTEM NAME:

Respond to this question with your system name in 24 characters or less. This system name is the 'banner' printed when you issue the INITIA command. For example, KG77A KL10 #1026.

5 CPU0 SERIAL # (1-10000):

Respond with CPU0's serial number, which falls into the range 1 to 10000. MONGEN will repeat this question once for each processor in your system.

5A CPU1 SERIAL #(1-10000):

Respond with CPU1's serial number, which falls into the range 1 to 10000. (This question is typed only if you specified in question 3 that you have a dual-processor system.)

6 # DK10'S ON CPU0 (1,0-2):

If your processor is a KL10, this question will not be typed unless you answer N to question 8. Respond with the number of DK10 real-time clocks for CPU0. The default number is one; the maximum is two. (The DK10 real-time clock keeps time in units of 10 microseconds.) If you have a dual processor system, this question will be repeated.

6A # DK10'S ON CPU1 (1,0-2):

Respond with the number of DK10 real-time clocks for CPU1. (This question is typed only if you specified in question 3 that you have a dual-processor system.)

7 EXCLUDE MONITOR OVERHEAD FROM USER RUN TIME (Y,N):

Answer Y (Yes) or N (No). The answer to this question is independent of whether time accounting is performed with the line frequency clock (50 or 60 Hertz) or the real-time clock (100000 Hertz). If you respond with Y, users will receive a more accurate accounting of their processor usage, because user runtime is reported independent of system loading. However, all installations that charge their customers for processor usage should be aware that the exclusion of monitor overhead will decrease the reported user runtime by 10 to 30 percent.

If you respond with N, monitor overhead will be included in run-time statistics. Whether you respond with Y or N to this question, monitor overhead will be reported as a separate statistic that may be used by the system manager in determining the amount of CPUtime spent for overhead.

With EBOX/MBOX accounting (KL10 systems only), meters are turned off at the beginning of the overhead period and turned on again at the end. If your system is not a KL10 (1080 series), jump to question number 10.

8 EBOX/MBOX TIME ACCOUNTING (Y,N):

This question is typed only if you responded to question number 3 with 1080 (1088, 1090, 1099). Answer Y or N. If you respond with Y, run-time accounting will be computed using the KL10 internal clocks and question number 9 will be typed. If you respond with N, the next question typed will be question number 6. For maximum user run-time reproducibility, you should answer Y to both this question and question number 9.

9 EXCLUDE PI TIME FROM USER RUN TIME (Y,N):

This question is typed only if you responded with 1080 to question number 3 and Y to question number 7. Answer Y or N. If your response is Y, the EBOX and the MBOX accounting clocks will be stopped whenever a Priority Interrupt is in progress. For maximum user run-time reproducibility, you should answer Y to both this question and question number 8.

10 HIGH PRECISION TIME ACCOUNTING (Y,N):

This question is typed only if you responded to question 6 and/or question 6A with a value equal to or greater than 1. Answer Y or N to this question. If Y, more precise run-time measurements will be given because the system will use 10-microsecond time accounting. This will more accurately reflect real CPU-time, independent of context switching. (Therefore, a compute-bound job is not charged for a whole 60th of a second, even though an I/O-bound job ran during that time interval.) If N, question number 11 will be typed.

11 DK10 SOFTWARE (Y,N):

This question is typed only if you responded with N in response to question number 10 and a value greater than or equal to 1 in response to question number 6 and/or question number 6A. To include the real-time clock service routine, answer Y; to omit it, answer N. This device is not available to a user program unless it issues an RTTRP monitor call. The service routine is used only for high-precision time accounting.

12 # DATA CHANNELS (2,1-8):

Respond with the number of data channels in your system (DF10s, DF10Cs, DX10s, or RH20s for disk or tape). The default is 2; the maximum is 8.

NOTE

Questions 13 through 23 are repeated once for each data channel you specified in response to question 12.

13 CHANNEL n TYPE (DF10,DF10C,DX10,RH20):

Respond with the type of channel n (DF10,DF10C or DX10). This question is asked once for each data channel that you specified in response to question number 12. If you respond with DF10 or DF10C, read questions 14 through 20B. If you respond with DX10, read questions 21 and 21A. If you respond with RH20, read questions 22 through 23B.

Note that channel n corresponds to the first, second, third ... channel you configure. The n does not necessarily correspond to a hardwired channel number.

14 # RC10S (0-2):

Respond with the number of controllers for the RD10 Burroughs disk and RM10B Bryant drums on channel number n. If you respond with 0, question number 14A will not be printed.

14A # UNITS ON FHx (1-4):

This question is repeated n times (where n is your response to question number 14.) Each time the question is typed, x will be incremented to the next alphabetic in sequence starting with A (e.g., FHA, FHB,...). Respond with the number of disks and/or drums associated with controller FHx.

15 # RH10S FOR RS04'S (0-3):

Respond with the number of controllers for the RS04 swapping disks on channel number n. If you respond with 0, question number 15A will not be typed. Both RS04 and RP04 disk units have RH10 controllers; RS04s have the lower device codes between the two.

15A # UNITS ON FSx (1-8):

This question is repeated n times (where n is your response to question number 15). Each time the question is typed, x will be incremented to the next alphabetic in sequence starting with A (e.g., FSA, FSB,...). Respond with the number of swapping disks associated with controller FSx on channel n.

16 # RH10S FOR RP04'S (0-3):

Respond with the number of controllers for RP04 and RP06 disk pack units on channel number n. If you respond with 0, question number 16A will not be typed. Both RS04 and RP04 disk units have RH10 controllers; RS04s have the lower device codes of the two.

16A # UNITS ON RPx (1-8):

This question is repeated n times (where n is your response to question number 16). Each time the question is typed, x will be incremented to the next alphabetic in sequence starting with A (e.g., RPA, RPB,...). Respond with the number of disk packs associated with controller RPx.

17 # RP10S(0-3):

Respond with the number of controllers that are in the system for RP02 and RP03 disk pack units on channel number n. If you respond with 0, question number 17A will not be typed.

17A # UNITS ON DPx (1-8).

This question is repeated n times (where n is your response to question number 17). Each time the question is typed, x is incremented to the next

alphabetic in sequence starting with A (e.g., DPA, DPB,...). Respond with the number of disk pack units associated with controller DPx.

18 # TM10BS (0-2):

Respond with the number of controllers that are in the system for NRZI-only drives on channel n. If you respond with 0, question number 18A will not be typed.

18A # UNITS ON MTx (1-8):

This question is repeated n times (where n is your response to question number 18). Each time this question is typed, x is incremented to the next alphabetic in sequence starting with A (e.g., MTA, MTB,...). Respond with the number of magtape units associated with controller MTx.

19 # TC10CS (0-1):

Respond with the number of special systems tape controllers for TU42s and TU43s on channel n. If you respond with 0, question number 19A will not be typed.

19A # UNITS ON MTx (1-8):

This question is repeated n times (where n is your response to question number 19). Each time this question is typed, x is incremented to the next alphabetic in sequence. Respond with the number of TU42s and TU43s associated with controller MTx.

20 # RH10'S FOR TM02'S (0-2)

Respond with the number of mass-bus tape controllers for TU16s and TU45s on channel n. If you respond with 1 or 2, questions 20A and 20B will be typed.

20A HOW MANY TM02'S ON RH10 #n (1-8)

Respond with the number of subunits (tape drives) on each unit. This question is repeated once for each RH10 specified in question 20.

20B HOW MANY DRIVES ON TM02 n (1-8)

Respond with the number of drives on the specified TM02.

If you have more data channels to configure, refer to question 13, otherwise, refer to question 24. Questions 14 through 20B will be repeated if you have to configure more DF10 or DF10C channels.

21 # CONTROLLERS (0-1):

Respond with the number of TX01 or TX02 controllers for TU70 tape drives. This question is typed only when you have configured a DX10 data channel. If you respond with 1, question 21A is typed.

21A # UNITS ON MTx (1-8):

Respond with the number of units on TU70 tape drive.

If you have more data channels to configure, refer to question 13. Otherwise, refer to question 24. Questions 21 and 21A will be repeated if you have more DX10 channels to configure.

22 # RH20S for RP04'S, RP06'S (0-1):

Respond with the number of RH20 controllers for RP04 and RP06 disk pack units on channel n. This question is typed only if you configure an RH20 channel. If you respond with 1, question 22A is typed.

22A # UNITS ON RPx (1-8):

Respond with the number of units associated with controller RPx.

23 # RH20'S FOR TM02'S (0-1):

Respond with the number mass-bus controllers for TU16s and TU45s on channel n. If you respond with 1, questions 23A and 23B will be typed.

23A HOW MANY TM02'S ON RH20 # x (1-8):

Respond with the number of tape drives (subunits) associated with RH20 number x.

23B HOW MANY DRIVES ON TM02 x (1-8):

This question is repeated once for each TM02 you specified in response to question 23A.

If you have more data channels to configure, refer to question 13. Otherwise, refer to question 24. Questions 22 through 23B will be repeated if you have more RH20 channels to configure.

24 # TM10AS (0,0-2):

Respond with the number of I/O Bus-type controllers for NRZI-only drives. If you respond with 0, question 24A will not be typed.

24A #UNITS ON MTx (1-8):

This question is repeated n times (where n is your response to question 24). Each time this question is typed, x is incremented to the next alphabetic in sequence. Respond with the number of magtape units associated with MTx.

For each magnetic tape you have configured, MONGEN asks if it is a 7-track unit and if it is capable of 6250 bits/inch density.

First, MONGEN prints the following:

SPECIFY WHICH DRIVES (M-N) ARE 7-TRACK DRIVES. [TYPE ONE NUMBER (M) OR ONE RANGE (M-N) OR ALL ON SEPARATE LINES. TYPE AN EXTRA CARRIAGE RETURN WHEN THROUGH.]

FOR CONTROLLER MTA
.
.
.

FOR CONTROLLER MTB
.
.
.

After MONGEN has asked the above question for each magnetic tape drive, it then asks the following question for each tape drive:

SPECIFY WHICH TAPE DRIVES (M-N) ARE CAPABLE OF 6250 BPI DENSITIES. [TYPE ONE NUMBER (M) OR ONE RANGE (M-N) OR ALL ON SEPARATE LINES. TYPE AN EXTRA CARRIAGE RETURN WHEN THROUGH.]

FOR CONTROLLER MTA
.
.
.

FOR CONTROLLER MTB
.
.
.

25 # JOBS (1-n):

Respond with the maximum number of jobs attached and/or detached. Do not include the null job. Each job requires approximately 1/4 of 1K core, so specify only the number of jobs needed.

26 MAX. K OF CORE FOR EACH JOB (0, 0-n):

This question is typed only for KA10-based systems; question 26A is typed for KI10 and KL10-based systems. Respond with the maximum amount of core that any one job may use. This value is specified in number of 1K core blocks. A response of 0 indicates all of core.

26A MAX. P OF CORE FOR EACH JOB (256-512):

This question is typed only for KI10/KL10 systems. Respond with the maximum amount of core which any one job may use. This value is specified in number of 512-word pages. A response of 0 indicates all of core.

27 # K TOTAL SYSTEM CORE (32-4096):

This question is typed only for KA10-based systems. Respond with the amount of memory the system is expected to use. At monitor initialization time, the operator will be asked if the actual amount of memory is less than your response to this question. You should, therefore, specify the correct amount. If this value is smaller than the amount of memory you want to put on line, the monitor will not allow the operator to put it on line. If more than 256K is desired, you must set the feature test switch FT22BIT to -1.

27A #P TOTAL SYSTEM CORE (256-4095):

This question is typed only for KI10/KL10-based systems. Respond with the amount of memory the system is expected to use. At monitor initialization time, the operator will be asked if the actual amount of memory is less than your response to this question. You should, therefore, specify the correct amount. If this value is smaller than the amount of memory you want to put on line, the monitor will not allow the operator to put it on line.

28 CLOCK TICKS PER SECOND (60,50):

Respond with the number of clock ticks per second (power line frequency). In the U.S., the response should be 60; in most other countries, the response should be 50. If your system has a KL10 processor, you may specify either 50 or 60; your response will determine the frequency of clock interrupts, which are generated by the KL10 interrupt timer. In KA10- and KI10-based systems, your response must conform to the actual frequency of the system power supply.

29 # REAL-TIME DEVICES (0,0-77):

Respond with the number of real-time devices that can be put on a priority interrupt channel simultaneously. The default is zero; the maximum is 77. If your response is 0, question 29A will be typed.

29A ALLOW JOBS TO BE LOCKED IN CORE (Y,N):

Answer Y or N. A response of Y will allow jobs to be locked in core; N will not allow jobs to be

locked in core and question 30 or 30A will not be typed.

30 # K MIN GUARANTEED AMONG JOBS NOT LOCKED IN CORE (0, 0-256):

This question is typed only for KA10-based systems. Respond with a value indicating the amount of core guaranteed among all jobs that are not locked in core. The default is 0, which indicates all of core. If you respond with 0 and answer Y to question 29A, no jobs will be allowed to lock in core. The value you specify in question 30 can be overridden by a SET CORMIN command.

30A # P MIN GUARANTEED AMONG JOBS NOT LOCKED IN CORE (0,0 - max):

This question is typed only for KI10/KL10-based systems. Respond with a value indicating the amount of core guaranteed among all jobs that are not locked in core. The default is 0, which indicates all of core. If you respond with 0 and answer Y to question 29A, no jobs will be allowed to lock in core. The value you specify in question 30A can be overridden by a SET CORMIN command.

31 # HIGH PRIORITY QUEUES (0,0-15):

Respond with the number of high priority queues in your system. The default is 0; the maximum is 15.

32 CCL COMMANDS TO STAY IN CORE (Y,N):

Answer Y or N. Y allows system programs to pass commands to one another via core (TMPCOR monitor call) rather than disk. The preferred answer to this question is Y.

33 METER (Y,N):

Answer Y or N. Y includes the METER monitor call software in your system, which enables performance analysis metering. N omits the METER monitor call software from your system.

34 SYSCHK (Y,N):

Answer Y or N. Y will allow an initial hardware integrity check to be performed at monitor initialization time. N makes it impossible for this check to be performed.

32 MSGSER (Y,N):

Answer Y or N. Y causes the multiplexed-channel

(MPX) software to be loaded. MPX allows more than one device to be associated with a given I/O channel. (This feature is required for operation of TYPESET-10 and/or MCS-10.) N prevents the loading of the MPX software.

36 PSISER (Y,N):

Answer Y or N. Y causes the PSISER program to be loaded. PSISER provides the software interrupt system, which enables users to specify conditions for which an interrupt is to occur. PSISER is required for the operation of MCS-10, GALAXY, and/or TYPESET-10. N prevents the loading of PSISER.

37 IPCF (Y,N):

Answer Y or N. Y causes IPCF (Inter-Process Communication Facility) to be loaded. IPCF allows jobs and/or system processes to communicate with each other. IPCF is required for the operation of MCS-10, GALAXY, and/or TYPESET-10. N prevents the loading of the IPCF software.

38 ENQ/DEQ (Y,N):

Answer Y or N. Y causes the ENQ/DEQ software to be loaded. This software provides synchronization primitives used by COBOL and for simultaneous file updates. N prevents the loading of the ENQ/DEQ software.

39 # CDRS (1,0-2):

Respond with the number of card readers to be configured. The default is 1; the maximum is 2.

40 CDP (Y,N):

Respond Y or N. Y will provide software for a card punch; N will not.

41 DIS (Y,N):

Answer Y or N. Y provides software for a display device (e.g., VP10, 340, 30, VB10C); N will not. The display device asked about here is not to be confused with a display terminal. If you answer Y, question number 41A will be typed. Question number 41A will not be typed if you answer with N.

41A TYPE (VP10,340,VB10C):

Respond with the type of display device you have (VP10, 340, or VB10C). If you have type 30, answer VP10.

42 # TD10S (1,0-2):

Respond with the number of DECtape controllers. The default is 1; the maximum is 2. If your response is 0, question 42A will not be typed.

42A # UNITS ON DTx (1-8):

This question will be repeated n times (where n is your response to question number 39). Each time this question is typed, x will be incremented to the next alphabetic in sequence beginning with A (e.g., DTA, DTB,...). Respond with the number of DECtape units associated with controller DTx.

43 LPTS (1,0-3):

Respond with the number of line printers supported by your system. The default number is 1. If you respond with 0, question 43A will not be typed.

43A LPTn LOWER CASE (Y,N):

Answer Y or N. Y indicates that LPTn has lower-case capability. N indicates that the line printer is upper-case only. This question is repeated n times (where n is your response to question number 40).

44 PLTS (0,0-2):

Respond with the number of incremental plotters supported by your system. The default is 0; the maximum is 2.

45 PTP (Y,N):

Answer Y or N. Y indicates that your system includes a paper tape punch. The inclusion of a paper tape punch is standard for KA10/KI10-based systems, but normally excluded on KL10-based systems.

46 PTR (Y,N):

Answer Y or N. Y indicates that your system includes a paper tape reader.

47 # PTYS (20,0-510):

Respond with the number of pseudo-terminals. (Each operator service routine and batch stream needs one.) This response will usually equal your response for question number 25, which asks for the number of jobs to be attached and/or detached at one time. If your response is greater than zero, FTPTYUUO must be set in F.GEN to -1. Refer

to Chapter 8.

48 DC44 (Y,N):

Answer Y or N. Y indicates that your system includes a DC44 front-end. DC44 is a TYPESET-10 front-end that supports a high-speed paper-tape reader and punch, and an on-line photocomposition machine. If you answer N, question numbers 48A, B, C, and D, and E will not be typed. If you respond with Y, you must set the FTTYPE feature test switch to -1.

48A DL10 PORT NUMBER FOR DC44 (0,0-7):

Respond with the DC44 channel number (port number). The default is 0; the maximum is 3. DL10 port numbers for DC44s should be numbered sequentially, beginning with 0.

48B # OF PA611RS (0,0-32):

Respond with the number of high-speed paper tape readers to be supported with the DC44. The default is 0; the maximum is 32.

48C # OF PA611PS (0,0-32):

Respond with the number of high-speed paper-tape punches to be supported with the DC44. The default is 0; the maximum is 32.

48D # OF LPC11S (0,0-6):

Respond with the number of on-line photocomposition machines to be supported with the DC44. The default is 0; the maximum is 6.

48E PC11 (Y,N):

Answer Y or N. Y indicates that there is a paper tape reader and a paper tape punch on the DC44.

49 # OF DA28S (1,0-4):

Respond with the number of inter-processor data channels for the PDP-8/11/15. The default is 1; the maximum is 4. If your response is 1 or greater and the feature test switch FTXTC equals 0, MONGEN assumes that you do not want any DA28s supported.

49A # OF LINES FOR TTY POOL (8,0-512):

Respond with the number of terminal lines reserved for use on DA28 channels. The default is 8; the

maximum is 512.

50 # DAS78'S (0,0-8):

Respond with the number of DAS78s (bisynchronous support as used by IBM 360s, 370s, and/or 2780s). If you respond with a value greater than 0, you must set the FTDAS78 feature switch to -1.

50A WHICH DL10 PORT IS THE DAS78 CONNECTED TO (0,0-7):

Each DAS78 PDP-11 is connected to a DL10 port. Respond with the number of the DL10 port.

50B DECIMAL LINES ON THE DAS78 (1-16):

Each DAS78 can support up to 16 bisynchronous lines for IBM 360s, 370s, and/or 2760s; respond with the number of lines (in decimal) on this DAS78.

51 DECIMAL "SYMBOL,VALUE"

52 OCTAL "SYMBOL,VALUE"

53 SIXBIT "SYMBOL,VALUE"

In response to questions 51, 52, and 53, type the constants at your installation that deviate from the standard. Unless you specify otherwise, HDWGEN will define each symbol in accordance with predefined standard values. A list and an explanation of the standard symbols and decimal default values appear in Sections 8.14.1, 8.14.2 and 8.14.3. For example, you could specify 1760 as the number of nanoseconds per memory cycle (instead of 1000) by typing:

NSPMEM,1760

If you want to respond with more than one entry, you must type each "symbol, value" on a separate line, and end each line with a carriage return. When you finish typing responses to question 51, type an extra carriage return to force MONGEN to type question 52. If all the standard values are acceptable, type only a carriage return in response to this question.

HDWGEN next types the questions

OCTAL "SYMBOL, VALUE"

and

SIXBIT "SYMBOL, VALUE"

requesting the OCTAL and SIXBIT values that are to

be changed from the standard settings. The answer format is identical to that for the previous question. Deviations from the list of default values are the only responses required. If no changes to the standard are required, you should press the RETURN key in response to each of the questions.

Sections 8.15.1 and 8.15.2 list and explain the standard symbols and octal values; Section 8.16 lists and explains the standard symbols and SIXBIT values.

54 TYPE "DEVICE-MNEMONIC,PI-CHANNEL,HIGHEST-AC-TO-SAVE"

55 TYPE "DEVICE-MNEMONIC, PI-CHANNEL" FOR SPECIAL DEVICES

56 TYPE "DEVICE-MNEMONIC, PI-CHANNEL, NO-OF-DEVICES"

Questions 54, 55, and 56 request special information about non-standard peripheral devices and their associated priority interrupt (PI) channels. If your installation has no special devices, answer the three questions with a carriage return. If your installation has a special device, turn to Section 8.17.

FILE DSK:HDW04D.MAC CLOSED [HDWGEN FINISHED]

8.5 TTYGEN

MONGEN's TTYGEN section allows you to define your system terminal configuration. All possible questions are listed below and on following pages. In order to start the TTYGEN dialogue, you must respond with TTY to question number 1 described in Section 8.3.2.

2 OUTPUT(DSK:TTYCNF.MAC):

If you accept TTYCNF.MAC and the device DSK: as the media for storing your answers to MONGEN, press the RETURN key for your response. If you do not accept them, type your preferred disk name, file name, and project/programmer number.

3 HOW MANY DC10S (1,0-2):

Respond with the number of data line scanners to be supported by your system. The default 1; the maximum is 2. If you respond with 0, question numbers 6 and 7 will not be typed. (Refer to Section 8.18 for a further discussion of DC10s.)

4 HOW MANY DC68S (1,0-2):

Respond with the number of DC68s supported by your system. The default is 1; the maximum is 2. The

DC68 is a PDP-8 680 or 680I communications system. If you respond with 0, question number 8 will not be typed.

5 HOW MANY DC76S (1,0-8):

Respond with the number of DC76s supported by your system. The default is 1; the maximum is 8. The DC76 is a PDP-11 communications system. If you respond with 0, question number 9 will not be typed. This is an unbundled product; therefore, before typing a carriage return, make sure your system includes a DC76.

NOTE

For DC68s and DC76s, the monitor does not need to know the specific type of dataset control hardware, because correspondence of terminal lines to dataset controller is performed within the hardware. When laying out the terminal line configuration in TTYGEN, you must specify the total number of lines available through the DC68 and the total number of lines available through each DC76. DC76 lines that require dataset control must be defined as dataset lines (via question 13).

6 # DC10B [OR 632] 8 LINE DATA GROUPS (1-8):

Respond with a value in the range 1 to 8, where:

1 indicates TTY0-7
2 indicates TTY0-17
3 indicates TTY0-27
4 indicates TTY0-37
5 indicates TTY0-47
6 indicates TTY0-57
7 indicates TTY0-67
8 indicates TTY0-77

NOTE

DC10Cs, DC10Ds, and DC10Hs should be treated as DC10Bs. Line numbers for DC10Bs and DC10Es must be dense or the message SPECIFICATION ERROR-DSCTAB will be printed at the terminal when an attempt is made to assemble the monitor.

7 DC10E DATA SET CONTROL GROUPS (0-7):

Respond with a value in the range 0 to 7.

8 CORRESPONDENCE OF DC10E LINES TO THE DC10B LINES (M-N,P)

Respond with m,p for one pair and m-n,p for a range of pairs (where m is an octal DC10E line, m-n is the octal range of DC10E lines, and p is the octal DC10B line).

9 # OCTAL LINES ON DC68, INCLUDING ITS CONSOLE TTY (1-144):

Respond with the total number of lines available under your system in the range 1 to 144.

10 WHICH DL10 PORT IS THE DC76 CONNECTED TO (0,1-7):

Each PDP-10 is connected to a DL10 port. If there is only one PDP-11, it is always connected to port number 0. If there are two PDP-11s, one is connected to port 0 and the other to port 1.

11 DECIMAL LINES ON DC76 (1-129):

Respond with the number of lines (in decimal) on the DC76. Each DC76F has 16 lines, and the console terminal has one line. A DC76 with two DC76Fs has 33 lines.

12 OPR OCTAL LINE # (CTY,0-n):

Respond with the octal number of device OPR (operator privileged terminal). The default is CTY.

Answer the following questions about your terminal lines (m-n). Type one octal line number (m), one range (m-n), or CTY on separate lines. Type an extra carriage return when you are finished.

13 DATA SET LINES

Respond with the line numbers of those lines that are data set lines. Data set lines are a class of terminals recognized by LOGIN. LOGIN will reset the lines to computer echoing and hardware tabs. DC76 lines that require dataset control must be defined as dataset lines.

14 LINES WITH HARDWARE TABS

Respond with the line numbers of those terminals with hardware generated tab settings. Most TTY model 35s and 37s have hardware TABs, and most model 33s do not. However, since the variety of features found on model 33, 35, and 37 TTYs is so great, every system administrator must determine the physical characteristics of their installation terminals. It is possible to override MONGEN TAB settings with the SET TTY TAB and SET TTY NO TAB commands.

15 REMOTE LINES

Respond with the line number of those lines which are to be considered remote. All data sets are implicitly remote; however, the installation may give REMOTE status to any terminal, even those that are hardwired. In this context, remote is a software characteristic of the terminal that imposes certain restrictions. For example, some project/programmer numbers may not be allowed to LOGIN at remote terminals. (These terminals are not to be confused with those terminals located at a remote station.)

16 LOCAL COPY LINES

Respond with the line numbers of those lines which are to be considered local copy lines (full duplex). With local copy lines, echoing is provided by the terminal instead of by the computer.

17 HALF DUPLEX LINES

Respond with the line numbers of those lines that transmit in half-duplex mode. Half-duplex lines provide two-way, alternate, independent transmission over the same pair of wires.

NOTE

The term half-duplex is occasionally used incorrectly. True half-duplex lines are relatively rare. They include TWX data sets and some local terminals connected by DC10C interfaces. Some lines which are loosely called half-duplex are actually local copy full-duplex. Question number 15 asks for the identification of local copy lines. (If you are interested in reading more about these terms, refer to Section 8.3 of the specification entitled SCNSER, Level D Scanner Service in the DECsystem-10 System Notebooks.)

18 SLAVES

Respond with the line numbers of those lines which can be classified as slaves. Slave is a software classification for terminals that cannot LOGIN or control jobs. These terminals are generally used to provide I/O for jobs that are controlled from other terminals. A terminal can be classified as a slave by any user, but it can be restored to normal status only by the operator.

19 LINES WITH HARDWARE FORM FEED

Respond with the line numbers of those terminals which are to have hardware-generated form feeds. Most model 35 TTYs have hardware-generated form

feeds, and most model 33s do not. Since the variety of features found in terminals is so great, every system administrator must determine the hardware characteristics of their installation terminals. You may assume that no terminals have hardware-generated form feeds, so that the scanner service will always output five lines to simulate form feeds. This can be changed by any user at a terminal via the SET TTY FORM or SET TTY NO FORM commands.

20 LINES WHICH RUN INITIA AT STARTUP

Respond with the line numbers of those terminals that are to run INITIA at start up. INITIA is a program that performs job initialization functions. When the monitor starts up, INITIA is run automatically for those lines specified in your response to this question. Device OPR should be specified in your response; remote terminals, dataset terminals, and remote station terminals should not be specified to run INITIA. There is a file read by INITIA, called TTY.INI, which contains a complete set of parameters for setting up the teletype configurations. The advantage of having TTY.INI is that TTY parameters can be changed without rerunning MONGEN. The INITIA specification in the DECsystem-10 Software Notebooks provides further details about TTY.INI.

21 FILLER CLASS CODES (M-N,P):

Respond with the line numbers of those terminals that require filler characters to standardize output. P is the filler class code. (Refer to the description of the SET TTY FILL command in the DECsystem-10 Operating System Commands Manual for an explanation of the filler class codes.)

8.6 NETGEN

NETGEN is the MONGEN section which defines your system network configuration. All possible questions are listed below and on following pages. In order to start the NETGEN dialogue, you must respond with NET to question number 1, which is described in Section 8.3.2.

2 OUTPUT (DSK:NETCNF.MAC):

Respond with a carriage return if the file name NETCNF.MAC and the device DSK: are acceptable to store your NETGEN dialogue. If they are not acceptable, respond with the desired file name, device and/or project/ programmer number.

3 NETWORK SOFTWARE (Y,N):

Answer Y or N. Y indicates that your installation

desires the software for remote computers: DECsystem-10s, PDP-11s, and PDP-15s. A response of N indicates that the installation does not desire network capabilities and, therefore, does not require the associated software. The file NETCNF.MAC will be closed; NETGEN is finished and question number 1 will be typed again, allowing you to configure FGEN. If you respond with Y, you must also set the FTNET feature test switch to -1.

4 HOW MANY NODES DO YOU WISH TO SUPPORT (3,0-n)

Respond with the number of nodes/stations you wish to be supported by your system. If you respond with 0, NETGEN dialogue will terminate and question number 1 will be printed.

5 HOW MANY DC75NP'S OR DN-87'S ON SYSTEM (1,1-8)

Respond with the number of synchronous front-ends that are to be supported for networks on your system. The default response is 1; the maximum response is 8.

6 TO WHICH DL10 PORT IS THE DC75 or DN87 CONNECTED (0,0-8)

This question is repeated once for each front-end you specified in question 5. Respond with the DL10 port number connected to this DC75/DAS85. The default response is 0; the maximum response is 8.

7 HOW MANY DN87S's ON THE SYSTEM (1, 0-3):

Respond with the number of DN87S network front-ends that are connected to DTE20s.

7A TO WHICH DTE20 IS THE DN87S CONNECTED (1, 1-3):

This question is typed once for each DN87S specified in response to question 7.

8 NODE NUMBER OF CENTRAL SITE (1-77)

Respond with the node number to be associated with the DECsystem-10 at the central site.

9 NAME OF CENTRAL SITE

Respond with the name of the central site in six characters or less.

10 # OF REMOTE TTYS (0,0-512)

Respond with the maximum number of TTYs on network nodes to be handled at any given moment.

11 # OF REMOTE CDRS (0,0-n)

Where n is the maximum response to question number 4 above. Respond with the maximum number of card readers on network nodes to be handled at any given time.

12 # OF REMOTE LPT'S (0,0-n)

Respond with the maximum number of line printers on network nodes to be handled at any given time.

13 # OF REMOTE PTR'S (0,0-0)

14 # OF REMOTE PTP'S (0,0-0)

Respond with the maximum number of remote paper-tape punches on network nodes to be handled at one time.

15 # OF MTA'S (0,0-0)

17 # OF REMOTE PROCESSES (0,0-n)

Respond with the maximum number of remote processes that can be connected at any given time. To answer this question with a value greater than 1, you must set FTTSK to -1.

18 REMOTE DATA ENTRY SOFTWARE (Y,N):

Answer Y or N. Y indicates that you want the software to support remote data entry terminals, which are used for MCS-10 applications. If you respond with Y, FTRDX in FGEN must be set to -1.

19 # OF CONNECTS (46,1-512)

Respond with the maximum number of simultaneous connections.

8.7 FGEN

The FGEN dialogue simplifies the task of choosing appropriate software from a wide selection. For example, FGEN allows you to select the standard DECsystem-10 features for a given application.

If you are choosing all the standard software features, simply agree during the dialogue to accept the standard symbol settings by typing a carriage return. Your F.MAC file will then contain all these standard settings; these, when assembled with the other GEN files, will produce a monitor with the appropriate routines.

Standard DECsystem-10 software features are included or deleted by setting feature test switches to -1 or to 0: -1 places the feature in the monitor, and 0 omits it.

In order to set the appropriate feature test switches, you will need the file FGEN.HLP. MONGEN will first look for FGEN.HLP on the directory from which MONGEN came, then it will look for it on SYS:. If FGEN.HLP cannot be found, the message %Can't find FGEN.HLP will be printed on your terminal.

FGEN allows you to:

1. List the standard settings for a given application (TINY,KALUG,KILUG,KAFULL,KIFULL,KLFULL).

2. Determine what the feature test switch symbols mean.

3. Alter the feature test switch settings.

4. Add new feature test switches.

2 OUTPUT (DSK:F.MAC):

If you accept F.MAC and the device DSK: as the media for storing your answers to MONGEN, press the RETURN key for your response. If you do not accept them, type your preferred disk name, file name, and project/programmer number.

3 FEATURE SET(TINY,KALUG,KILUG,KAFULL,KIFULL,KLFULL):

There are six standard feature settings; respond with one of them. Only these standard settings have been tested during monitor development and are fully supported. Although installations may alter the combination of individual feature test switches or add new switches during FGEN, such non-standard switch combinations have not been tested and are not supported. We wish to emphasize that you may alter the feature test setting from the standard or LUG configurations; however, the new combination is NOT supported by DIGITAL.

4 STANDARD SETTING (YES,NO,LIST,EXPLAIN):

Respond with one of the words within the parentheses.

YES Answer YES (the default) if you accept the DECsystem-10 standard feature test switch settings, as identified in the previous question.

A YES ends FGEN and closes the F.MAC file. You may now redefine another segment of MONGEN or exit from the program.

NO A NO allows you to change the setting of individual switches or add new feature test switches. You can do this by typing the switch symbol (e.g., FTxxx) and the value (0 or -1) in the form

switch, value

Press the RETURN key twice after the last entry.

LIST LIST allows you to examine the current setting for any and all of the feature test switches. You may then either accept or change the current setting.

The standard setting for each feature test switch varies with the installation's DECsystem-10 application, e.g., TINY, KALUG, KILUG, KAFULL, KIFULL or KLFULL. You can obtain the default value for an individual feature test switch by typing LIST <CR> in answer to the question, and then typing the requested switch symbol followed by a carriage return. FGEN returns that switch symbol and its current setting. To obtain the value of another switch, type the requested switch, followed by a carriage return. After the last entry, press the RETURN key twice.

To obtain the current values for all of the feature test switches you can type LIST <CR> and then type ALL, followed by a carriage return. FGEN will list all feature test switch symbols and their values on your terminal.

EXPLAIN EXPLAIN allows you to examine the meaning of any or all of the feature test switch symbols in addition to the current value. You can obtain the default value and meaning for a feature test switch symbol by responding to EXPLAIN (or E) in the same way you could respond to LIST (or L). For example, the dialogue (in prompt mode) to obtain the default value and meaning for feature test switches FTTIME and FTSLEE is as follows:

```
STANDARD SETTING (YES, NO, LIST, EXPLAIN): EXPLAIN <CR>

Only stand settings have been tested by DEC;  all other
settings may produce incorrect operation.

Switch (switch to list or explain).

FTTIME <CR>
FTTIME, -1;
         ;TIME ACCUMULATION

FTSLEE <CR>
FTSLEE, -1;
         ;SLEEP UUO
```

After you have completed the dialogue sequence associated with NO, LIST, or EXPLAIN, FGEN repeats the question:

```
STANDARD SETTING (YES, NO, LIST, EXPLAIN):
```

You should answer YES if all of the values are acceptable, NO if you wish to change any settings, and LIST or EXPLAIN if you wish to obtain any more default information.

When you answer NO and change the switch settings that you wish to change, you may have FGEN type each switch and ask for its final setting. FGEN asks

```
SET EACH SWITCH (Y,N):
```

When you type YES, FGEN types

FTxxxx,M (ON,OFF,LIST,EXPLAIN,END):

for each switch, where M=-1 if the switch is on and M=0 if the switch is off. You can then specify whether the switch should be ON or OFF, or whether to enter LIST or EXPLAIN mode as before. By typing END, you can specify that no more switches are to be listed and that the current values are to be used.

5 DO YOU WANT THE VIRTUAL MEMORY FACILITY (YES,NO):

This question will only be typed for KI10- or KL10- based systems. Answer Y if you want virtual memory capabilities and have VMSER (which is an unbundled licensed product).

8.8 PRODUCING RELOCATABLE BINARY FILES COMMON.REL, COMMOD.REL, AND COMDEV.REL

8.8.1 Assembling the Configuration Files

You should assemble the files HDWCNF.MAC, TTYCNF.MAC, NETCNF.MAC, F.MAC, with S.MAC and COMMON.MAC to produce the relocatable binary file COMMON.REL, the files HDWCNF.MAC and F.MAC with S.MAC and COMMOD.MAC to produce COMMOD.REL, and the files HDWCNF.MAC, TTYCNF.MAC, NETCNF.MAC, F.MAC, with S.MAC and COMDEV.MAC to produce COMDEV.REL.

To assemble a 6.03 Monitor type

```
COMPIL  F/COMP,S/COMP,HDWCNF+NETCNF+TTYCNF+<COMMON,COMDEV,COMMOD>
```

It is important that F.MAC precede S.MAC, because S has conditional assemblies depending on the contents of F. Also, all of the remaining files must follow S.MAC and precede COMMON.MAC.

8.8.2 Assembly Error Messages from COMMON

One or more of the following messages are typed on your terminal if your attempt to assemble COMMON is unsuccessful.

1. ?MORE THAN N. TTYS + PTYS EXCEED FIELD OF DDB.^1

   The system capacity of 511 TTYs and PTYs has been exceeded. You must rerun MONGEN, answering questions for fewer TTYs and PTYs.

2. ?NOT ENOUGH PI'S TO SERVICE THIS CONFIGURATION SUGGEST EDITING COMMON TO PUT MORE DEVICES ON A SINGLE CHANNEL.

   The system capacity of seven priority interrupt channels has been exceeded. You should assign more devices to each PI channel by editing INTTAB in the source of COMMON or by changing the PI assignment of the special devices that have been added.

---

1. Note that all error messages are preceded by a number. These numbers are used for reference only; they are not printed by COMMON.

3. ?FT2REL MUST BE -1 WHEN 2 RELOC REGISTERS EXIST.

4. ?PLEASE ASSEMBLE SOURCES WITH FTRTTRP = -1.

5. ?PLEASE ASSEMBLE SOURCES WITH FTLOCK = -1.

6. ?PLEASE ASSEMBLE SOURCES WITH FTHPQ = -1.

   Messages 3 through 6 indicate that you specified incorrect settings in F.MAC, i.e., you have asked for a feature to be included with HDWGEN but you did not include the feature in FGEN. You must rerun FGEN to correct the improper symbol definitions.

7. ?SPECIFICATION ERROR - DSCTAB.

   There is a specification error in the data set control table. You must correct it by running MONGEN again. Usually this error occurs when line numbers are not dense on DC10Bs and DC10Es.

8. %NUMBER OF JOBS REDUCED TO MAX=511.

   You specified more than 511 jobs. You should rerun MONGEN to correct the error.

9. ?512 OR MORE PTY'S EXCEEDS FIELD OF DDB.

   You specified more than 512 PTYs. You should rerun MONGEN to correct the error.

10. ?TRAP OFFSET SWITCH CANNOT BE SET ON A SINGLE PROCESSOR SYSTEM.

    You incorrectly set the CPTOS switch. You must rerun MONGEN and change the setting of the CPTOS switch to 0 if you have a single processor system. (Refer to Section 8.15, Octal Default Values.)

11. ?DL10 MAPPED AREA EXCEEDS 1K.

    You made the mapped area too large. You must reduce the size of the mapped area, or change jumper in DL10 hardware to 8K and add "DLX8K ==1" in REMCNF.MAC.

12. ? DL10 MAPPED AREA EXCEEDS 8K.

    The mapped area is still too large. You must reduce the size of the mapped area following the procedures described in message 11.

13. ? DLXLNG IS NOT EQUAL TO LENGTH OF MAPPED AREA.

    You have specified DLXNG to be either less than or greater than the length of the mapped area. You must change it so that it is equal to the length of the mapped area. (This is an internal error and should not occur.)

8.9 DESCRIPTION OF THE CONFIGURATION FILES

The following configuration files are produced by the MONGEN dialogue program:

1. HDWCNF.MAC is produced by HDWGEN
2. TTYCNF.MAC is produced by TTYGEN
3. NETCNF.MAC is produced by NETGEN
4. F.MAC is produced by FGEN

All four of these files contain the following information for each of the questions asked:

1. The question asked by the program as a comment
2. Your response to the question as a comment
3. The MACRO definitions containing the switch or symbol and its value.

MONGEN always defines all the symbols that appear in the configuration files, regardless of your answer to a question. Therefore, you do not have to study the MONGEN program in order to understand what happens on certain questions. It is sufficient that you only look at the listings of the configuration files that are assembled with COMMON.MAC.

8.9.1 Description of COMMON.MAC

Since COMMON.MAC selectively assembles only those items needed for the defined configuration, it contains the following items:

1. The default symbols that you can override during the MONGEN dialogue.
2. Special lower core locations (below 400 in the monitor).
3. The monitor startup locations.
4. The EXEC page map for a KI10/KL10 processor.
5. The PDP-10/PDP-11 shared core area on systems with DC75s.
6. CPU data blocks (CDBs) for each processor.
7. Variable data locations for the monitor.
8. The job and high segment tables.
9. The terminal data base.
10. Monitor initialization code to link device data blocks and to create multiple copies for all multiple devices, with the exception of disk.
11. Special MACROs to define the PI assignment. These MACROs create a two-word-per-entry table that contains the following:

a. Device Data Block address

b. Number of devices

c. Priority Interrupt channel for device

d. Interrupt location for device

e. Length of Device Data Block if multiple device

12. Locations set by ONCE-Only dialogue.

13. System error stop code (407 restart).

14. Common subroutine returns.

15. Subroutine to save and restore preserved accumulators.

16. Common byte pointers.

17. The PI channel save and restore routines.

18. Code to handle traps to 40 and 60 (primary CPU) and 140 and 160 (secondary CPU) and the code to handle APR interrupt entry and exit.

19. Remote communications entry points and tables.

20. Real-time trapping tables.

21. High priority queue UUO code.

22. Scheduler queue definitions and tables.

8.9.2 Description of COMMOD.MAC

You assemble COMMOD.MAC with HDWCNF.MAC, F.MAC and S.MAC to produce COMMOD.REL. COMMOD selectively assembles the items required for the defined configuration. It contains the following items:

1. The assembly instructions.

2. The default symbols that you can override during the MONGEN dialogue.

3. The instructions for writing a new controller routine.

4. The symbol naming conventions.

   a. 3-letter prefixes

   b. 3-letter suffixes

5. The list of upper and lower limits for various disk parameters.

6. The data structure description.

7. The core and disk block symbol definitions for the file system.

a. Generalized core blocks

b. Access table

c. BAT blocks

d. Channel Data Blocks

e. Device Data Blocks

f. Home blocks

g. Monitor job tables

h. Controller Data Blocks

i. Logical block numbers within unit

j. Monitor buffer

k. Name block

l. Project-Programmer number block

m. RIB blocks

n. SAT blocks

o. File structure data block

p. System variables

q. UFD blocks

r. Unit data blocks

8.9.3 Description of COMDEV.MAC

COMDEV.MAC contains symbols, code, and data bases associated with devices (in the following order). The items are listed below.

1. Conversion symbols from the old MONGEN format (XXXXXn) to the new (M.XXXX).

2. Terminal (TTY) and remote station conversion symbols.

3. MONGEN default symbols.

4. Terminal (TTY) data base.

5. Remote station data base.

6. All other device-specific code and data bases.

7. EXTERNS used to load the proper device routines from the monitor library.

8.10 HDWGEN EXAMPLE

```
.R MONGEN

MONGEN for 603 monitors

/HELP(PROMPT,SHORT,LONG)]: LONG

Which GEN(HDW,TTY,NET,F)[
HDW to define hardware configuration
TTY to define terminal configuration
NET to define network configuration
F to define software features]: HDW

Output(DSK:<cr>HDWCNF.MAC):<cr>

DECsystem10(1040,1050,1055,1070,1077,1080,1088)[
1040 is small disk system with KA10 cpu
1050 is large disk system with KA10 cpu
1055 is disk system with 2 KA10 cpu's
1070 is disk system with KI10 cpu
1077 is disk system with 2 KI10 cpu's
1080 is disk system with KL10 cpu
1088 is disk system with 2 KL10 cpu's]: 1080<cr>

System name[24 characters or less]: TESTER603<cr>

CPU0 serial #(1-10000): 3333<cr>

Exclude Monitor overhead from user run time(Y,N)[
Overhead is CPU time spent clock queue processing, command
decoding, core shuffling, swapping, and scheduling.
User run time always includes UUO execution and
unless EBOX/MBOX runtime accounting is selected
(KL10 systems only) includes IO interrupt service time.
On KA or KI systems, each CPU must have a DK10]: Y<cr>

EBOX/MBOX runtime accounting?(y,n)[
If EBOX/MBOX runtime accounting is selected in a KL10
based system, user runtime is computed using the KL10
internal accounting clocks]: Y<cr>

Exclude PI time from user runtime?(y,n)[
An answer of "yes" to this question will cause the monitor
to set up the KL10 accounting meters in such a manner that
users will not be charged for cpu time used during interrupts]: Y<cr>

# Data Channels(2,1-8)[DF10s, DF10Cs, DX10s OR RH20'S  for disk and tape]: 2<cr>

Channel 0 Type (DF10,DF10C,DX10,RH20): RH20<cr>

On channel # 0:

  # RH20S for RP04'S, RP06'S(0-1)[Controllers for RP04, RP06 disk pack
units on channel 0]: 1<cr>
  # Units on RPA(1-8): 2<cr>
  # RH20's for TM02'S (0-1)[Mass-Bus tape controller for
TU16's and TU45's on channel 0]: 1<cr>
  How many TM02's on RH20 # 0 (1-8)[EACH UNIT CAN CONTROL
UP TO 8 SUB-UNITS = TAPE DRIVES]: 2<cr>
How many drives on TM02 0 (1-8): 2<cr>
How many drives on TM02 1 (1-8):2 <cr>

Channel 1 Type (DF10,DF10C,DX10,RH20): DX10<cr>
```

```
On channel # 1:
  # Controllers(0-1)[TX01's or TX02's for TU70 Tape Drives on channel 1]: 1<cr>
  # Units on MTB(1-8): 2<cr>
TM10As(0,0-2)[I/O Bus type Controller for NRZI only drives]: 0<cr>

Specify which drives (M-N) are 7 track drives.
[Type one number (M) or one range(M-N) or ALL on separate lines.
Type an extra carriage return when through.]
For controller MTA
<cr>
For controller MTB
<cr>

Specify which tape drives (M-N) are capable of 6250 BPI densities.
[Type one number (M) or one range (M-N) or ALL on separate lines.
Type an extra carriage return when through.]
For controller MTA
<cr>
For controller MTB
<cr>

# DTEs on CPU0(2<cr>,1-4)[BYTE TRANSFER DEVICE USED FOR KL10 to PDP-11 front end communica
tions]: 2<cr>

# Jobs(1-511)[Maximum number attached and detached, not
counting null job]: 80<cr>

Max. PAGES of core For each job(0,0-512)[0 means all of core]: 256<cr>

# K total system core(32-4096)[ONCE-only reports if
less core at startup]: 1056<cr>

Clock ticks per second(60,50)[Power line frequency]: 60<cr>

# Real-time devices(0,0-77)[Max. # which can be put
on PI channels simultaneously]: 0<cr>

Allow jobs to be locked in core(Y,N): Y<cr>

# PAGES min guaranteed among jobs not locked in core(0,0-512)[
minimum free core pool for unlocked jobs, 0 assumes all of core]: 256<cr>

# High priority queues(0,0-15): 2<cr>

CCL commands to stay in core(Y,N)[System programs pass
commands to each other via core(TMPCOR UUO) rather than disk]: Y<cr>

Meter(Y,N)[Performance analysis metering(METER UUO)]: Y<cr>

SYSCHK(Y,N)[Initial Hardware integrity check at ONCE-only time]: N(cr>

MSGSER(Y,N)[Support for device MPX. (more than one device
on an I/O channel). This feature is required for TYPSET-10
and MCS-10]: Y<cr>

PSISER(Y,N)[Advanced programmed software interrupt service -
Support for the PISYS. UUO. This provides an easy
and powerful interrupt method for program to trap asynchronous
events. Required bY<cr> MCS-10]: Y<cr>

IPCF(Y,N)[Inter process communition facility]; Y<cr>

ENQ/DEQ(Y,N)[Sychronization Primitives To-allow
simultaneous file update by multiple co-operating processes]: Y<cr>
```

```
# CDRs(1,0-2)[Card reader]: 0<cr>

CDP(Y,N)[Card punch]: N

CP10D(Y,N)[Special Systems unbuffered Card Punch]: N<cr>

DIS(Y,N)[Display device(VP10,340,30,VB10C) as distinguished from
display terminals]: N<cr>

# TD10s(1,0-2)[DECtape controls]: 2<cr>

  # Units on DTA(1-8): 4<cr>

  # Units on DTB(1-8): 2<cr>

LPTs(1,0-3)[Line printers]: 3<cr>

LPT0 Lower case(Y,N)[Does LPT0 have lower case capability]: Y<cr>

LPT1 Lower case(Y,N)[Does LPT1 have lower case capability]: Y<cr>

LPT2 Lower case(Y,N)[Does LPT2 have lower case capability]: N<cr>

PLTS(0,0-2)[Plotters]: 0<cr>

PTP(Y,N)[Paper tape punch]: Y<cr>

PTR(Y,N)[Paper tape reader]: Y<cr>

# PTYs(20,0-510)[Pseudo-terminals - each operator
service program and Batch stream needs one]: 20<cr>

DC44(Y,N)[
The DC44 is a TYPESET-10 front end which supports
the following devices:
PA611R       High speed paper tape reader
PA611P       High speed paper tape punch
LPC11        Online photocomposition machine]: N<cr>

# of DA28s(0,0-4)[Interprocessor channels for PDP8/11/15]: 0<cr>

# DAS78'S(0,0-8)[IBM 360, 370, and/or 2780 support]: 0<cr>

Decimal "symbol,value"[
For any symbols to be defined.
Type one per line, extra carriage return when through]
<cr>
<cr>

Octal "symbol,value"[
For any symbol to be defined.
Type one per line, extra carriage return when through]
<cr>
<cr>

SIXBIT "symbol,value"[
For any sixbit symbol to be defined.
Type one per line, extra carriage return when through]
<cr>

Type "device-mnemonic,PI-channel" for special devices[
With neither channel AC save routine nor device data block,
the "device-mnemonic" must be 3 characters or less.
```

```
Type extra carriage return when through.]
<cr>

Type "device-mnemonic,PI-channel,no.-of-devices"[
For special devices with device data blocks.
the "device-mnemonic" must be 3 characters or less.
Type extra carriage return when through.]
<cr>

Type "device-mnemonic,PI-channel,highest-ac-to-save"[
For special devices with channel save routines to save acs up to
the "highest-ac-to-save".  "Device" must be 3 char or less.
Type extra carriage return when through.]
<cr>

File DSK:HDWCNF.MAC Closed [HDWGEN finished]
```

8.11 TTYGEN EXAMPLE

```
Which GEN(HDW,TTY,NET,F)[
HDW to define hardware configuration
TTY to define terminal configuration
NET to define network configuration
F to define software features]: TTY<cr>

Output(DSK:TTYCNF.MAC): <cr>

How many DC10s(1,0-2)[
The DC10 is a data line scanner]: 1<cr>

How many DC68s(1,0-2)[
The DC68 is a PDP-8 680 or 680I communications system]: 1<cr>

How many DC76s(1,0-8)[
The DC76 is a PDP-11 communications system]: 0<cr>

For DC10 0:

# DC10B[ or 632] 8 line data groups(1-8)[
1 is TTY0-7, 2 is TTY0 - 17, ... 8 is TTY0 - 77]: 2<cr>

# DC10E Data set control groups(0-2): 2<cr>

Correspondence of DC10E lines to the DC10B lines(M-N,P)[
Type M,P for one pair and M-N,P for a range of pairs
where M is octal DC10E line, M-N is octal range of DC10E
lines, and P is octal DC10B line]
<cr>
<cr>

FOR DC68 0:

# Octal lines on DC68, including its console TTY(1-144): 20<cr>

OPR octal line #(CTY,0-37)[OPR is privileged operator terminal]:
Answer the following questions about your TTY lines(M-N).
[Type one octal line #(M) or one range(M-N) or CTY on separate
lines.  Type extra carriage return when through.]
<cr>

Data set lines[Class of terminal for LOGIN, LOGIN resets line
to computer echoing and no hardware tabs]
<cr>

Lines with hardware tabs[Monitor simulates rest with spaces]
<cr>

Remote lines[Class of terminal for LOGIN, do not confuse
with remote station TTYs]
3-7<cr>
<cr>

Local copy lines[Echoing provided by terminal rather than
by computer.  Often (incorrectly) called half duplex]
10-12<cr>
<cr>

Half duplex lines[TWX or half duplex wired scanner(DC10C)]
<cr>

Slaves[No commands may be typed]
```

```
<cr>

Lines with hardware form feed[Leave out if users
would rather not get form feeds until they do TTY FORM commands]
<cr>

Lines which run INITIA at startup
0-16<cr>
<cr>

Filler class codes(M-N,P)[
Type M,P for one line M with filler class code P or
M-N,P for a range of lines with filler class code P]
<cr>

2741 lines on DC-10 interfaces[]
<cr>

File DSK:TTYCNF.MAC Closed [TTYGEN finished]
```

8.12 NETGEN EXAMPLE

```
Which GEN(HDW,TTY,NET,F)[
HDW to define hardware configuration
TTY to define terminal configuration
NET to define network configuration
F to define software features]: NET<cr>

Output(DSK: <cr>NETCNF.MAC): <cr>

Network software(Y,N)[
Software to support remote computers: DECsystem-10's,
PDP-11's, PDP-8's (requires FTNET to be -1)]: Y<cr>

How many nodes do you wish to support(3,0-63)[Maximum]: 3<cr>

How many DC75NP's or DN87's on the system(1,0-8)[Network
front-ends connected to DL10's.]: 1<cr>

For front end number 1:

To which DL10 port is the DC75 or DN87 connected (0,0-7)[]:
How many DN87S's on the system(1,0-3)[Network
front-ends connected to DTE-20's]: 0<cr>

Node number of central site(1-77)[
Unique number identifying DECsystem-10 to network.]: 1<cr>

Name of central site[Six characters or less.]: CENTRAL<cr>
%More than 6 characters.
Name of central site[Six characters or less.]: CENTER<cr>

# of remote TTY's(0,0-512)[
Maximum number of teletypes on network nodes to be
handled at any given time.]: 12<cr>

# of remote CDR's(0,0-63)[
Maximum number of card readers on network nodes to be
handled at any given time.]: 0<cr>

# of remote LPT's(0,0-63)[
Maximum number of line printers on network nodes to be
```

```
handled at any given time.]: 22<cr>

# of remote PTR's(0,0-0)[
Maximum number of paper tape readers on network nodes to be
handled at any given time.]: 0<cr>

# of remote PTP's(0,0-63)[
Maximum number of paper tape punches on network nodes to be
handled at any given time.]: 0<cr>
# of remote MTA's(0,0-0)[
Maximum number of magnetic tape drives on network nodes to be
handled at any given time.]: 0<cr>

# of remote processes(0,0-128)[
Maximum number of remote processes that can be connected to at
any given time (requires FTTSK to be -1).]: 12<cr>

Remote data entry software(Y,N)[
Software to support remote data entry terminals for MCS-10 applications
(requires FTRDX to be -1)]: Y<cr>

# of connects(46,1-512)[
Maximum number of simultaneous connections.]: 46<cr>

File DSK:NETCNF.MAC Closed [NETGEN finished]
```

8.13 FGEN EXAMPLE

```
Which GEN(HDW,TTY,NET,F)[
HDW to define hardware configuration
TTY to define terminal configuration
NET to define network configuration
F to define software features]: F<cr>

Output(DSK: <cr>F.MAC): <cr>

Feature set(TINY,KALUG,KILUG,KAFULL,KIFULL,KLFULL)[
TINY   Is minimum subset of features for KA10 timesharing
KALUG  Is medium size KA10 monitor with enough features for  batch
KILUG  Same as KALUG but for KI10 cpu
KAFULL Includes all features of DECsystem10 monitor such
        as real-time and extended file system for KA10 cpu
KIFULL Same as KAFUL but for KI10 cpu
KLFULL  Same as KIFULL but for KL10 cpu]: KLFULL<cr>

Standard setting(YES,NO,LIST,EXPLAIN)[
Standard values for all feature test switches for your configuration]: YES<cr>

Do you want the virtual memory facility(YES,NO)[VMSER must
be on your distribution tape]: YES<cr>

File DSK:F.MAC Closed [FGEN finished]
Which GEN(HDW,TTY,NET,F)[
HDW to define hardware configuration
TTY to define terminal configuration
NET to define network configuration
F to define software features]:

.
```

8.14 DECIMAL DEFAULT VALUES

This section contains a description of the standard symbols and default decimal values assumed by the MONGEN program. Section 8.14.1 lists those symbols defined in COMMON; Section 8.14.2 lists those symbols defined in COMDEV; and Section 8.14.3 lists those symbols defined in COMCON. All symbols are listed in the order in which they are defined.

8.14.1 Symbols Defined in COMMON

NSPMEM, 1000

The number of nanoseconds per memory cycle. This symbol is used to compute the amount of time spent performing core shuffling, and it is printed by the SYSTAT command. For systems with MB10 memories, the constant should be changed to 1760.

EPL4WD, 17

The number of 4-word blocks in the extended executive push-down list. When extended it is one-fourth the length of the maximum executive push-down list. If a push-down list overflow occurs, this value should be increased.

MONCOR, JOBN*72+EPLLEN (Large Disk Systems)

The monitor reserves a table of at least MINCOR words, or possibly up to the next 1K boundary, for allocating disk device data blocks and extended push-down lists. MONCOR is normally JOBN*90 words, allowing 2.5 open disk files per job. If this value is too small, a larger value may be supplied. The total size of the monitor is printed after this space is reserved in the long ONCE-Only dialogue.

MINCOR, JOBN*55 (Small Disk Systems)

For a small disk system, there are only 1.5 open disk files per job. Otherwise, the explanation is the same as for large disk systems above.

CTYDCR, 18

The delay for CTY carriage return during ONCE-Only dialogue. The default causes an 18-jiffy delay. This allows the monitor to pause before printing on the next line, allowing the CTY to execute a carriage return/line feed.

RLDTIM, 112

The time until an auto-reload.

MINMAX, 1024*12

The smallest value allowed for CORMAX after the system begins execution.

UNIQ1,1 UNIQ2,1 and UNIQ12 ... UNIQ6,1 ... UNIQ16

These represent priority interrupt channels for the exclusive use of a special device. If the priority interrupt channels are to be reserved, set the value of UNIQn to 1, where n is the channel

number. For example, if a real-time device requires extremely fast response time, it is necessary to set the BLKI/BLKO pointer in the channel location. (Channel 7 cannot be reserved, as it is always used for the clock.)

INDPPN,0

If the value of INDPPN is 0, each programmer number refers to the same person in every project. If the value of INDPPN is 77777, programmer numbers may be assigned independently within each project. This affects only the disk file access protection mechanism.

M.QSTR,0

The default structure for the QUEUES.

SYSSEG,-1

This function checks files for a flag indicating they are SYS files. This function also prevents dormant or idle segments from sitting in core, in addition to achieving fast GETSEGs from SYS:.

CPTOS,0

CPTOS = 0 sets the trap offset for dual processor systems. CPU0 normally traps to location 40, and CPU1 normally traps to location 140. CPTOS = 0 traps CPU1 to location 40 and CPU0 to location 140. The value of CPTOS must be set to 0 for single-processor systems. (KA10 only.)

UFCO, 10

Monitor call fairness count for CPU0 in a multi-processor system.

UFC1, 10

Monitor call fairness count for CPU1 in a multi-processor system. (CPU1 picks UFC1 jobs that have just completed monitor calls on CPU0 before picking a job on CPU1.)

M.CBAT, 10

The maximum number of bad memory addresses stored in each CPU data block on a memory parity error sweep of core.

STDENS,5

The standard magtape density, if the user program does not override the symbol value with an INIT, OPEN, or SETSTS monitor call or with the SET DENSITY command. The standard is 6250 bpi for TU70s.

1 = odd parity + 200 bpi
2 = odd parity + 556 bpi
3 = odd parity + 800 bpi
4 = odd parity + 1600 bpi
5 = odd parity + 6250 bpi

M.BMAX, 13

The initial setting for the maximum number of MPB jobs permitted to log-in simultaneously. This value initializes the monitor GETTAB word BATMAX. The operator can change this value during

system operation with the OPSER command: SET BATMAX.

M.BMIN, 0

The initial setting for the minimum number of jobs guaranteed for MPB. This value initializes the monitor GETTAB word BATMIN. The operator can change this value during system operation with the OPSER command :SET BATMIN.

JIFSEC.60

The number of clock ticks per second, i.e., jiffies.

DDTRY,4

The number of times the monitor is to try to recover from DECtape errors.

M.EXE, 1

The symbol which determines the type of file to be created on the execution of the SAVE command. If M.EXE = 0, normal (i.e., SAV, HGH, LOW, SHR) files are created; if = 1, .EXE files are created.

TXTRA,0

The number of extra terminal disk data blocks for slave lines.

LOGSIZE,12

The minimum amount of virtual core required for a user to be logged-in. This value must be at least as large as the LOGIN system program, which is currently 12K. If the amount of core is insufficient, the user will receive a CORE UNAVAILABLE error message, which includes the virtual amount of core remaining.

M.JMAX, M.JOB

The initial setting for the maximum number of jobs permitted to LOGIN simultaneously. (This includes all classes of jobs: batch, interactive, or operator service jobs. Note that operator service jobs, subjobs under [1,2], or subjobs at OPR or CTY are not restricted from logging-in even if LOGMAX is exceeded, because the task may be a critical system function.)

This value, which cannot be less than 1, initializes the monitor GETTAB word LOGMAX. The operator can change this value during system operation with the OPSER command :SET LOGMAX.

M.CMCT, 32

The number of times the core tables (CHKTAL) are to be checked before performing its defined functions, which requires approximately 5 ms of overhead. This reduces CPU time for CORE, GETSEG, and RUN monitor calls. The maximum value to which this symbol may be set is 262,000.

M.XFFA, 0

If M.XFFA is non-zero, the File Daemon will not be called if the program accessing the file is being run under [1,2] or has the JACCT bit set.

8.14.2 Symbols Defined in COMDEV

MTSIZ, 128

The size of magnetic tape records in 36-bit words (i.e., data words in the buffer). Users can override this value by using the SET BLOCK SIZE MTAn: command. Programs can override this value by building special buffers.

LPTSIZ, 29

The size of the line printer buffer + 2. The value of 29 allows a full line to be typed on a 132-column line printer in one buffer. This value should be changed to 26 when using 120-column line printers.

FLCDEF, 1

The filler class code to use if one is not specified for a TTY line.

MTELOG, -1

If = -1, errors that require more than one retry are logged. If = 0, all recoverable errors are logged.

MTDAEM, 10

The number of times per reel to call DAEMON for magtape error reporting.

8.14.3 Symbols Defined in COMMOD

STRMAX, 14

The maximum number of disk file structures that can be on line simultaneously. By decreasing this value, one word will be saved for each decrement of 1. This value is automatically set to 1 for 1040 systems; the value cannot exceed 14.

CCWMAX,10

The maximum length in words of each disk channel command list. Altering this value will affect efficiency and space. The value is set to 10 for 1040 systems. CCWMAX is not used for KI10 and KL10 systems.

SWPMAX,8

The maximum number of disk units that may be used for swapping (1 word per unit). The value is set to 1 for 1040 systems.

SWCLSN,7

The highest class number for swapping; this value cannot exceed 7.

DSKTRY,10

The number of times to try on disk data errors for all file structures before recalibrating (inclusive of the initial try).

SERTRY,3

The number of times to try on search errors before recalibrating (inclusive of the initial try).

RCLTRY,10

The number of times to recalibrate and try on DSKTRY disk data errors or on SERTRY search errors (inclusive of the initial try). The total number of disk tries with recalibration is equal to DSKTRY * RCLTRY (i.e., 10 * 10 = 100). The total number of search tries with recalibration is equal to SERTRY *RCLTRY (i.e., 10 * 3 = 30).

CHVIFP,10

The standard initial fairness count for positioning. The monitor chooses the nearest request for positioning (CHVFP times -1) before taking the longest waiting request.

CHVIFT,10

The standard initial fairness count for transfers. The monitor chooses the shortest latency for a transfer (CHVIFT times -1) before taking the longest waiting request.

PTRLEN,6

The number of in-core retrieval pointers per file length; this offsets the size of the device data block.

FIL4WD,9

The number of 8-word blocks allocated per job in a common pool of monitor free core. The value of FIL4WD should be increased if the ENTER monitor call's error code 16 is received regularly. To assign this space the ONCE-Only code multiplies this factor by the number of jobs. These blocks are used by the Level-D Disk Service for active, dormant, ACC, NMB, PPB, and UFB blocks. This pool is permanently reserved for these blocks and is not used for any other purpose. Another pool is used for variable length core blocks, such as disk service data blocks and extended exec push-down lists. The system sets the minimum number of 4-word core blocks to 50 with 5 or fewer jobs. The value is set to 5 for 1040 systems.

UNVRSF,500

The reciprocal factor of the total disk size. The amount of disk space is subtracted from the number of free blocks when the monitor is started up. This area is not available for users' data. It is a safety factor that ensures there is room to write the second RIB, etc. The standard reserved for this purpose is one five-hundredth of the disk space.

MBFN,2

The number of 128-word monitor buffers used for the reading and writing of non-user data. This value must be at least 2. The default for MBFN is the number of jobs divided by ten, plus one. For example, the default for a 50 job system is 6.

LBNHOM,1 LB2HOM,10

The standard logical block number on each unit that contains the HOME block. Note that it is also possible to change this value for a specific disk unit as follows:

```
xxxnHM,LBNHOM
xxxnH2,LB2HOM
```

Where:xxxn is the unit designation, e.g., DPA0HM, 3.

MFDSIZ,8

The number of blocks allocated to the MFD by the refresher in each file structure. The MFD can be longer than this but there is a speed advantage to consecutive blocks. Increase this value if the MFD is normally longer than 8 blocks.

LIMLVL,0

The maximum number of nested SFDs for this monitor. The maximum value for LIMLVL is 5.

MAXUSI,8

The maximum negative USETI for reading an extended RIB.

8.15 OCTAL DEFAULT VALUES

This section contains a description of the standard symbols and default octal values assumed by the MONGEN program. Section 8.15.1 lists those symbols defined in COMMON; and Section 8.15.2 lists those symbols defined in COMMOD. All symbols are listed in the order in which they are defined.

8.15.1 Symbols Defined in COMMON

A00CVN, 0

The customer version number.

A00MVN, 603

The major version number.

XPANDN,0

The value affects the listing of COMMON. If it is non-zero, COMMON MACRO expansions are listed.

APRSN,0

The serial number of the arithmetic processor.

DEFDEB,0

Defines the stop code conditions under which the monitor is automatically reloaded. The default value of 0 indicates that the monitor is reloaded with the STOP category of stop codes. A value of 100000000000 indicates that the monitor is reloaded with JOB stop codes; a value of 200000000000 indicates that the monitor is reloaded with DEBUG stop codes; and a value of

300000000000 indicates that the monitor is reloaded on all types of stop codes. If the value is 400000000000, auto-reload is disabled. If the value is 200000000000, the system stops if the CPU halts. (Refer to the specification STOPCD.RNO.)

M.WCH, JW.WMT

The WATCH bits used to set the initial WATCHing. Because LOGIN sets JBTWCH, this is useful only for lines that do not need LOGIN, that is those using INITIA.

bit 19 =	200000	=	Time of day started to wait
bit 20 =	100000	=	RUN time
bit 21 =	40000	=	WAIT time
bit 22 =	20000	=	Blocks read
bit 23 =	10000	=	Blocks written
bit 24 =	4000	=	Version numbers
bit 25 =	2000	=	MTA statistics

8.15.2 Symbols Defined in COMMOD

PRVFIL,057

The standard file protection code.

PRVUFD,775

The standard User File Directory (UFD) protection code.

SYRDPR,355000

This value is set by the refresher and it indicates non-privileged files on SYS: (HOME.SYS, SAT.SYS).

SYNRPR,357000

SYNRPR = 357000 indicates that privileged files are on SYS: (CRASH.EXE, SNAP.SYS, RECOV.SYS, BADBLK.SYS, SWAP.SYS). Used by the refresher.

MFDPRV,555000

The standard Master File Directory (MFD) protection code. All users can READ, LOOKUP, but not CREATE files. Set by the refresher.

SYSPRV,775000

The SYS User File Directory (UFD) protection code; the project-programmer number is 1,4. Project 1 members can READ, CREATE, LOOKUP files; others can READ and LOOKUP only. Set by the refresher.

BLKMAX,100000

The maximum number of blocks that can be transferred in one disk file operation (IOWD). This default value is so high that the effective limit is one cylinder boundary.

PRVSPL,077

The default protection code for spooled files.

PRVSYS,155

The default protection code for most files on SYS: (except files with the .SYS extension).

PRYSYS,157

The default protection code for .SYS file on SYS:.

8.15.3 Symbols Defined in COMDEV

MTDLPT,1

Standard magtape labels are ASCII.

8.16 SIXBIT DEFAULT VALUES

The following list is a description of the standard symbols and default SIXBIT values assumed by the MONGEN program. (Refer to the description of the DESTROY startup option in the HDWGEN section.)

M.QSTR,0

Force queues to be placed on a specific STR.

M.SF00,DSKA

The name of the first file structure to contain fixed head disk units (e.g., FHA, FHB, etc.) when the DESTROY startup option is invoked. The value (DSKA) may be any 1- to 4-character alphanumeric name beginning with a letter. The number of fixed head units in the structure is set by the associated decimal symbol M.ZF00. Note that the DEC-distributed software sets the name of the first file structure, which contains all fixed head units, to DSKA.

M.SFxx,aaaa

The name of the second through sixteenth structure containing fixed head disk units (where xx =01....15, and aaaa is any 4-character alphanumeric name beginning with a letter). The number of fixed head units in the structure is set by the associated decimal symbol M.ZFxx. Note that the DEC-distributed software does not define these symbols, because it assumes that all fixed head units are incorporated into one structure, called DSKA.

M.SD00,DSKB

The name of the first file structure to contain disk pack units (e.g., DPA, DPB, etc.) when the DESTROY startup option is invoked by the operator. The value (DSKB) may be any 1- to 4-character alphanumeric name beginning with a letter. The number of disk pack units is set by the decimal symbol M.ZD00. Note that the DEC-distributed software sets the name of the first file structure, which contains all disk packs, to DSKB.

M.SDxx,aaaa

The name of the second through sixteenth structure containing disk pack units (where xx =01....15, and aaaa is any 4-character alphanumeric name beginning with a letter). The number of disk pack units in the structure is set by the associated decimal

symbol M.ZFxx. Note that the DEC-distributed software does not define these symbols because it assumes that all disk packs are incorporated into one file structure called DSKB.

M.SSxx,aaaa

The name of the first file structure to contain RH10s/RS04s when the DESTROY startup option is invoked by the operator. The number of fixed head units in the structure is set by the associated decimal symbol M.ZS00.

M.SRxx,aaaa

The name of the first file structure to contain RH10s/RP04s when the DESTROY startup option is invoked by the operator. The number of fixed head units in the structure is set by the associated decimal symbol M.ZR00.

8.17 NON-STANDARD DEVICE PI ASSIGNMENT

Under ordinary circumstances when COMMON is assembled, devices are assigned to PI channels according to their group priority. (Refer to Table 8-1.) If you have at your installation a device not listed as a standard device in Table 9-1 and you have written your own Monitor Device Service Routine, you must specify the device mnemonic (in 3 characters or less) and designate an appropriate priority interrupt channel. You must answer all three questions as they apply to your configuration. The first question

TYPE "DEVICE-MNEMONIC,PI-CHANNEL" FOR SPECIAL DEVICES

requests special device service routines that do not need either a Channel Save Routine or a Device Data Block. The second question

TYPE "DEVICE-MNEMONIC,PI-CHANNEL, NO.-OF-DEVICES"

requests devices with special service routines that have a Device Data Block but no Channel Save Routine. The third question

TYPE "DEVICE-MNEMONIC,PI-CHANNEL, HIGHEST-AC-TO-SAVE"

requests devices with special service routines that have a Channel Save Routine, but no Device Data Block.

Special devices that you added during the HDWGEN dialogue are chained to the requested channel. To give a device the exclusive use of a channel, you respond to the "symbol,value" question with

UNIQn,1

where n is the priority interrupt channel to be reserved. (Refer to the UNIQn,1 entry in Section 8.14.1.)

One or more priority interrupt channels may be reserved for real-time devices with the RTTRP monitor call. These devices are completely controlled by user programs and have no specific code loaded with the monitor. To reserve a priority interrupt channel for use with RTTRP, you should respond to the "symbol,value" question with

RTCHn,1

where n is the priority interrupt channel to be reserved.

(Refer to the RTCHn,1 entry in Section 8.14.1 and to the DECsystem-10 Monitor Calls manual.)

I/O devices are grouped by their relative interrupt speeds. If any device of a particular group is present, a PI channel is assigned to that device according to its group priority. Group priorities for standard devices may be revised by rearranging the devices in INTTAB, which is in the COMMON source file.

Table 8-1
Device Groups for PI Channel Assignment

Device Mnemonic	Group	Name
DCB	A	136 data control for 270 disk
MTA MTB	B	TM10n magtape data channel
DCT	C	136 data control for 551 or 516 tape controls
DTA DTB	D	TD10 DECtape data channel
CDR	E	461 or CR10 card reader
APR	E	KI10, KA10, or 166 arithmetic processor
RTC	E	DK10 real-time clock (each CPU)
SCN	F	Terminal scanner
PTR	F	Paper-tape reader
LPT	F	Line printer
DTA	F	DECtape flag channel
MTA MTB	F	Magtape flag channel
CTY	F	Console terminal
NET	F	Remote devices
DSK	G	Disk flag channel
PEN	G	Light pen
PTP	G	Paper-tape punch
CDP	G	Card punch
PLT	G	Plotter
DIS	H	Display data channel
CLK	I	Scheduler, clock routines (always assigned to channel 7)

8.18 TERMINAL INTERFACE LINE NUMBERS

The DC10 data line scanner is capable of handling up to a total of 64 lines (physical ports). The lines are monitored by scanners of two types -- a DC10B or a DC10E. Each DC10B is designed to handle eight lines of terminal communications, and each DC10E is designed to handle eight lines of dataset control. When using a terminal through a dataset, both a DC10B and a DC10E line are required. The DC10E line interfaces the dataset control signals to system decipherable signals, and the DC10B line carries the teletype information.

When the monitor assigns terminal numbers to DC10 lines, only the DC10B lines receive numbers. The reason for this action is that each DC10E line must be paired with a DC10B line to function properly, making an additional number unnecessary.

Each installation's system administrator must determine which DC10E dataset controllers are wired to which DC10B lines. (Refer to Figure 8-2, where line numbers 10 through 17 are DC10B dataset lines that are hardwired to the DC10E controller lines 20 through 27.)

The sequence of line number assignments for DC76s is:

```
DC10  0
DC10  1
DC68  0
DC68  1
DC76  0
DC76  1

Remote lines

CTYs
PTYs
```

Figure 8-1 One DC10 with Two DC10Bs

Figure 8-2 One DC10 with One DC10B and One DC10E

Figure 8-3 One DC76 with 33 Lines

Figure 8-4 One DC10 with Two DC10Bs and One DC68 with Eight Lines

8.19 MONGEN ERROR MESSAGES

?ANSWER MUST BE ONE OR (ANS0, ANS1,...)

Your response to this question was not a legal response. Choose one of the responses within parentheses.

?ANSWER WITH ONE OF THE CHOICES WITHIN PARENS

You responded to a multiple choice question with an answer that was not one of the choices. Reanswer the question with one of the supplied choices typed within parentheses after the question.

?CANNOT BE SAME AS CPUn

When you responded with the serial number of a CPU, your response matched the response for another CPU. Retype your response and press the carriage return.

?DEVICE n NOT AVAILABLE

The device you requested is not available at this time. Select another device or wait until the desired device is ready.

?HIGHEST-AC-TO-SAVE MUST BE N OR LESS

You specified an illegal AC number in response to the question. Reanswer the question and press the RETURN key.

%MORE THAN 6 CHARACTERS

In answer to question number 9 within the Networks Configuration dialogue, you responded with a central site name longer than 6 characters. Reanswer the question with a central site name having fewer than 6 characters.

%MORE THAN 24 CHARACTERS

In answer to question number 4 within the Hardware Configuration dialogue, you responded with a system name longer than 24 characters. Reanswer the question with a system name having fewer than 24 characters.

?MUST BE IN RANGE MIN-MAX

You specified an answer that was not within the legal response range of min to max. Reanswer the question with a value that is within the legal range.

?NO DEFAULT RANGE ALLOWED, TYPE A NUMBER

In response to a question, you pressed the RETURN key. There is no default answer for this question. Reanswer the question by typing a response before pressing the RETURN key.

?NO DEFAULT VALUE ALLOWED

In answer to a question, you pressed the RETURN key. This question, however, does not have a default answer. Type an answer in response to the question before you press the RETURN key.

?NOT AVAILABLE IN x MONITOR

A feature was specified that is not available in the monitor you are generating. Check the response MONGEN typed after you typed R MONGEN; make sure that you are using the appropriate version of MONGEN.

?NOT DEV:FILE.EXT P,PN

Your response was not in the legal file specification format; retype your response and press the RETURN key.

?NOT DEVICE-MNEMONIC, PI-CHANNEL

Your response to the question was not in the desired format. Retype your response in the correct format.

?NOT DEVICE-MNEMONIC, PI-CHANNEL, HIGHEST-AC-TO-SAVE

Your response to the question was not in the desired format. Reanswer the question in the correct format.

?NOT DEVICE-MNEMONIC, PI-CHANNEL, NO.-OF-DEVICES

Your response to the question was not in the desired format. Reanswer the question in the correct format.

?NOT "SWITCH.VALUE" OR KEYWORD

Your response to the question was not legal. Reanswer the question and press the RETURN key.

?NOT "SYMBOL.VALUE"

Your response to the question was not in the legal format; reanswer the question and press the RETURN key.

?TYPE ENOUGH TO UNIQUELY DISTINGUISH ANSWER

You abbreviated an answer to a question. The abbreviation was not long enough to distinguish it from another possible answer. Reanswer the question without abbreviating the answer.

?TYPE OCTAL LINE NUMBER OR CTY OR CTY1 FOLLOWED BY A CARRIAGE RETURN

Your response to the question was not what MONGEN expected. Reanswer the question with a TTY line number, the word CTY, or the word CTY1.

?TYPE OCTAL M-N or M

Type a range of numbers or a single number in response to this question.

?TYPE OCTAL M-N,P OR M,P

Your response to the question was not in a legal format; reanswer the question with a range of values before pressing the RETURN key.

?TYPE ONE ANSWER FOLLOWED BY A CARRIAGE RETURN

You supplied more than one answer to the question. Type one answer and press the RETURN key.

?TYPE SINGLE NUMBER FOLLOWED BY A CARRIAGE RETURN

In response to the question you supplied more than one digit number, when only one digit is legal. Retype your response and press the RETURN key.

?UNKNOWN SWITCH

You have specified a switch that is unknown to MONGEN. Refer to the list of legal switches. Type one of them before pressing the RETURN key.

CHAPTER 9

ASSEMBLE MACRO FILES

It is always necessary that you assemble F, S, HDWCNF, TTYCNF, NETCNF, COMMON, COMDEV and COMMOD (and NETPRM and COMNET, if you have purchased network software) because they are configuration-dependent. The following command string can be used to assemble these files.

For KL10 systems only, type the following:

```
.COMPILE DTEPRM
```

For all systems, type the following:

```
.COMPILE F/COMP,S/COMP,HDWCNF+NETCNF+TTYCNF+<COMMON,COMDEV,COMMOD>
```

If you responded Y to the MONGEN question DO YOU WANT NETWORK SOFTWARE, type the following command line instead of the one above.

```
.COMPILE F/COMP,S/COMP,NETPRM/COMP,HDWCNF+NETCNF+TTYCNF+<COMMON,
COMDEV,COMNET,COMMOD>
```

It is important that F.MAC precede S.MAC because S has conditional assemblies depending on the contents of F.

If you are using a standard combination of feature test switch settings and DEC-supplied sources, you do not need to assemble the remainder of the bundled monitor modules because they have already been assembled and combined in a TOP?10.REL file (see tables on following pages).

If you are not using a standard combination of feature test switch settings or you have SOUPed in your own changes, you must assemble all the bundled monitor sources. The simplest way to do this is to compile indirectly the appropriate .CMD file (see tables on following pages). For example, to assemble all the bundled sources for a standard KI monitor, type:

```
.COMPILE @CONKI
```

You must assemble any unbundled software. To assemble monitors with the virtual memory option, substitute TOPV10.REL (KI10) or TOPW10.REL (KL10) for TOPI10.REL in the command line.

To assemble monitors with the DC44 option, issue the following command:

```
.COMPILE F, S, TYPSER
```

And then link your monitor in the prescribed fashion.

To assemble monitors with the DAS78 option, issue the following

command line:

```
.COMPILE F, S, D78INT
```

Then, link your monitor in the prescribed fashion. For installation instructions concerning the -11 portion of the DAS78 and D78SPL, carefully read D78MNT.RNO, DAS78.RNO, and DAS78.RND found on the unbundled distribution tape.

To assemble monitors with the XTCSER options, issue the following command:

```
.COMPILE F, S, XTCSER
```

Then, link your monitor in the prescribed fashion.

If you also want to create cross-reference (CREF) listings, assemble all the sources for your monitor with the CREF switch, i.e., /C. The simplest way to do this is to assemble the appropriate command files indirectly to produce .REL files and CREF input files. Then, CREF can generate the listings. (See the example below.)

The table below lists the different MACRO indirect command files for both bundled and unbundled software. The intermediate .REL file extensions are the extensions specified for the .REL files in the .CMD files.

CONFIGURATION	BUNDLED SOFTWARE FILENAME	INTERMEDIATE .REL FILE EXTENSIONS
KA-LUG	CONLUG.CMD	*.RLG
KA-Standard	CONKA.CMD	*.RLA
KI-LUG	CONLGI.CMD	*.RLH
KI-Standard	CONKI.CMD	*.RLI
KI-Virtual Memory	CONVI.CMD	*.RLV
KL-Virtual Memory	CONVL.CMD	*.RLW

After assembling the monitor sources, you may need to combine certain modules into a TOP?10.REL file. If you are not using a TOP?10.REL file from the distribution tape, because you have used nonstandard feature test switch settings or you have modified the DEC sources, you must create your own TOP?10.REL file.

To combine the assembled monitor modules and make TOPI10.REL for a KI system type:

```
.R PIP

*CMBKI@

.
```

Note that indirect PIP files exit directly to monitor level (. prompt). Therefore, you must specify R PIP or START after specifying an indirect command file name.

To produce the proper TOP?10.REL for your configuration, use the appropriate PIP indirect command files from the list below.

CONFIGURATION	SOFTWARE	.REL

	FILENAME	CREATED
KA-LUG	CMBLUG.CCL	TOPG10.REL
KA-Standard	CMBKA.CCL	TOPA10.REL
KI-LUG	CMBLGI.CCL	TOPH10.REL
KI-Standard	CMBKI.CCL	TOPI10.REL
KI-Virtual Memory	CMBVI.CCL	TOPV10.REL
KL-Virtual Memory	CMBVL.CCL	TOPW10.REL

EXAMPLE: For a standard KI system you would assemble the source files, produce a complete set of CREF files (cross referenced listings) on magtape, produce TOPI10.REL and a listing of the monitor's global symbols as follows:

```
.COMPILE/C@CONKI

.ASSIGN MTA LPT

.CREF

.R PIP

*CMBKI@
.
```

Save your terminal output from the CREF command so you will know the order of the files on the magtape.

Whenever you want to print the entire set of monitor source files, mount the tape created in the previous step and type:

```
.R PIP

*MTAn:(MW)=
*LPT:=MTAn:*.*
```

If you want to print a single file from the magtape, advance the tape to the proper position and PIP the file to the line printer. Use your terminal output that you saved from the CREF command to determine where the desired file is on the tape.

Then to get a listing of the monitor global symbols, you must run GLOB. To produce a GLOB listing for a standard KI monitor with network software and some unbundled software type:

```
.R GLOB

*COMMON,COMDEV,COMNET,COMMOD

*DSK:TOPI10.GLB=TOPI10$
```

where $ is an ESCAPE or ALTMODE.

If you assembled the sources with CONKI.CMD, add the extension .RLI to COMMON,COMDEV,COMNET, and COMMOD in the above command string.

CHAPTER 10

LOAD AND SAVE THE MONITOR

Whether or not you can load the monitor under timesharing using LINK-10 depends on how much user core is available. In general, if your installation has about 50K of user core, you should be able to load the new monitor using LINK-10. If you have significantly less user core than this, consult your software specialist for details on loading the monitor.

The following sequence of instructions loads and saves a monitor for a standard configuration with no unbundled software:

```
.R LINK

*/NOINITIAL /HASH:6000 YURMON/SAV,YURMON/MAP = /LOCALS -
#/MAXCOR:60K -
#,COMMON,COMDEV,COMMOD,TOP?10 /SEARCH /GO
```

The filename YURMON is an arbitrary name chosen for the monitor; you may use any file name. Specify the TOP?10 to correspond to your system configuration:

```
TOPG10 for KALUG
TOPA10 for KA standard
TOPH10 for KILUG
TOPI10 for KI standard
TOPV10 for KI-virtual memory
TOPW10 for KL-virtual memory
```

Note that COMMON, COMDEV, and COMMOD in this example were generated by the COMPILE commands at the beginning of Chapter 9, so their extensions are .REL. If an indirect compile was done on a .CMD file, the extension created by the .CMD file would have to be specified. For example, if .COM @CONKI was used, you would have to specify COMMON.RLI, COMDEV.RLI, and COMMOD.RLI.

The TOPI10.REL (or the appropriate TOP?10.REL) file can be the one from the monitor distribution tape or one created by assembling all the monitor sources with the proper .CMD file (see Chapter 9) and combining them with the proper .CCL file (necessary if you are using a nonstandard combination of feature test switch settings or you have SOUPed in your own changes). (See Chapter 8.)

If your monitor includes one or more unbundled options (other than virtual memory), restore the unbundled monitor modules using the following procedure. Repeat the procedure for each unbundled tape.

```
.R BACKUP

/TAPE MTxn          ;the tape drive with
                    ;the unbundled tape
```

```
                        ;on it.
     /RESTORE filename  ;for example, D78INT.MAC
     !                  ;BACKUP's indication that it
                        ;is busy
     "DONE
                        ;repeat above, beginning with
                        ;/TAPE for each unbundled tape
     ^C                 ;CTRL/C when you are finished.
```

Then, you should compile the files on the unbundled tapes. For example, to compile the D78INT and TSKSER options, you would use the following command line:

```
.COMPILE F, S, D78INT, TSKSER
MACRO:F
MACRO:S
MACRO:D78INT
MACRO:TSKSER
```

Lastly, you should type the following command line to load the monitor with unbundled software.

```
.R LINK

*/NOINITIAL/HASH:6000 YURMON/SAV,-
#YURMON/MAP = /LOCALS/MAXCOR:60K-
#COMMON, COMDEV, COMMOD, unbmod,...unbmod-
#TOP?10/SEARCH/GO
```

Where: unbmod can be COMNET,
TSKSER, TYPSER, XTCSER, and/or
D78INT.

The files included in each of the unbundled software packages are listed below:

Be sure that the unbundled package name (e.g., XTCSER, TYPSER, or D78INT) precedes TOP?10. This must be done so that .SYSINI, ONCE, etc. will be loaded last and, therefore, can be discarded after initialization.

Using the commands in the above examples, LINK will produce a load map named YURMON.MAP. The monitor save file will be YURMON.SAVE or YURMON.HGH and YURMON.LOW. These files must be converted to .EXE files before they can be loaded with BOOTS. This can be accomplished by using the FILEX program or the monitor commands GET followed by NSAVE.

Note that LINK-10 allows you to load and save a program in the same command string. Also, certain switch settings can speed up the loading process. MAXCOR:60K is about the minimum core necessary for loading the monitor; if no parameter is set, however, LINK-10 will expand to use up to one half the user core. Using a HASH size of 6000 is an upper limit which should work for any system. For the sake of economy, if you have a smaller system, you should try smaller HASH values. LINK-10 will work without specifying either of these parameters; however, they may speed up the loading process if used. For a complete definition of all switches refer to the LINK-10 manual.

Then, if you have built a two-segment monitor, you must convert your monitor .HGH and .LOW files to an .EXE file (and your system must support .EXE files). Type:

```
.R FILEX
```

```
*YURMON.EXE=YURMON.HGH
```

If you choose to have .EXE file support with a single segment monitor, type:

```
.R FILEX

*YURMON.EXE=YURMON.SAV
```

Virtual Memory

VMSER.MAC	The 6.03 monitor source file that implements virtual memory.
TOPV10.REL	The combined .REL files for KI10 virtual memory monitors.
TOPW10.REL	The combined .REL files for KL10 virtual memory monitors.
CONVI.CMD	The command files needed for assembling KI10 virtual memory monitors.
CMBVI.CCL	The command files needed to create the combined .REL files for KI10 virtual memory systems.
CONVL.CMD	The command files needed for assembling KL10 virtual memory monitors.
CMBVL.CCL	The command files needed for creating the combined KL10 virtual memory .REL files.
MAKPFH.MAC MAKPFH.EXE PFH.VMX	The page fault handler for KI10 and KL10 virtual memory monitors.
DDT.VMX	The debugger to be used with virtual memory systems.
GET.* GET2.RNO	A user-mode program to .GET virtual memory executable programs.

DC44 Option

TYPSER.MAC	The 6.03 monitor source file needed for the DC44 interface.

DAS78 Option

The following file is a part of the monitor code.

D78INT.MAC	The 6.03 source file for the DAS70 interface.

The following files are part of the PDP-11 code.

DAS78.CTL	The control fle needed to assemble the PDP-11 code.
DAS78.P11	The source files for the DAS78 PDP-11 code.
DAS78.BIN	The executable DAS78 PDP-11 code.
DAS78.EX	The DDT11 file for the PDP-11 code.

The following files are part of QUEUE and QMANGR, for use with DAS78SPL.

D78SPL.CTL The control file to assemble D78SPL.

D78SPL.MAC The source code for D78SPL.

D78SPL.EXE The executable code for D78SPL.

The following files are used for DAS78 the modified LPTSPL. This program is used for 2780s, remote batch stations connected to the DECsystem-10. This modified LPTSPL can also be used to print on the local line printer.

SPOOL.CTL The control file for assembling a DAS78 LPTSPL.

SPOOL.D78 The source code for DAS78 modified SPOOL.

LPTSPL.EXE The executable code.

The following files support the DAS78 modified SPRINT.

This program is for use when using one 2780 as a Remote Batch Station to the DECsystem-10. This modified SPRINT will also be used to read cards from the local card reader.

SPRINT.CTL The control file for assembling a DAS78 SPRINT.

SPRINT.D78 The source code for DAS78 modified SPRINT.

SPRINT.EXE The executable code.

The following files support the PDP-11 Debugging program.

DDT11.MAC Source for DDT11.

DDT11.EXE Executable code.

DDT11.RNO DDT11 document.

The following files support MODEM diagnostics.

DQMODM.HLP A short document on how to use DQMODM.

DQMODM.BIN The executable code.

The following are DOCUMENTS.

DAS78.RNO The DAS78 "Cookbook" - WARNING: Preliminary version.

DAS78.RND

D78MNT.RNO Installation hints and other useful information.

The following are miscellaneous files contained in the DAS78 option.

C.MAC Needed for assembling QUEUE.

SCNMAC.MAC Needed for assembling QUEUE.

HELPER.REL Needed for LPTSPL, SPRINT, and QUEUE.

QUEUER.REL Needed for LPTSPL, SPRINT, and QUEUE.

SCAN.REL Needed for QUEUE (V4).

WILD.REL Needed for QUEUE (V5).

Note: The MACDLX assembler is required to assemble DAS78.P11, and the BOOT11 bootstrap is required to load code from the -10 into the -11 memory. Both these programs will be found on the main (bundled) 6.03 monitor distribution tape.

XTCSER Option

The following file is the XTCSER option.

XTCSER.MAC The 6.03 monitor source code for the DA28 driver.

CHAPTER 11

MAKE A COPY OF THE NEW MONITOR

This step is a precaution against losing the newly built monitor. If the monitor is accidentally destroyed, you need not rebuild it; you will have a copy in READIN mode available on tape.

Copy BOOTM, BACKUP.EXE, and your newly built monitor to magnetic tape. You must copy the files at 556 bpi for READIN mode on TM10 controllers and at 800 or 1600 bpi for TU70s. The entire tape must be written at one density.

The following steps create a backup monitor tape for a TM10 controller. First, be sure to read the BOOTM description in Chapter 18 on how to create BOOTM.REL and BOOTM.RDI.

```
.AS MTA0: BACKUP

.SET DENSITY MTA0:556

.SET BLOCKSIZE MTA0:2000

.REWIND MTA0:

.COPY MTA0:=BOOTM.REL

.SET BLOCKSIZE MTA0:128

.COPY MTA0:=BACKUP.EXE
```

Then, BACKUP your disk area that contains your new monitor by typing:

```
.R BACKUP

/DENSITY 556
/SAVE DSKB:[ppn]=DSKB:[ppn]*.*
```

The following steps create a backup monitor tape for TU70s:

```
.AS MTA0: BACKUP

.REWIND MTA0:

.COPY MTA0:=BOOTM.RDI

.COPY MTA0:=BACKUP.EXE
```

Then, BACKUP your disk area that contains your new monitor by typing:

```
.R BACKUP

/SAVE[1,2]*.*=[1,2]*.*
```

CHAPTER 12

COMMUNICATION SYSTEMS

Prepare for Communications Systems and Remote Stations

1. DC71 – Instructions for installing and usng a DC71 Communications System are in the Remote Station User's Guide in the DECsystem-10 Software Notebooks.

2. DC72 – Instructions for installing and using a DC72 Communications System are in the Remote Station User's Guide in the DECsystem-10 Software Notebooks.

3. DC76 – Instructions for installing a DC76 Communications System are in the Operators Guide in the DECsystem-10 Software Notebooks.

4. Installations that plan to install remote station software for the first time should contact their software specialist.

CHAPTER 13

UPDATE ACCOUNTING FILES

Under the phased installation concept, if you are running a current monitor, you have already converted the accounting files ACCT.SYS and AUXACC.SYS to 6.02 format using the latest version of REACT. If you have not yet converted the accounting files, LOGIN under [1,2] and convert to the new format at this time.

If you have no previously running monitor, you must generate the initial accounting files or augment the Digital Equipment Corporation-supplied accounting files using REACT.

1. ACCT.SYS - passwords and privileges for all users.

   To convert to the new format, simply read the old format ACCT.SYS with the R command and write it back with the W command. Be sure the latest version of REACT is on SYS:

   Type:

   ```
   .R REACT
   ```

   Optional: For help in running REACT type:

   ```
   */H
   ```

   then type:

   ```
   *R

   *W DSKA:[1,4]
   ```

   CAUTION

   Make sure that you are using the latest version of ACCT.SYS. If you have a copy of ACCT.SYS on several file structures, make sure each structure has the latest version.

   Also, do not use the passwords supplied in ACCT.SYS. The passwords are well known and using them could decrease system security.

2. AUXACC.SYS - disk file structure quotas for all users.

   Because device DSK: for any job is defined by the job's file structure search list, different jobs may have different, and possibly nonintersecting, definitions of DSK:. Therefore,

one job could reference a file as DSK:filename when another job could not (although that job could possibly reference the file by specifying the file structure on which the file exists).

To circumvent this problem, you or the system administrator can specify all public file structures in the AUXACC entries for all users. If you do not want a user to have space on a particular file structure, specify a logged-in quota of 0. In this case, no UFD is created for the user when he logs in, but the file structure is included in the user's search list so that he can always reference other files on that file structure as device DSK:.

To convert the AUXACC files, type the following to 6.03 REACT:

```
*A

*W DSKA:[1,4]
```

and to put a second copy on a slower file structure, type:

```
*W DSKB:[1,4]
```

CHAPTER 14

GET NEW MONITOR

You can now get the new monitor from disk with BOOTS or from magtape with BOOTM.

If you have a KL10 system, begin reading at Step B1. If you have a KA10 or KI10 system, begin reading below at Step A1. Note that all of the instructions in this chapter assume that you have a saved copy of the monitor called SYSTEM.EXE on [1,4] on either DSKA:, DSKB:, ..., DSK0.

Step A1 READIN BOOTS.

If the monitor was previously running, follow Situation A. If you have an RP04 and BOOTS was previously written on blocks 0 and 4 through 7 of the disk packs with WTBOOT, follow Situation B. Otherwise, follow Situation C.

Situation A: Monitor previously running

1. Set the NXM switch to off.

2. Set the memory address switches to 407.

3. Push the START button.

4. BOOTs responds with a carriage return. If there is no response, try Situations B or C.

5. Type a carriage return to load SYS:SYSTEM.EXE from any disk (DSKA through DSK0). If some other file, directory, or structure is desired, type a line in the following format:

   structure:file.ext[directory]

   BOOTs types a bell and a question mark if it cannot find the file, or if any errors occur while reading the file.

6. If successful, refer to step C1.

Situation B: RP04 Readin

1. Set the NXM and PAR STOP switch

2. Set the READIN switches to 270. (If you have multiple RH10s, you may have to set the READIN switches to 274 or 360).

3. On the READIN panel in the RH10, set the toggle switch to DISK, and set the thumbwheel to the READIN unit number. (If the DF10C is in KI mode, use an odd-numbered unit. If it is in KA mode or the RH10 is using a DF10, use an even-numbered

unit.)

4. Push the STOP button.

5. Push the RESET button.

6. Push the READIN button.

7. BOOTS responds with a carriage return. If there is no response, try the procedure for Situation C.

8. Type a carriage return to load SYS:SYSTEM.EXE from any disk (DSKA through DSK0). If you want a different structure, file, or directory from the default, type a line in the following format:

   structure:file.ext[directory]

   BOOTS types a bell and a question mark if it cannot find the file or if any errors occur while reading the file.

9. If successful, turn to step C1.

Situation C: Read BOOTS from paper-tape reader

1. Push the STOP button.

2. Push the RESET button.

3. Put the BOOTS tape in the paper tape reader.

4. Set the NXM switch to off.

5. Set the READIN switches to 104.

6. Push the READIN button. The paper tape should begin to move. If it does not, retry the procedure at least once.

7. BOOTS responds with a carriage return when loaded. If there is no response, retry the procedure at least once.

8. Type a carriage return to load SYS:SYSTEM.EXE from any disk (DSKA through DSK0). If you want a different structure, file, or directory from the default, type a line in the following format:

   structure:file.ext[directory]

   BOOTS types a bell and a question mark if it cannot find the file or if any errors occur while reading the file.

9. If successful, turn to Step C1.

Step A2 Readin a Monitor from Magtape Using BOOTM.

The following instructions describe how you get a KA10 or KI10 monitor from magtape with BOOTM. These instructions assume that BOOTM has been written as the first file on the magtape, BACKUP is the second file, and there is a BACKUP save set containing the monitor to be loaded.

Note that when BOOTM detects an error, it types a bell and a question mark followed by an error message. The possible error messages are listed in Chapter 16.

Read BOOTM from magtape. (If you have a dual-magtape system, you must use MTA for READIN.)

1. Push the STOP button.

2. Push the RESET button.

3. Mount the magtape on MTA unit 0 write-locked. (It must be mounted on unit 0 for TM10 controllers or on the lowest numbered ready unit for TU70s.)

4. For a TM10-controlled magtape, set the READIN switches to 340. For a TU70 unit, set the READIN switches to 220.

5. Set the NXM switch to off.

6. Push the READIN switch.

7. The magtape should move and read in BOOTM from the first file

BOOTM outputs the prompt characters BTM>. Then, you must give a file specification for the monitor you want to read; for example:

DSKB:603.EXE[1,4]

If you type a carriage return in response to BTM>, the default monitor (SYS:SYSTEM.EXE[1,4]) will be read in. This default file will be gotten from the magtape on the same unit from which the hardware READIN was done. If BOOTM was not read by hardware READIN from magtape, the default for controller is TM10 and the default for unit is 0.

Turn to Step C1.

Step B1 READIN BOOTS (KL10 Systems)

In most cases you should only have to check to see that the power light to the right of the load switches is glowing red. Otherwise, press the black power switch to the POWER ON position.

After powering up the system or deciding that you must do a complete reload, you have a few alternatives on how you load the console front-end processor. You can do a standard load from a disk pack or DECtape, or you can load using the swicth register. In most cases, you will load from a disk pack because it is much faster than DECtape. However, if dual-port hardware problems prevent loading from a disk pack, or if your system manager wants you to use software residing on a DECtape, you may need to load the system using the DECtape drive. Also, if you need to load the system using some non-standard hardware configurations or special software, you will have to use the switch register. The switch register allows you to load from any disk pack or DECtape and also enter the KL initialization operator dialogue (KLINIT). The KLINIT dialogue allows you to take such nondefault paths as configuring memory yourself, loading a bootstrap program from any file, and loading a nondefault monitor. The procedures for loading the front-end processor via a disk pack (Situation A), a DECtape (Situation B), or the switch register (Situation C) are described in the next three sections.

Situation A: Loading RSX-20F from Disk

This is the most common way to load the console front end. It assumes that the system power is ON, that all hardware and software have been correctly installed, and that the disk pack has been mounted properly.

Also, the disk pack containing both the TOPS-10 monitor and the RSX-20F front-end monitor must be on a dual-ported drive (controller select switch points to A/B), and the drive must be unit 0 with respect to both the central and front-end processors.

The operation is as follows:

1. Set the ENABLE/DISABLE load switch to ENABLE.

   This will enable the other three load switches.

2. Press the DISK load switch.

   This will cause the front-end processor to access the disk on drive 0 and load the RSX-20F monitor. The KL initialization program (KLINIT) is loaded and the default hardware configurations of cache and external memory are set up. The bootstrap program for the TOPS-10 monitor is then loaded into the central processor and started. The following is an example of the output you will receive on the console terminal.

```
RSX-20F V006A 0:16 21-JUN-76

[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]
KLI -- VERSION V002E RUNNING
KLI -- MICROCODE VERSION 131 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION:
                  CONTROLLER
ADDRESS  SIZE  RQ0  RQ1  RQ2  RQ3      CONTYPE INT
000000   512K  04   FOR  ALL           DMA20  4
KLI -- BOOTSTRAP LOADED AND STARTED
```

The first line of output tells you the version and the creation time and date of the RSX-20F monitor for the front end. The next two lines tell you that DB0: (the disk pack on drive 0) is the system device (SY0:) for the front-end tasks. The next eight lines are output by the KL initialization program. They document the version of KLINIT that is running and tell you that the KL10 microcode was successfully loaded, the cache was enabled, external memory was configured, and that the bootstrap program for the TOPS-10 monitor was loaded and started.

If an error occurs during the KL initialization program, you will receive an error message preceded by "KLI -- ?" and you will be placed in the KLINIT dialogue mode described in Appendix C of the KL Series Operator's Guide. (The loading of the TOPS-10 monitor is discussed in Step B2.)

Situation B: Loading RSX-20F from DECtape

This method of loading the console front end should be used if you cannot load from a disk pack or if you need a particular version of software that is only on DECtape. It assumes that the system power is ON, that the proper software exists on DECtape, and that the DECtape is mounted correctly on Unit 0. Be sure to leave the DECtape mounted while the system is running.

The operation is as follows:

1. Set the ENABLE/DISABLE load switch to ENABLE.

   This will enable the other three load switches.

2. Press the DECTAPE load switch.

   This will cause the front-end processor to access the DECtape on drive 0 and load the RSX-20F monitor. The KL initialization program (KLINIT) is loaded and the default hardware configurations of cache and external memory are set up. The bootstrap programs for the TOPS-10 monitor is then loaded into the central processor and started. The following is an example of the output you will receive on the console terminal.

```
RSX-20F V006A 0:16 21-JUN-76

[SY0: REDIRECTED TO DT0:]
[DT0: MOUNTED]
KLI -- VERSION V002E RUNNING
KLI -- MICROCODE VERSION 131 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION
                    CONTROLLER
ADDRESS  SIZE  RQ0  RQ1  RQ3  CONTYPE  INT
000000   512K  04   FOR  ALL   DMA20    4
KLI -- BOOTSTRAP LOADED AND STARTED
```

The first line of output tells you the version and the creation time and date of the RSX-20F monitor for the front end. The next two lines tell you that DT0: (the DECtape on unit 0) is the system device (SY0:) for the front-end tasks. The next eight lines are output by the KL initialization program. They give the version of KLINIT that is running and tell you that the KL10 microcode was successfully loaded, the cache was enabled, external memory was configured, and that the bootstrap program for the TOPS-10 monitor was loaded and started.

If an error occurs during the KL initialization program, you will receive an error message preceded by "KLI -- ?" and you will be placed in the KLINIT dialogue mode described in Appendix C of the KL Series Operator's Guide. (The loading of the TOPS-10 monitor is discussed in Section 3.3.)

Situation C: Loading RSX-20F via the Switch Register

You must load the console front end via the switch register if you need to do any of the following:

1. Enable specific cache or configure external memory yourself instead of using the default configurations.

2. Load a TOPS-10 bootstrap program from a file with a name other than BOOT.EXB; for example, BOOTM.EXB containing BOOTM, which loads a monitor from magnetic tape.

3. Load from a disk pack or DECtape that is not on unit 0.

The software for the front-end processor must reside on a DECtape or disk pack connected to the front end. If both the front-end software and the system monitor reside on the same disk pack, the pack must be mounted on a dual-ported drive and the controller select switch must be set to A/B.

The operation is as follows:

1. Set the ENABLE/DISABLE load switch to ENABLE.

   This will enable the other three load switches.

2. Set the appropriate switches (or bits) in the switch register.

   Switch 0 is mandatory when loading via the switch register. Switches 1 and 2 must be set on if you intend to use the KL initialization dialogue (KLINIT). If RSX-20F resides on a disk pack, set switch 7 on; if RSX-20F is on a DECtape, switch 7 must be off. Switches 8-10 must be set to specify the drive number of the disk or DECtape. (For a detailed description of all the bit settings in the switch register, see Table 14-1.)

Table 14-1
Switch Register Bit Definitions

Bit	Meaning
0	If this is set, the remaining bits are interpreted. You must set this to load via the switch register.
1,2	If both are set, the KL initialization operator dialogue (KLINIT) is loaded and started. This is the usual case when loading via the switch register. If either one is set, the RSX-20F is loaded; no communication is initiated between the -10 and the -11 processors at this time. If both are not set, the system is loaded much like it is via the DISK or DECTAPE load switch. However, because other bits are interpreted, you can specify the unit number of the bootstrap device in bits 8-10.
3-6	Currently not used, and must not be set.
7	If this is set, the bootstrap device is a disk pack on a dual-ported drive. If this is not set, the bootstrap device is a DECtape drive on the front-end processor.
8-10	These three bits allow you to specify the unit number of the bootstrap device (0 to 7). No bits set indicate unit 0; bits 9 and 8 set indicate unit 3.
11-14	Currently not used, and must not be set.
15	This indicates the action taken when an I/O error occurs during the bootstrapping. If this is set, the operation is retried indefinitely if an error occurs. If not set (the normal case), a halt occurs after ten unsuccessful retries.
16,17	Not used, and must not be set.

1. Press the SW/REG load switch.

   This will cause the front-end processor to access the disk drive (switch 7 set on) or the DECtape drive (switch 7 set off) with the unit number as specified in switches 8-10. The KL initialization program (KLINIT) is loaded and started and the default hardware configurations of cache and external memory are set up. The standard bootstrap program for the TOPS-10 monitor is then loaded into the central processor and started.

   The following is an example of the output you will receive on the console terminal if switches 0, 7, 8, and 9 are set on.

```
RSX-20F V006A 0:16 21-JUN-76

[SY0: REDIRECTED TO DB3:}
[DB3: MOUNTED]
KLI -- VERSION V002E RUNNING
KLI -- MICROCODE VERSION 131 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION:
                    CONTROLLER
ADDRESS  SIZE  RQ0  RQ1  RQ2  RQ3  CONTYPE  INT
000000   512K  04   FOR  ALL        DMA20    4
KLI -- BOOTSTRAP LOADED AND STARTED
```

   The first line of output tells you the version and the creation time and date of the RSX-20F monitor for the front end. The next two lines tell you that DB3: (the disk on unit 3) is the system device (SY0:) for the front end tasks. If bit 7 had not been set, the DB3: would have been DT3: for a DECtape. The next eight lines are output by the KL initialization program. They give the version of KLINIT that is running and tell you that the KL10 microcode was successfully loaded, the cache was enabled, external memory was configured, and that the standard bootstrap program for the TOPS-10 monitor was loaded and started. (The loading of the TOPS-10 monitor is discussed in Section 3.3.)

   If, in the previous example, you had also set switches 1 and 2 on, the console output would have been as follows:

```
RSX-20F V006A 0:16 21-JUN-76

[SY0: REDIRECTED TO DB3:]
[DB3: MOUNTED]
KLI -- VERSION V002E RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>
```

   Switches 1 and 2 set on specify that you wish to enter the KL initialization program (KLINIT) operator dialogue. KLINIT has just asked you the first question and is waiting for an answer. When you have answered all the applicable questions in the dialogue, the last message issued will be:

```
KLI -- BOOTSTRAP LOADED AND STARTED
```

   as in the previous example.

   (For a complete description of the KLINIT dialogue

messages, and examples, refer to Appendix C of the KL Series Operator's Guide.)

Step B2: Loading The Central Processor (TOPS-10 Monitor)

When the front-end processor has been loaded using any one of the three methods described in Section 3.2, the system informs you:

```
KLI -- BOOTSTRAP LOADED AND STARTED
```

The actual bootstrap program that has been loaded depends upon the method of loading the front end.

If you used the DISK load, DECTAPE load, or the SW/REG load with switches 1 and 2 off, you will have loaded the bootstrap program found in the file BOOT.EXB. This would usually be BOOTS, a program to load the monitor from a disk pack.

If you had used the KLINIT dialog to specify a non-default BOOT file, you could have loaded a program like BOOT, which will load the monitor from magnetic tape.

If you are loading the monitor from disk, follow Situation A. If you are loading the monitor from magtape, follow Situation B.

Situation A: Loading TOPS-10 from Disk

In response to the message:

```
KLI -- BOOTSTRAP LOADED AND STARTED
```

you can press the carriage return key and load the default monitor from the disk file SYSTEM.EXE or you can specify another file such as:

```
DSKB:TSTSYS.EXE
```

and load a different monitor.

When the TOPS-10 monitor is loaded, it will enter into an initialization dialogue with you to determine start-up options and conditions. These are covered in Step C1.

Situation B: Loading TOPS-10 from Magnetic Tape

In order to load the TOPS-10 monitor from a magnetic tape, the following prerequisites must be met:

1. The magnetic tape containing the monitor should be mounted on drive 0. If this is not possible, mount it on any drive but make sure that all other tape drives are set OFFLINE.

2. The bootstrap program to load a monitor from magnetic tape, BOOTM, must reside on the front-end load device; disk or DECtape.

3. Load the console front end via the SW/REG load procedure. (Situation C) with at least bits 0, 1, and 2 set ON. This will allow you to use the KLINIT dialog.

4. When KLINIT prompts you with:

```
KLI -- LOAD KL BOOTSTRAP[YES,NO,filename]?
KLI>
```

answer with the name of the file containing the magnetic tape bootstrap. For example, if BOOTM was in the file BOOTM.EXB, respond with:

```
KLI>BOOTM.EXB
```

KLINIT will load BOOTM, give you the message:

```
KLI -- BOOTSTRAP LOADED AND STARTED
```

and you would then be under control of the bootstrap program. When BOOTM outputs its prompt characters:

```
BTM>
```

you can give the file specification for the monitor you want to load, such as:

```
BTM>DSKB:MAGSYS.EXE[1,4]
```

or you can simply give a carriage return to get the default file, which is DSKB: SYSTEM.EXE[1,4] from the same magnetic tape.

When the TOPS-10 monitor is loaded, it enters into an initialization dialogue with the operator to determine the start-up options and conditions. These are covered in Step C1.

STEP C1: TOPS-10 Initialization Dialogue

When the TOPS-10 monitor is loaded, the system checks to see that the monitor and processor are compatible. If they are not, the following error message is issued:

```
?THIS MONITOR WAS BUILT FOR A xxxxxx
 AND WILL NOT RUN PROPERLY ON A yyyyyy.
```

where xxxxxx and yyyyyy can be KA10, KI10 or KL10. If this message persists, the system administrator should review the monitor generation procedure in the Software Notebooks.

If the load time diagnostic program SYSCHK was included in the system software at monitor generation time (determined during the MONGEN dialogue), the system will prompt with:

```
SYSCHK (N,Y):
```

A response of Y runs a 5 second diagnostic program that ensures the accessibility of all configured memory and system devices. A reply of N or a carriage return skips the diagnostic.

The system then types the monitor name, date and version number; for example:

```
ABC123 KL10 SYS#1234 03-1-77
```

When the system prompts:

WHY RELOAD:

reply with one of the following acceptable answers:

OPR	NXM CM
PARITY	HALT SA
POWER	LOOP NEW
STATIC	HUNG SCHED
HARDWARE	PM OTHER

If you do not reply within 60 seconds, OTHER is assumed. (Refer to Chapter 14 for the meanings and usage of the above replies.) The reply is stored in the system error file (ERROR.SYS) and can be retrieved at a later time using the SYSERR program. For example, a reply of:

WHY RELOAD:SCHED

will record that this particular monitor load was a scheduled reload.

When the system prompts:

DATE:

enter the numeric day and alphabetic month, in either order. The month may be abbreviated to any point where it is still unique. The year is optional. If entered, it must be either the full four digits or the last two. If the year is not entered, it is assumed to be the same as in the monitor creation date. If, for example, the monitor creation date was June 21, 1976, any of the following replies would be recorded as September 8, 1976.

DATE:SEP 8 1976
DATE:S 8 76
DATE:8 SEP

When the system prompts:

TIME:

enter a 4 digit time based on a 24-hour clock. For example,

TIME:2015

represents 8:15 PM.

When the system prompts:

STARTUP OPTION:

reply with one of the following:

QUICK	REFRESH LONG
GO	UNITED NOINITIA
DESTROY	CHANGE

A complete description of each startup option is contained in Chapter 16. The usual operator's reply is GO to start the system with a minumim amount of dialogue or QUICK to start the system immediately without changing any parameters.

The monitor is now ready for timesharing. INITIA is brought up automatically on systems with OPSER and an automatic restart file.

If you have a KA10 system, set the NXM switch OFF unless you are debugging and prefer to have the machine stop and display the memory address when non-existent memory is referenced.

CHAPTER 15

COPY NEW MONITOR TO SYS

You should now copy the new monitor to SYS for READIN with BOOTS from disk.

```
.COPY SYS:SYSTEM.EXE = 6.03 EXE
```

CHAPTER 16

ONCE DIALOGUE

In most instances, you should start your monitor with the GO, NOINITIA or QUICK STARTUP Option. The STARTUP Options are a portion of the ONCE dialogue, which is described in this chapter.

16.1 INTRODUCTION

The ONCE-Only dialogue (Version 662) is an interactive program used by the operator at system startup to set or alter a number of important system parameters. These parameters include the date, time of day, and most of the disk file structure information.

You respond to a series of questions asked during the ONCE-Only dialogue by typing your responses, one at a time, in conversational mode.

Before starting the system you should:

1. Read this chapter to acquaint yourself with the current version of the ONCE-Only dialogue format.

2. Decide which parameters you wish to set or alter when the system is started.

3. Be prepared to answer the required ONCE-Only dialogue questions by familiarizing yourself with your installation's configuration and the content and format of individual questions.

The 6.03 version of the ONCE-Only dialogue permits you to answer only those questions directly related to the parameters that you wish to define or alter in some way. The rest of the parameters are automatically set according to a DEC-supplied or an installation-defined standard. (Some parameter defaults can be modified by the system programmer at individual installations during the MONGEN dialogue program.) (Refer to Chapter 8 for a description of MONGEN.)

16.1.1 Summary of STARTUP Options

You have a choice of eight STARTUP Options. They are summarized here and then described in the remainder of this chapter.

QUICK	To start the system quickly without changing any parameters. (Refer to Section 16.2.)

NOINITIA To start the system quickly without setting any new parameters and without running INITIA. (Refer to Section 16.2.)

GO To check to see if everything is in order and to start the system with a minimum of dialogue. (Refer to Section 16.3.)

DESTROY To automatically restructure and refresh all disks according to a predetermined set of standards. (Refer to Section 16.4.)

REFRESH To explicitly refresh selected file structures without changing other system parameters. (Refer to Section 16.5.)

UNITID To change selected unit IDs without changing other system parameters. (Refer to Section 16.6.)

CHANGE To explicitly set or change selected file structure parameters. (Refer to Section 16.7.)

LONG To explicitly set all parameters and restructure the file system in a non-standard way. (Refer to Section 16.8.)

You should select the LONG STARTUP Option only if there is no other alternative. You are encouraged to use one or more of the other seven STARTUP Options (the simplest combination for their purposes), and to accept the system standard values whenever possible. Note that the STARTUP OPTION: question is repeated after you define some of the parameters. This permits you to define a second set of parameters (e.g., DESTROY, REFRESH, UNITID, or CHANGE) or to start the system (QUICK or GO).

The first eight steps described in Section 16.2.2 are common to all system startups regardless of which option you choose. You must perform these steps correctly before the ONCE-only dialogue asks you for the STARTUP Option. The first eight steps are listed in Section 16.2.2 as they apply to all STARTUP Options.

16.1.2 Special Considerations

The software supports the KA10, KI10, and KL10 processors. In general, the procedures are the same for all systems. The primary difference between the KA10 and the KI10 is the physical layout of the console. Where the KA10 console has rocker switches, the KI10 console has lighted pushbutton switches but the switch functions are the same. The instructions in this document use the following conventions when referring to the ON and OFF positions of the switches:

	KA10 Console	KI10 Console
Switch ON	Front (or bottom) of rocker switch is pressed.	Lighted
Switch OFF	Back (or top) of rocker switch is pressed.	Not Lighted

In addition, the following special steps should be performed with a KI10 system before beginning the READIN procedure.

1. Check to see that the MAINT light is OFF. If it is not, check that the following switches are OFF:

   PARITY STOP
   FM MANUAL
   MEM OVERLAP DIS
   MARGIN ENABLE
   SINGLE PULSE
   SINGLE INSTRUCTION

2. Make sure that the DATA and ADDRESS switches are operating properly. That is, when the switch is pressed the indicator is turned either off or on, the opposite to what it had been. If they do not work properly, make sure that the CONSOLE LOCK and the CONSOLE DATA LOCK switches are OFF.

3. Under normal circumstances systems with a KI10 processor should be run with the switches set as follows:

   a. NXM STOP switch OFF

   b. EXEC PAGING switch ON

   c. USER PAGING switch OFF
      (These paging switches should be set so that the addresses examined by the EXAMINE switch are monitor (EXEC mode) addresses instead of user program (USER mode) addresses.)

The NXM FLAG and processor clock PIA indicators are located on different bays.

1. On the KA10 the NXM FLAG and processor clock PIA indicators (PIA33, PIA34, and PIA35) are located on Bay 1, the left-most bay, farthest from the console. They are in the second row of lights, below the register labeled CPA.

2. On the KI10, the NXM FLAG and processor clock PIA indicators (APR CLK PIA) are located on Bay 3, the same bay as the console. They are in the bottom row of lights.

16.1.3 Special Multiprocessing Considerations

Under ordinary circumstances, multiprocessing systems do not require any special startup procedures. CPU1, the secondary processor, waits and automatically starts after CPU0, the primary processor, is started. However, if the system is started after a crash, then the procedure depends upon which CPU crashed.

16.1.4 Conventions Used in this Chapter

1. Errors messages

   ONCE-Only error messages are preceded by either a question mark (?) or a percent sign (%). Messages preceded by a question mark are fatal unless corrective action is taken.

Messages preceded by a percent sign are warnings.

2. Carriage Return

<CR> indicates that you should type a carriage return. Because most operator typeins must be terminated by carriage return, <CR> is used to indicate a blank line and for emphasis when other terminators, such as altmode, are also possible.

3. File Structure

STR is an abbreviation for file structure.

16.2 STARTUP OPTION: QUICK aND NOINITIA

The QUICK option enables you to start up the system quickly, without altering any system parameters and without any further dialogue. After listing off-line disk units, the system starts running.

This option is recommended for startups when speed is important, when file structure organization and other parameters need not be altered, or after you have set selected parameters by using another option, and you are ready to start the system.

The NOINITIA option is identical to QUICK, except that INITIA is not run.

Note that if ONCE-Only encounters problems in trying to start the monitor, the LONG dialogue is automatically invoked. (Refer to Section 16.10 for error messages and to Section 16.8.3 for a description of the LONG dialogue questions.)

16.2.1 Frequency

The QUICK (or GO) option is invoked everytime the monitor is reloaded into the machine.

16.2.2 Summary of Steps

1. You get the monitor with BOOTM or BOOTS. (Refer to Chapters 2 and 3.)

2. The system checks to see that the monitor and processor are compatible. If not, an error message is typed and the program halts.

3. The system asks if you wish to run the loadtime diagnostic program, SYSCHK.

   ```
   SYSCHK(N,Y):
   ```

   Note that this is asked only if the SYSCHK program has been included as a part of the system software (as determined by the system programmer during the MONGEN dialogue, refer to Chapter 8).

   USER RESPONSE: N OR <CR> to skip the diagnostic.

4. The system types the name of the monitor and creation date; for example:

   ```
   6.03 SYS #160 3-17-77
   ```

5. The system asks for the reason for the reload.

   ```
   WHY RELOAD:
   ```

   USER RESPONSE: NEW

   You answer with one of the following acceptable answers depending on your reason. (Refer to Section 16.9 for an explanation of these answers.)

```
OPR       LOOP
PARITY    HUNG
POWER     PM
STATIC    CM
HARDWARE  SA
NXM       NEW
HALT      SCHED
          OTHER
```

6. The system asks for the date.

   DATE:

   USER RESPONSE: MAR 17 1977

   You type the date as the name of the month (January-December) and the numerical day of the month (1-31) in any order. (The name of the month may be shortened as long as the abbreviation is unique.) The year is optional. If included, the year must be typed as a 4-digit number (1977) or a 2-digit abbreviation (77) following the month and day. If omitted, the year is assumed to be the same as the year the monitor was created. Examples of acceptable dates are:

   ```
   MARCH 17 1977
   MAR 17
   17 MAR
   ```

7. The system asks for the time.

   TIME:

   USER RESPONSE:0843

   You type the time based on a 24-hour clock, e.g., 0843=8:43 A.M. and 1345=1:45 P.M.

8. The system checks to see if all of memory is accessible.

9. ONCE asks for your choice of

   STARTUP OPTION:

   USER RESPONSE: QUICK

   For a description of the other responses, refer to the list below:

   ```
   GO       Section 16.3
   DESTROY  Section 16.4
   REFRESH  Section 16.5
   UNITID   Section 16.6
   CHANGE   Section 16.7
   LONG     Section 16.8
   ```

10. ONCE lists off-line units; for example:

    ```
    %xxxx IS OFF-LINE
    %yyyy IS OFF-LINE
    ```

    (Note that you have no opportunity to change the status of these units.)

11. ONCE checks to see if there are controllers off line or if any units are write locked. If so, messages are transmitted to the operator. Otherwise, if everything is in order, the monitor starts running the null job and initiates timesharing, usually via INITIA, OPSER, and an automatic STARTUP file. If you typed NOINITIA, a . is printed and you must log in. Otherwise, you are automatically logged in.

16.2.3 Examples

Example 1

```
SYSCHK (N,Y): Y

MEMORY MAP=
FROM    TO SIZE/K
000000 537777 176
CONTROLLER MTA IS UNACCESSIBLE.

  6.03 SYSTEM #160 4-12-77
WHY RELOAD: OTHER ;MANUAL EXAMPLE
DATE: 4 MAY
TIME: 0045

STARTUP OPTION: QUICK

%DPA6 IS OFF-LINE

%DPB0 IS OFF-LINE

  6.03 SYSTEM #160 4-12-77
DSKN:  System #160  Initia types
.                   the text contained
.                   in STR.TXT.
.
.LOGIN[1,2]         ;This is typed automatically
.R OPSER
[OPRPAF PROCESSING AUTO COMMAND FILE]
00:45:24(0)
                     .
00:45:24(0)
                     .
00:45:32(0)
                     .
00:45:39(B\L1)
```

Example 2

```
BOOTS

6.03
SYSCHK (N,Y): N

  6.03 SYSTEM #160 4-19-77
WHY RELOAD:NEW
DATE: APRIL 28
TIME: 1100
```

```
     STARTUP OPTION: QUICK

     %DPA4 IS OFF-LINE

     %DPA5 IS OFF-LINE

     %DPA6 IS OFF-LINE

       6.03 SYSTEM #160 11:00:19 CTY

     .LOGIN[1,2]
     .R OPSER
     [OPRPAF PROCESSING AUTO COMMAND FILE]
                          .
                          .
                          .
```

Example 3

```
     SYSCHK (N,Y):  N

       6.03 SYSTEM #160 4-19-77
     WHY RELOAD: NEW
     DATE: APRIL 20
     TIME: 700

     STARTUP OPTION: NOINITIA

     .
```

16.3 STARTUP OPTION: GO

When you specify the GO option, ONCE-Only checks to see if everything is in order, and starts the system with a minimum of dialogue. After you respond to questions asking if specific off-line units are to be on line, off line, or down, the system is started.

Note that if ONCE-Only encounters problems in trying to start the monitor, then the LONG dialogue is automatically invoked. Refer to Section 16.10 for error messages and to Section 16.8.3 for a description of the LONG dialogue questions.

16.3.1 Frequency

The GO (or QUICK) option must be invoked every time the monitor is reloaded into the machine.

16.3.2 Summary of Steps

Steps 1 through 8 are described in Section 16.2.2, because they are common to all STARTUP Options.

9. ONCE asks for your choice of

```
          STARTUP OPTION:
```

STARTUP OPTION: GO

USER RESPONSE: GO

10. ONCE lists off-line units, if any, and then asks if off-line units are to remain off line or not.

```
%xxxx IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN?
(TYPE #)
```

USER RESPONSE: 1,2, or 3

11. ONCE checks to see if there are any off-line controllers or if there are any write-locked units. If so, messages are transmitted to the operator. Otherwise, if everything is in order, the monitor starts running the null job and initiates timesharing, usually via INITIA, OPSER, and an automatic startup file.

16.3.3 Examples

Example 1

```
  6.03 SYSTEM #160 4-2-77
WHY RELOAD: OTHER ;EXAMPLE
DATE: 4 MAY
TIME: 52

STARTUP OPTION: GO

%DPA6 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

3

%DPB0 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

  6.03 SYSTEM #160 00:52:46 CTY
.R OPSER
[OPRPAF PROCESSING AUTO COMMAND FILE]
00:52:48(0)
        .
00:52:49(0)
        .
00:52:57(0)
        .
```

Example 2

```
BOOTS

6.03
SYSCHK (N,Y):

  6.03 SYSTEM #160 12-19-77
WHY RELOAD: SCHED
DATE: D 28
```

STARTUP OPTION: GO

```
TIME: 1120

STARTUP OPTION: GO

%DPA4 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%DPA5 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%DPA6 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

1

  6.03 SYSTEM #160 11-21-04 CTY
.R OPSER
[OPRPAF PROCESSING AUTO COMMAND FILE]
  .
  .
  .
```

16.4 STARTUP OPTION: DESTROY

The DESTROY option automatically restructures and refreshes all file structures according to a predetermined set of standards. A minimum of dialogue is encountered, because the file structure parameters are determined by the system programmer during the MONGEN dialogue program. (Refer to Chapter 8.)

The DESTROY option, as the name implies, destroys all existing file structures, then restructures and refreshes the disk units as directed by MONGEN. If the system programmer has not altered the values of the MONGEN symbols, the DESTROY option organizes the file system according to the "symbol, values" specified by the DEC-supplied software; that is, all fixed head disks are in the first file structure (called DSKA), and all disk pack units are in the second file structure (called DSKB), with 200K of swapping space allocated on each of the fixed head units, and on the first disk pack unit (as backup). (Refer to Chapter 8 for a description of the HDWGEN decimal and octal symbol-values that affect file structure organization.)

The DESTROY option is recommended for new installations starting up their systems for the first time and for existing installations using new disk units for the first time.

16.4.1 Frequency

After the file structure parameters have been established, they are written onto each structure in two places called the HOME blocks. Once this is done, it need not be done again. When the monitor is reloaded, it reads the HOME blocks and sets up the disk parameters automatically.

16.4.2 Summary of Steps

Steps 1 through 8 are described in Section 16.2.2, because they are common to all STARTUP Options.

9. ONCE asks for your choice of

   STARTUP OPTION:

   USER RESPONSE: DESTROY

   Existing structures are destroyed, new structures are created, and all disks are refreshed according to a predetermined set of values.

   A warning message is typed and confirmation is requested.

   %WARNING-ALL STRS WILL BE REFRESHED.
   PROCEED? (Y or <CR>)

   USER RESPONSE: Y

   When finished the following is typed

   HOME BLOCKS WRITTEN ON ALL UNITS
   START SYSTEM? (Y or <CR>)

   USER RESPONSE: Y or <CR>

   An answer of <CR> returns control to the STARTUP OPTION question again. A YES answer continues with step 10.

10. ONCE repeats the STARTUP question, to which you should respond QUICK (see Example 1). ONCE asks you to login.

    TO AUTOMATICALLY LOGIN UNDER [1,2] TYPE LOGIN

    USER RESPONSE: LOGIN

11. ONCE starts running the null job and initiates timesharing.

12. If a new monitor is being generated for the first time, you should return to Chapter 4.

16.4.3 Example

```
BOOTS

 6.03
 SYSCHK (N,Y):

  6.03 SYSTEM #160 12-13-77
 WHY RELOAD: SA
 DATE: 26 DEC
 TIME: 1300

 STARTUP OPTION:  DESTROY
 %WARNING-ALL STRS WILL BE REFRESHED.
 PROCEED?(Y OR <CR>)

 %FHA1 IS OFF-LINE
```

STARTUP OPTION: DESTROY

```
%DPA0 IS OFF-LINE

HOME BLOCKS WRITTEN ON ALL UNITS
START SYSTEM? (Y OR <CR>)Y

STARTUP OPTION: Q
TO AUTOMATICALLY LOG-IN UNDER [1,2] TYPE "LOGIN"
LOGIN
 .
 .
 .
```

16.5 STARTUP OPTION: REFRESH

The REFRESH option allows you to restore certain file structures to their initial condition (i.e., refresh them) without changing other system parameters. (Note that only HOME.SYS is required to describe the file structure. Once these have been defined via DESTROY or LONG, refreshing individual structures is very simple.)

16.5.1 Frequency

Ordinarily, structures need refreshing every two to three months. Refreshing may be required when:

1. Disks are full. When you wish to retain only recently accessed files, you save recently accessed files with BACKUP before refreshing and then restore them (with BACKUP) after refreshing.

2. System crashes have left a number of blocks not allocated to any file. Refer to the DSKRAT documentation for instructions on determining the number of lost blocks and recovering them without the need for refreshing the file structure.

3. Fragmentation of free blocks results in inefficient use of disk space, i.e., when free blocks on the disk are so scattered that long sequentially written files are using extended RIBs. (Refer to the DSKLST.RNO specification for information on interpreting the DSKLST output.)

16.5.2 Summary of Steps

Steps 1 through 8 are described in Section 16.2.2 because they are common to all STARTUP Options.

9. ONCE asks for your choice of

   ```
   STARTUP OPTION:
   ```

   USER RESPONSE: REFRESH

10. ONCE lists any off-line units and asks you to indicate which off-line units are to remain off-line.

    ```
    %xxxx IS OFF-LINE
    ```

STARTUP OPTION: REFRESH

DO YOU WANT IT TO BE 1)ON-LINE, 2) OFF-LINE, OR 3)DOWN?
(TYPE #)

USER RESPONSE: 1,2, or 3

11. ONCE checks to see if there are any off-line controllers or if there are any write-locked units. If so, messages are transmitted to the operator.

12. ONCE asks for the structures to be refreshed.

TYPE STR NAME TO BE REFRESHED (CR IF NONE, ALL IF ALL)

USER RESPONSE: ALL or individual structure name.

When the structures are refreshed, control returns to the STARTUP OPTION question. You can enter another STARTUP Option (such as DESTROY, UNITID, CHANGE, or LONG) or you can start the system (QUICK or GO).

16.5.3 Examples

Example 1

```
BOOTS

6.03
SYSCHK (N,Y):

     6.03 SYSTEM #160 12-19-77
WHY RELOAD: NEW
DATE: DEC 28
TIME: 1250

STARTUP OPTION: REFRESH
TYPE STR NAME TO BE REFRESHED (CR IF NONE, ALL IF ALL)
DSKH
TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)
DSKX
TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)
DSKX
TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)

STARTUP OPTION: QUICK
TO AUTOMATICALLY LOG-IN UNDER [1,2] TYPE "LOGIN"
LOGIN
     .
     .
```

Example 2

```
SYSCHK (N,Y):N

  6.03 DUAL CPU 11-21-77
WHY RELOAD: SA
DATE: 4 DEC
TIME: 1050

STARTUP OPTION: REF
```

STARTUP OPTION: REFRESH

```
%DPA6 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%DPB0 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%NEED REFRESHING:
DSKA,DSKB,DSKC
TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)
DSKA
TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)

STARTUP OPTION: Q
TO AUTOMATICALLY LOG-IN UNDER [1,2] TYPE "LOGIN"
LOGIN

  6.03 DUAL CPU 1:06:02

.LOG

.INITIA

  6.03 DUAL CPU 01:06:14 CTY
.R OPSER
[OPRPAF PROCESSING AUTO COMMAND FILE]
  .
  .
  .
```

16.6 STARTUP OPTION: UNITID

The UNITID option allows you to change selected unit IDs, without changing any other parameters.

16.6.1 Frequency

After the file structure parameters have been established, they are written onto each structure in two places called the HOME blocks. Once this is done, it need not be done again. When the system is reloaded, the monitor reads the HOME blocks and sets up the disk parameters automatically.

16.6.2 Summary of Steps

Steps 1 through 8 are described in Section 16.2.2, because they are common to all STARTUP Options.

9. ONCE asks for your choice of

```
     STARTUP OPTION:

USER RESPONSE: UNITID
```

10. ONCE lists any off-line units and asks you to indicate which off-line units are to remain off-line.

    %xxxx IS OFF-LINE

    DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

    USER RESPONSE: 1,2, or 3

    ONCE checks to see if there are any off-line controllers or if there are any write-locked units. If so, messages are transmitted to the operator.

11. ONCE asks if there are any physical unit names and unit IDs to be changed.

    CHANGE ALL UNIT ID's (Y OR <CR>)

    USER RESPONSE: Y OR <CR>

    When you specify Y, ONCE lists each unit and asks for the I.D.:

    AFTER EACH UNIT NAME, TYPE THE I.D.

    xxx(aaaa):

    USER RESPONSE: ABCD

    yyyy(bbbb)

    USER RESPONSE: EFGH

    zzzz(cccc):

    USER RESPONSE: IJKL

    When you respond with <CR>, ONCE asks, for each unit, the unit name and its I.D.

    TYPE UNIT NAME, A COMMA, AND NEW UNIT ID FOR EACH DESIRED UNIT.
    (EXTRA <CR> WHEN THROUGH)

    USER RESPONSE: xxxx, ABCD <CR>
    yyyy, EFGH <CR>
    <CR>

12. If HOME blocks are to be written, ONCE asks for the physical unit and then indicates when HOME blocks are written.

    TYPE PHYSICAL UNIT TO WRITE HOME BLOCKS (EXTRA CR WHEN THROUGH)
    (CR IF NONE, ALL IF ALL ;"ALL" IS NORMAL CASE)

    USER RESPONSE: ALL

    HOME BLOCKS WRITTEN

    When HOME blocks are written, control returns to the STARTUP Option question. You can enter another option (such as DESTROY, UNITID, CHANGE, or LONG) or you can start the system

STARTUP OPTION: UNITID

(QUICK or GO).

16.6.3 Examples

Example 1

```
BOOTS

6.03
SYSCHK (N,Y):

  6.03 SYSTEM #160 4-19-77
DATE: MAY 28
TIME: 1130

STARTUP OPTION: UNITID
CHANGE ALL UNIT ID'S? (Y OR <CR>)

TYPE UNIT NAME, A COMMA, AND NEW UNIT ID FOR EACH DESIRED UNIT.
(EXTRA <CR> WHEN THROUGH)

DPA4,UNIT4

DPA5,UNIT5

TYPE PHYSICAL UNITS TO WRITE HOME BLOCKS (EXTRA CR WHEN THROUGH)
(CR IF NONE, ALL IF ALL ;"ALL" IS NORMAL CASE)
DPA4
DPA5

HOME BLOCKS WRITTEN

STARTUP OPTION: Q

  6.03 SYSTEM #160 11:32:43 CTY
.R OPSER
[OPRPAF PROCESSING AUTO COMMAND FILE]
  .
  .
  .
```

Example 2

```
SYSCHK (N,Y): N

     6.03 SYSTEM #160 12-02-77
WHY RELOAD: SA
DATE: 4 DEC
TIME: 55

STARTUP OPTION: UNITID

%DPA6 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%DPB0 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)
```

STARTUP OPTION: UNITID

```
2
CHANGE ALL UNIT ID'S? (Y OF <CR>)Y
AFTER EACH UNIT NAME, TYPE THE I.D.

FHA0(GLZX):XLZG

FHA1(XZLG):GLZX

DPA0(RP03A):RP03A1

DPA1(RP03B):RP03B1

DPA2(3RPXYZ):RP03C1

DPA3(2RP023):
DPA4(2RP044):
DPA5(2RP042):
DPB1(2RP004):

TYPE PHYSICAL UNITS TO WRITE HOME BLOCKS (EXTRA CR WHEN THROUGH)
(CR IF NONE, ALL IF ALL ;"ALL" IS NORMAL CASE)
ALL

HOME BLOCKS WRITTEN

STARTUP OPTION: UNITID

%DPA6 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%DPB0 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2
CHANGE ALL UNIT ID'S (Y OR <CR>) <CR>

TYPE UNIT NAME, A COMMA, AND NEW UNIT ID FOR EACH DESIRED UNIT.
(EXTRA <CR> WHEN THROUGH)
FHA0,FHARD1
FHA1,SAM

TYPE PHYSICAL UNIT TO WRITE HOME BLOCKS
     (CR IF NONE, ALL IF ALL ;"ALL" IS NORMAL CASE)

BEFORE "HOME" BLOCKS ARE WRITTEN

TYPE STR NAME FOR A LIST OF ITS PARAMETERS(CR IF NONE, ALL IF
ALL)

TYPE PHYSICAL UNIT NAME TO LIST ITS PARAMETERS(CR IF NONE, ALL IF
ALL)

DO YOU WANT TO CHANGE ANY DISK PARAMETERS(CR IF NO)

TYPE PHYSICAL UNIT TO WRITE HOME BLOCKS
(CR IF NONE, ALL IF ALL ;"ALL" IS NORMAL CASE)
ALL

HOME BLOCKS WRITTEN

STARTUP OPTION: GO
```

.
.
.

16.7 STARTUP OPTION: CHANGE

The CHANGE option allows you to set or change selected parameters on specified structures or units. The parameters are changed, sometimes causing file structures to be refreshed, but no restructuring (creating or deleting) of structures is performed. This option asks you questions about the following:

1. File structure parameters
2. Physical unit parameters
3. Active swapping list
4. System search list

Note that if any changes require HOME blocks to be written or disks to be refreshed, you are informed and asked for verification.

16.7.1 Frequency

After the file structure parameters have been established, they are written onto each structure in two places called the HOME blocks. Once this is completed, it need not be done again. When the monitor is reloaded, the monitor reads the HOME blocks and sets up the disk parameters automatically.

16.7.2 Summary of Steps

Steps 1 through 8 are described in Section 16.2.2 because they are common to all STARTUP Options.

9. ONCE asks for your choice of

```
STARTUP OPTION:

USER RESPONSE: CHANGE
```

10. ONCE lists off-line units, if any, and then asks if off-line units are to remain off-line or not.

```
%xxxx IS OFF-LINE
DO YOU WANT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN?
(TYPE #)
```

    ONCE checks to see if there are any off-line controllers or if there are any write-locked units. If so, appropriate messages are transmitted to the operator terminal.

11. ONCE asks questions about file structure parameters, physical unit parameters, the active swapping list, and the system search list. You can accept the standard default answers by responding to each question with a carriage return. (See

example 1 in Section 16.7.3.)

Or, you can answer the questions individually, thereby setting parameters in a non-standard way. If you choose to set the parameters in a non-standard way, the appropriate subset of "long dialogue" questions is asked. (See examples 2 and 3 in Section 16.7.3 and the description of the LONG option, Section 16.8.2.)

When the parameters have been set, control returns to the STARTUP Option question. You can start the system via quick or GO or continue with another option.

16.7.3 Examples

Example 1

```
BOOTS

6.03
SYSCHK (N,Y):

     6.03 SYSTEM #160 12-19-77
WHY RELOAD: NEW
DATE: DEC 28
TIME: 1230

STARTUP OPTION: CHANGE

%DPA4 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%DPA5 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #9

2

%DPA6 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

TYPE STR NAME TO CHANGE ITS PARAMETERS(CR IF NONE, ALL IF ALL)

TYPE PHYSICAL UNIT NAME TO CHANGE ITS PARAMETERS(CR IF NONE, ALL
IF ALL)

DO YOU WANT TO CHANGE THE ACTIVE SWAPPING LIST?

DO YOU WANT TO CHANGE THE "SYS" SEARCH LIST?

STARTUP OPTION: QUICK
     .
     .
     .
```

Example 2

STARTUP OPTION: CHANGE

```
BOOTS

6.03
SYSCHK (N,Y):

     6.03 SYSTEM #160 12-19-77
DATE: DEC 28
TIME: 1250

STARTUP OPTION: CHANGE

TYPE STR NAME TO CHANGE ITS PARAMETERS(CR IF NONE, ALL IF ALL)
DSKX

AFTER EACH PRINTING OF CURRENT VALUE, TYPE NEW VALUE OR CR

PARAMETERS WHICH MAY BE CHANGED WITHOUT REFRESHING
# OF CONSECUTIVE BLOCKS TRIED FOR ON OUTPUT = 30
MIN = 1 MAX = 80000

SUM OF BLOCKS GUARANTEED TO USERS = 0
MIN = 0 MAX = 80000

# BLOCKS ALLOWED FOR OVERDRAW PER USER = 500
MIN = 0 MAX = 80000
1000

PARAMETERS WHICH MAY NOT BE CHANGED WITHOUT REFRESHING
K FOR CRASH.SAV = 96
MIN = 0 MAX = 256
0

BLOCKS PER CLUSTER = 5
MIN = 1 MAX = 511

THEREFORE BITS PER CLUSTER ADR. = 13
THEREFORE BLOCKS PER SUPER-CLUSTER = 5
THEREFORE SUPER-CLUSTERS PER UNIT = 8000

BITS PER CLUSTER COUNT = 9
MIN = 1 MAX = 18

THEREFORE BITS PER CHECKSUM = 14

TYPE STR NAME TO CHANGE ITS PARAMETERS(CR IF NONE, ALL IF ALL)

TYPE PHYSICAL UNIT NAME TO CHANGE ITS PARAMETERS(CR IF NONE, ALL
IF ALL)

DO YOU WNAT TO CHANGE THE ACTIVE SWAPPING LIST?

DO YOU WANT TO CHANGE THE "SYS" SEARCH LIST?

TYPE PHYSICAL UNIT TO WRITE HOME BLOCKS
(CR IF NONE, ALL IF ALL ;"ALL" IS NORMAL CASE)
DPA4
DPA5

HOME BLOCKS WRITTEN

%NEED REFRESHING:
DSKX
TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)
```

STARTUP OPTION: CHANGE

```
DSKX
TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)

STARTUP OPTION: Q
TO AUTOMATICALLY LOG-IN UNDER [1,2] TYPE "LOGIN"
```

Example 3

```
SYSCHK (N,Y): Y

MEMORY MAP =
FROM      TO SIZE/K
000000 537777 176
CONTROLLER MTA IS UNACCESSIBLE

  6.03 SYSTEM #160 12-02-77
WHY RELOAD: OTHER ;ONCE EXAMPLE
DATE: 4 DEC 1977
TIME: 46

STARTUP OPTION: CHANGE

%DPA6 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

%DPB0 IS OFF-LINE
DO YOU WANT IT TO BE 1)ON-LINE, 2)OFF-LINE, OR 3)DOWN? (TYPE #)

2

TYPE STR NAME TO CHANGE ITS PARAMETERS (CR IF NONE, ALL IF ALL)

DO YOU WANT TO CHANGE THE ACTIVE SWAPPING LIST?
Y
FOR EACH CLASS TYPED PHYSICAL UNIT NAMES(EXTRA CR WHEN DONE)
CLASS 0
FHA0
FHA1

CLASS 1
DPA0

CLASS 2
DPA0
?UNIT ALREADY IN ACTIVE SWAPPING LIST
DPB0
?UNIT HAS NO SPACE ALLOCATED FOR SWAPPING


DO YOU WANT TO CHANGE THE "SYS" SEARCH LIST?
Y
TYPE STR NAMES FOR "SYS" SEARCH LIST (EXTRA CR WHEN DONE)
DSKN
DSKA
DSKB
DSKC

TYPE PHYSICAL UNIT TO WRITE HOME BLOCKS
(CR IF NONE, ALL IF ALL ;"ALL" IS NORMAL CASE)
```

STARTUP OPTION: CHANGE

```
ALL

HOME BLOCKS WRITTEN

STARTUP OPTION: GO

  6.03 SYSTEM #160 12-2-77
.R OPSER
[OPRPAF PROCESSING AUTO COMMAND FILE]
00:49:19(0)
        .
00:49:20(0)
        .
00:49:28(0)
```

16.8 STARTUP OPTION: LONG

The LONG option allows you to explicitly set all system parameters, and to refresh and restructure the entire file system in a non-standard way. The entire "LONG dialogue", as described in Section 16.8.3, is invoked. Note that the exact sequence of operator dialogue depends on your answers to the individual questions. That is, the answers to certain questions cause ONCE-Only to branch in different directions. Section 16.8.3 follows the most commonly encountered path.

If ONCE encounters problems in trying to start the monitor, the LONG dialogue questions may be automatically invoked (with the QUICK and GO options).

16.8.1 Frequency

As stated in Section 16.1, you should choose the LONG option only when no other option or combination of options will suffice. For new systems, the preferred method is for you to specify the DESTROY option, followed by the CHANGE option (for individual exceptions to the standard).

16.8.2 Example

This example assumes that you accept all system defaults, i.e., you respond to all questions with a carriage return. (Section 16.8.3 illustrates a more complex situation.)

```
BOOTS

6.03
SYSCHK (N,Y):

          6.03 SYSTEM #160 3-19-77
DATE: MAR 28
TIME: 1255

STARTUP OPTION: LONG

IN THE FOLLOWING DIALOG, ALL NUMBERS ARE DECIMAL.
TYPE <CR> IF OK, OR A NEW NUMBER TO CHANGE VALUE.
```

STARTUP OPTION: LONG

```
# MONITOR BUFFERS = 6


TYPE PHYSICAL UNIT NAME TO LIST # BAD REGIONS(CR IF NONE, ALL IF
ALL)


DSK FILE STRUCTURES(STRS):
DSKA:FHA0(XLZG),FHA1(GLZX)
DSKB:DPA1(ONC501),DPA0(ONC517)
DSKC:DPA2(RP03A)
DSKN:DPA3(2RP023)
DSKX:DPA4(ONC554),DPA4(ONC566)
DSKH:DPA6(2RP)

UNITS IN ACTIVE SWAPPING LIST:
FHA0(0),FHA1(0)

STRS IN "SYS" SEARCH LIST:
DSKA,DSKN,DSKB,DSKC

TYPE STR NAME FOR A LIST OF ITS PARAMETERS(CR IF NONE, ALL IF
ALL)


TYPE PHYSICAL UNIT NAME TO LIST ITS PARAMETERS(CR IF NONE, ALL IF
ALL)

DO YOU WANT TO CHANGE ANY DISK PARAMETERS?(CR IF NO)

TYPE STR NAME TO BE REFRESHED(CR IF NONE, ALL IF ALL)

STARTUP OPTION: QUICK

      6.03 SYSTEM #160 12:56:33 CTY
DSKN:  System #160  INITIA types the
.                   text found in
.                   STR.TXT.
.

.LOGIN[1,2]         ;This is typed
                    ;automatically.
.R OPSER
[OPRPAF PROCESSING AUTO COMMAND FILE]
  .
  .
  .
```

16.8.3 Complete Description of Each "Long Dialogue" Question

NOTE

It is possible for an experienced operator to stop the typeout of a lengthy ONCE-Only question. When you type a character during ONCE-only typeout, a ^O is echoed and the remainder of the question is not typed. (The space character is recommended as

the character for you to type to stop output, because it is usually ignored as input.)

1. Get the monitor from the disk with BOOTS or from magtape with BOOTM. Refer to the earlier chapters of this manual.

2. The system compares the type of monitor (1040, 1050, 1055, 1070, 1080, 1090) and the type of processor (KA10, KI10, or KL10) for compatibility. If incompatible, the following message is typed and the monitor halts.

   THIS MONITOR WAS BUILT FOR A (KA10, KI10, KL10) AND
   WILL NOT RUN PROPERLY ON (KI10, KA10, KL10).

3. If the optional loadtime diagnostic SYSCHK is included in the system software (determined by a system programmer during the MONGEN dialogue), ONCE asks if you wish to run it at this time

   SYSCHK (N,Y):

   USER RESPONSE: N or <CR> to skip the diagnostic

   The loadtime diagnostic SYSCHK is a 5-second program that ensures the accessibility of memory and all devices on a configuration.

   The system types the name of the monitor and the creation date and asks for the reason for the reload. ONCE types

   6.03 SYS #2 3-1-77

   WHY RELOAD:

   You respond with one of the following acceptable answers or an abbreviation that uniquely describes it:

   OPR
   PARITY
   POWER
   STATIC
   HARDWARE
   NXM
   HALT
   LOOP
   HUNG
   PM
   CM
   SA
   NEW
   SCHED
   OTHER

   (See Section 16.9 for a detailed explanation of the WHY RELOAD: question.)

4. The system types the creation date and asks for today's date and time.

   DATE: MAR 17 1977

Type the date as the name of the month (January - December) and the numerical day of the month (1-31) in any order. (The name of the month may be shortened as long as the abbreviation is unique.) The year is optional. If included, it must be a 4-digit number (1977) or a 2-digit (77) abbreviation following the month and day. If omitted, the creation date of the monitor is assumed. Examples of acceptable input are:

```
SEPTEMBER 17 1977
SEPT 17
17 SEPT
S 17
```

If an incorrect format is detected, the ONCE-Only dialogue reasks the question in more detail:

```
PLEASE TYPE TODAY'S DATE AS MM-DD-YY:
```

NOTE

It is very important that you type in the correct date. If you type an incorrect date, user files will be written with the wrong creation and access dates. The automatic COMPIL, if the source file was created later than .REL file, will break down. More seriously, if your installation is purging files by date created or accessed, users' files could be incorrectly deleted. If you discover later that you typed in the wrong date but the system has not started running the null job yet (Step 32), you may restart the monitor at 400, reload it, or use the SET DATE command.

```
TIME:  0843<CR>
```

You type time based on a 24-hour clock, e.g., type 0843 <CR> for 8:43 AM, or 1345 <CR> for 1:45 PM.

If an incorrect format is detected, the ONCE-Only dialogue reasks the question in more detail:

```
PLEASE TYPE TIME AS HHMM:
```

As with the date, it is very important that you type in the correct time. You can change the time after the monitor has started to timeshare using the SET DAYTIM command. (Refer to the DECsystem-10 Operating System Command Manual in the DECsystem10 Software Notebook.) However, this practice is to be discouraged because it confuses the creation times of files and causes the accounting system to make incorrect charges for connect time. You can reload or restart the monitor if you detect the error before Step 31 (null job running).

If, after loading the monitor (Step 0), you are not asked the reason for the reload and the date and time, perform the following:

a. Check that the NXM STOP is off. If not (this is a

common error and is easily recovered), set if off.

b. Push CONTINUE. ONCE goes back to Step 2. Now you may respond to date and time queries.

If this procedure does not work, it may be that the monitor was written without a starting address. Try the following:

a. Set the address switches to 000400.

b. Press STOP, RESET, START (in that order).

c. Go back to Step 1 and respond to DATE, WHY RELOAD, and TIME queries.

5. ONCE checks to see if all of memory is accessible. The amount of accessible memory is determined by scanning memory. If the amount found is less than that specified when the monitor was built (by a MONGEN question), the following message is typed.

```
% MEMORY FROM XXXXXX TO YYYYYY IS OFF LINE
DO YOU WANT IT TO BE  1) ON LINE, OR  2) DOWN?
   (TYPE #)
```

USER RESPONSE: 1 OR 2

If the memory is required, check to see that the memory banks in question are properly selected and addressed, then type 1 after any adjustments. Memory is rescanned to check for the required amount.

If the memory is not required, type 2. The memory is then classified as down or unavailable, and is not used. Note that on KA10-based systems (1040, 1050, and 1055), all available memory should be contiguous (all memories classified as down are at the top of core) for maximum system performance, e.g., non-contiguous memory limits the maximum job size and compromises the swapping algorithm. Nevertheless, it is possible to run on a KA10 with non-contiguous memory.

Note that after a system power failure, the memories that you want on-line may not be in a ready condition. If the AW (await request) light is not ON, open the front door of the appropriate memory cabinet and push the RESET switch several times. If the AW light does not go on, go to the rear of the cabinet and power the memory OFF and then ON. If the light still does not go on, type 1 anyway (because the indicator bulb may be burnt out).

If the monitor repeats the message for the same memory, deselect all ports on that memory and, if contiguous memory is desired, switch the highest memory down into the deselect memory. Be sure to check all ports and check for interleaving.

If the highest memory is interleaved, you must change the interleaving of the memories adjacent to the highest memory.

6. ONCE asks for the desired STARTUP Option

```
STARTUP OPTION:
```

You type one of the following, depending upon your needs. (Refer to Sections 16.2 through 16.8 for a more detailed explanation of each option.)

QUICK	To start the system quickly without changing any parameters. (Refer to Section 16.2.)
GO	To check to see if everything is in order and to start the system with a minimum of dialogue. (Refer to Section 16.3.)
DESTROY	To automatically restructure and refresh all disks according to a predetermined set of standards. (Refer to Section 16.4.)
REFRESH	To explicitly refresh selected file structures without changing other system parameters. (Refer to Section 16.5.)
UNITID	To change selected unit IDs without changing other system parameters. (Refer to Section 16.6.)
CHANGE	To explicitly set or change selected file structure parameters. (Refer to Section 16.7.)
LONG	To explicitly set all parameters and restructure the file system in a non-standard way. (Refer to Section 16.8.)
NOINITIA	To start the system quickly without setting any new parameters and without running INITIA (refer to Section 16.2).

USER RESPONSE: LONG

7. ONCE lists the number of monitor buffers and accepts a change.

```
# MONITOR BUFFERS = 6
```

USER RESPONSE: <CR> to leave at that number

Type n (decimal) to change the number of buffers

The value you type is not written back onto the disk; therefore, it lasts only for this load of the monitor. Note that the value you type must be 2 or greater.

This parameter can be changed permanently by

a. Redefining symbol MBFN during the MONGEN dialogue or

b. Patching the location MBFNUM with EXEC DDT or with FILDDT and resaving it.

8. ONCE reads both HOME blocks from each unit in system.

   The ONCE-Only dialogue reads the HOME blocks from all disk units that the Monitor was generated to handle. If a unit is write protected, the ONCE-Only dialogue types:

```
%DPA2 IS WRITE PROTECTED

DO YOU WANT IT TO BE 1) WRITE-ENABLED, OR
   2) WRITE-PROTECTED? (TYPE #)
```

   USER RESPONSE: 1

   Set the unit properly. If you do not wish to initialize the HOME blocks, turn the unit off line. After the HOME blocks have been initialized the first time, the monitor can be started with the unit write protected.

9. ONCE lists HOME block consistency errors and asks to initialize. If a disk unit has not been refreshed previously (true for the first time Monitor startup) or has been written on by a test or maintenance program, the ONCE-Only dialogue types:

```
?FHA0 FIRST HOME BLOCK CONSISTENCY ERROR

?FHA0 SECOND HOME BLOCK CONSISTENCY ERROR

DO YOU WANT TO INITIALIZE THE HOME BLOCKS
   ON THIS UNIT?
```

   USER RESPONSE: Y

   If only one of the two HOME blocks has a consistency errors, you type N<CR> and the data in the good HOME block will be used. If both HOME blocks have consistency errors, you must dissolve the file structure, redefine, and refresh. You type Y<CR> to this question and continue with the LONG dialogue.

   If there are any off-line controllers, the ONCE-Only dialogue might type:

```
%CONTROLLER FHA IS OFF-LINE

DO YOU WANT IT TO BE 1) ON-LINE, OR
   2) DOWN?  (TYPE #)
```

   USER RESPONSE: 1 or 2

   You must change the controller if it was not set properly. If you type anything other than 2, the monitor tries the controller again. If you specify that the controller is down, the monitor does not attempt to use any of the units on the controller.

If there are any on-line controllers, ONCE may type:

```
%CONTROLLER DPAn WRITE-HEADER LOCKOUT SWITCH
   ALLOWS WRITING HEADERS.

DO YOU WANT IT TO BE 1) SET OR
   2) IGNORED  (TYPE #)
```

USER RESPONSE: 1

If the write-header lockout switch is OFF, it allows formatting of disk packs under timesharing. If it is OFF, turn the switch to ON and type 1. This switch must be ON to start the monitor.

If you type 2 (ignored), ONCE types

```
NOT NORMALLY DONE, ARE YOU SURE?
```

as a warning. You type YES if you are sure, and NO if you wish to reanswer the previous question.

If there are any off-line units on the controller, the ONCE-Only dialogue might type:

```
%FHA1 IS OFF-LINE

DO YOU WANT IT TO BE 1) ON-LINE,
   2) OFF-LINE, OR 3) DOWN?  (TYPE #)
```

USER RESPONSE: 1, 2, or 3.

You must change the unit if it has not been set properly. If you type anything other than 2 or 3, the monitor tries the unit again. If you specify that the unit is down, the monitor cannot access it again, unless you issue the ATTACH command to put the unit off-line. The MOUNT command can be used to place the unit in the monitor's pool of available devices. You can also issue the DETACH command to declare a unit as down, which removes the unit from the monitor's pool of available devices. You can cause a disk pack unit to be off-line without powering it down. Simply set the enable/disable switch to disable the unit. If the monitor is built to handle more units than are physically attached, no harm is done. There is only the minor annoyance of answering this question with 3 every time the Monitor is started (LONG dialogue). Software unit data blocks (UDBs) can be easily patched out of the system with EXEC DDT or FILDDT to avoid the above questions because the unit data blocks (e.g. RPA3CB) are linked through the LH of relative location UNISYS. (Refer to PATMON.)

On subsequent startups, one of the following error messages may occur:

```
?MORE THAN ONE LAST UNIT IN ACTIVE SWAPPING LIST

?MORE THAN ONE LAST UNIT IN STR XXXX

?NO UNITS IN ACTIVE SWAPPING LIST
```

%LAST UNIT IN ACTIVE SWAPPING LIST NOT FOUND

?CHANGE THE SLAVE OFFSET SWITCH IN BAY 2

?TWO LOGICAL UNIT N'S FOUND IN ACTIVE SWAPPING LIST

%LOGICAL UNIT N MISSING FROM ACTIVE SWAPPING LIST

?LAST UNIT WASN'T FOUND IN STR XXXX

?TWO LOGICAL UNIT N'S FOUND IN STR XXXX

?LOGICAL UNIT N MISSING FROM STR XXXX

?TWO LOGICAL STR N'S FOUND IN "SYS" SEARCH LIST

%LOGICAL STR # N MISSING FROM SYS SEARCH LIST

?NO STR'S IN SYS SEARCH LIST

You must change parameters and/or mount or dismount packs to get rid of the error condition. It is not an error to have units that are not in any file structure. So the message

UNITS NOT IN A FILE STRUCTURE:

does not need corrective action. In fact, the swapping unit in a large system may be entirely dedicated to swapping. In this case, it is recommended that the swapping unit not be included in a file structure because the space for the skeleton file structure can be saved. Note, however, that the first 12 decimal blocks must still be used for HOME and BAT blocks.

10. ONCE lists BAT block consistency errors:

?DPA0 FIRST BAT BLOCK CONSISTENCY ERROR

?DPA0 SECOND BAT BLOCK CONSISTENCY ERROR

DO YOU WANT TO INITIALIZE THE BAT BLOCKS ON
THIS UNIT?

USER RESPONSE: N

(Type Y if the BAT block has not been written on by the mapping option of a maintenance program.)

If only one BAT block has consistency errors, you type N because the other BAT block is probably all right. If both BAT blocks have consistency errors, you type Y. ONCE responds with

NOT NORMALLY DONE, ARE YOU SURE?

USER RESPONSE: Y

ONCE responds with INITIALIZING BAT BLOCKS.

ONCE asks for unit names on which to list the number of bad regions from the BAT blocks.

TYPE PHYSICAL UNIT NAME TO LIST BAD REGIONS

(<CR> IF NONE, ALL IF ALL)

USER RESPONSE: <CR>

Usually there are none, but if you specify a physical name or ALL, then ONCE types

DPA2 (2RP005)

BAD REGIONS=xxxxx

#BAD BLOCKS=XXXXX

11. ONCE lists STRs and units for disk packs in them.

The ONCE-Only dialogue types out each file structure name followed by the physical unit name of each unit in the file structure in its logical order. The unit ID is typed in parentheses after each physical unit name. Example:

DSK FILE STRUCTURES (STRS):

DSKA:FHA0(RM10A),FHA1(RD10A)

DSKB:DPA1(DP0KZQ),DPA0(DP2KMR),DPA2(DP1RWP)

If there are no file structures, only the header line is typed, because you must take action.

12. ONCE lists units not in an STR, if any.

The ONCE-Only dialogue types out each physical unit not in a file structure followed by the unit ID. This list always includes the off-line and down units. Parentheses mean the unit name is zero. Example:

UNITS NOT IN A FILE STRUCTURE:

FHA2(),DPA3(DP35WN)

If there are no units in the file structures, the heading is not typed.

13. ONCE lists units in the active swapping list.

The ONCE-Only dialogue types out all physical units in the active swapping list, along with the swapping class of each unit. Class0, class1 ... classn describe different varieties of swapping space. Lower number swapping spaces should contain high-speed devices because all lower class space is used first.

UNITS IN ACTIVE SWAPPING LIST:

FHA(0),DPA1(1)

If there are no units in the active swapping list, the ONCE-Only dialogue types:

?NO UNITS IN ACTIVE SWAPPING LIST

This typeout is to be expected on the first monitor startup. This situation must be corrected by including at least one unit in the active swapping list.

14. ONCE lists STRs in the system search list.

    The ONCE-Only dialogue types out all file structure names in the system search list for device SYS. SYS should include a fast and a slow file structure. Most .EXE files should be put on the slower file structure, because the dormant segments are kept on the faster swapping units. Other active files such as accounting files should also be considered as candidates for a faster file structure within SYS.

    Example:

        STR's IN "SYS SEARCH LIST:

        DSKA,DSKB

    (There will be none the first time.)

15. ONCE asks for an STR name to list its parameters.

        TYPE STR NAME FOR A LIST OF ITS PARAMETERS (CR IF NONE, ALL IF ALL)

    USER RESPONSE: <CR>

16. ONCE asks for a unit name to list its parameters.

        TYPE PHYSICAL UNIT NAME TO LIST ITS PARAMETERS (CR IF NONE, ALL IF ALL)

    USER RESPONSE: <CR>

17. ONCE asks if you want to change anything.

        BEFORE "HOME" BLOCKS ARE REWRITTEN,
        DO YOU WANT TO CHANGE ANY DISK PARAMETERS?

    USER RESPONSE: Y

    (You wish to define some file structures.)

    If you type <CR>, ONCE goes to Step 25 (ask about refreshing).

18. ONCE asks if you want to dissolve any STRs.

        TYPE STR NAME TO BE DISSOLVED (CR IF NONE, ALL IF ALL)

    USER RESPONSE: <CR>

    (There are none to dissolve.) If you want to redefine a file structure on a subsequent startup, you must first dissolve all STRs that have the units you wish to include in the new STR. If there are no file structures, which is the case the first time ONCE-Only is run, this question is omitted.

19. ONCE asks for a STR to be defined.

        TYPE STR NAME TO BE DEFINED (CR IF NONE)

USER RESPONSE: DSKA

(Define the fastest file structure first.)

ONCE asks for the names of units to be in the file structure.

TYPE NAMES OF PHYSICAL UNITS IN STR (ALL IF ALL, EXTRA CR WHEN DONE)

USER RESPONSE: FHA0 <CR>
FHA1 <CR>
<CR>

If you type a name that is not a physical unit name, this incorrect name is ignored and you receive the message

?NOT A PHYSICAL UNIT - TRY AGAIN

If you have two units (RM10B or RD10 or a mixture) on the RC10, follow with an extra carriage return to indicate the end of file structure DSKA. If there are a small number of units of a particular type, say two or three, define them to be in one file structure. If your installation has a large number of units you can define more than one file structure for that controller type. Remember that it is possible to put RM10B and RD10 in the same file structure. You may wish to leave an RM10B out of any file structure and use it solely for swapping, thereby eliminating most STR overhead.

If there are any physical units not yet defined to be in a structure, ONCE asks for another STR to be defined. If not, then ONCE goes directly to question 20.

TYPE STR NAME TO BE DEFINED (CR IF NONE)

USER RESPONSE: DSKB

(Type in the second fastest file structure name.)

ONCE asks for units to be in this file structure.

TYPE NAMES OF PHYSICAL UNIT IN STR (ALL IF ALL, CR WHEN DONE)

USER RESPONSE: DPA0 <CR>
DPA1 <CR>
DPA2 <CR>
<CR>

If you have, for example, three units on the RP10.

ONCE asks for another STR to be defined.

TYPE STR NAME TO BE DEFINED (CR IF NONE)

USER RESPONSE: <CR>

If all desired units have been defined to be part of some file structure.

20. ONCE asks if you want to change any STR parameters.

TYPE STR NAME TO CHANGE ITS PARAMETERS (CR IF NONE, ALL IF ALL)

USER RESPONSE: DSKA

(Because you have not defined any parameters yet, you could type ALL to define all.)

AFTER EACH PRINTING OF CURRENT VALUE, TYPE NEW VALUE OR CR

PARAMETERS WHICH MAY BE CHANGED WITHOUT REFRESHING

# OF CONSECUTIVE BLOCKS TRIED FOR ON OUTPUT=n
MIN=1 MAX=m

where n is 10 for RC10 file structures or
30 for RP10 file structures
and m is the size of the STR.

USER RESPONSE: <CR>

SUM OF BLOCKS GUARANTEED TO USERS=0
MIN=0 MAX=m

where m is the number of blocks on the STR. Because reserve quotas are not implemented for the 603 release, this number is not used.

USER RESPONSE: <CR>

# BLOCKS ALLOWED FOR OVERDRAW PER USER=n
MIN=0 MAX=m

where n is 200 for RC10 file structures
500 for RP10 file structures
and m is max. number of blocks in STR.

USER RESPONSE: <CR>

The overdraw amount should be as large as a source file so that editing with TECO can be completed while exceeding a user's quota, but before the overdraw amount runs out.

PARAMETERS WHICH MAY NOT BE CHANGED WITHOUT REFRESHING
K FOR CRASH.EXE=n
MIN=0 MAX=4096

n is determined by the larger of the MONGEN-specified size or the actual size of the machine.

USER RESPONSE: n or <CR>

Where n is the core size of the machine on which the monitor is running. (CRASH.EXE is used by BOOTS to dump a core image when the monitor crashes.)

BLOCKS PER CLUSTER=n
MIN=1 MAX=511

where n = 1 for RC10 file structures
5 for RP10 file structures. (10 is also supported for RP10, RHx0, and RP0x file structures.)

USER RESPONSE: <CR>

THEREFORE BITS PER CLUSTER ADR.=13
THEREFORE BLOCKS PER SUPER CLUSTER=m
THEREFORE SUPERCLUSTERS PER UNIT=n

For RP02, m=5 n=8000
For RM10B, m=1, n=2700
For RD10, m=1, n=4000
For RP03, m=5, n=16000
For RP04, m=10, n=15428
For RP06, m=10, n=30780

BITS PER CLUSTER COUNT=9
MIN=1 MAX=18

USER RESPONSE: <CR>

This gives up to 511 clusters in one retrieval pointer.

THEREFORE BITS PER CHECKSUM=14

21. ONCE asks if you want to change any other STR parameters.

TYPE STR NAME TO CHANGE ITS PARAMETERS (CR IF NONE, ALL IF ALL)

USER RESPONSE: Next STR name to be changed (e.g., DSKB)
or
<CR> if none

Repeat question 21. for each STR.

22. ONCE asks if you want to change any unit parameters.

TYPE PHYSICAL UNIT NAME TO CHANGE ITS PARAMETERS (CR IF NONE, ALL IF ALL)

USER RESPONSE: ALL

[The first time.] The ONCE-Only dialogue types out one physical unit name. It repeats the questions for each unit.

AFTER EACH PRINTING OF CURRENT VALUE, TYPE NEW VALUE OR CR

(Then the monitor types out the first physical device name.)

PARAMETERS WHICH MAY NOT BE CHANGED WITHOUT REFRESHING

ZERO UNIT ID-NEW ID NEEDED

USER RESPONSE: RD001

The unit ID may be up to six characters in length. It is suggested that a unit ID indicate the type of unit. For example,

RD000, RD001, RD002, RD003, (FOR RD10s)
RM000, RM001, RM002, RM003 (FOR RM10Bs)
2RP000, 2RP001, 2RP002, 2RP003, 2RP004, 2RP005,
2RP006 (FOR RP02s)

Each pack at an installation should have a unique ID.

K FOR SWAPPING ON UNIT=0
MIN=0 MAX=p

For RP02 p=4095. For RM10B or RD10 p=337. For RP03 p=8191.

USER RESPONSE: N

Where n is about 15 times the number of jobs the system is built for if this is the first drum unit or 0 times for all other units.

You may wish to allocate some space for swapping on another unit in case the first unit goes down. A unit will not be used for swapping unless it is in the active swapping list.

If n is greater than maximum, the message (for RP02).

?CANNOT EXCEED 4095

The maximum (p) may be too large. If the unit is in a file structure, it is suggested that p-2 be the largest number specified.

NOTE

There is no requirement that a unit used for swapping be part of a file structure. By not making it part of a file structure, the space for the skeleton file structure can be saved. Note that the HOME and BAT blocks must still be present (Blocks 1, 2 and 10, 11 decimal).

COMPUTED 1ST LOGICAL BLOCK FOR SWAPPING=YYYYY
1ST LOGICAL BLOCK FOR SWAPPING=YYYYY
MIN=13 MAX=YYYY

USER RESPONSE: <CR>

The ONCE-Only program has computed the best place for the swapping space by putting it in the middle of the unit. If there are any bad spots in that region, you should move the swapping space down by typing a smaller logical block number. The question is skipped if no swapping space was allocated.

If YYYYY is too low, so that it would interfere with the HOME and BAT blocks, the ONCE-Only dialogue will type:

```
MUST EXCEED 11
```

If YYYYY is too high, so that it would run past end, the ONCE-only dialogue will type:

```
CANNOT EXCEED YYYYY
```

```
# SAT BLOCKS ON UNIT=t
MIN=t   MAX=223
```

Where t is the minimum.

For RP02, t=2. For RM10B or RD10, t=1. For RP03, t=4. For RP04, t=4. For RP06, t=7.

USER RESPONSE: <CR>

Then the ONCE-Only dialogue types

```
THEREFORE CLUSTERS PER SAT=xxxx

THEREFORE WORDS PER SAT=yyy
```

If the cluster size is smaller than the recommended size, more than one SAT block per unit will be required. If you type a number that is too small, the dialogue responds with

```
TOO SMALL - MIN =N
```

and repeats the question.

```
PARAMETERS WHICH MAY BE CHANGED WITHOUT
REFRESHING

# SAT BLOCKS IN CORE=M
MIN=1  MAX=m
```

USER RESPONSE: m

The suggested words per SAT block have been chosen so that each unit has only one or two SAT blocks. It is faster to have all SAT blocks in memory. If the number of SAT blocks on this unit is 1, this question is skipped. If ALL had been typed or another unit is to be changed, ONCE goes back to beginning of question 18.

23. ONCE lists units in the active swapping list and asks if you want to make any changes.

```
UNITS IN ACTIVE SWAPPING LIST:
FHA0 (0), DPA0 (1)

DO YOU WANT TO CHANGE THE ACTIVE SWAPPING
 LIST?
```

USER RESPONSE: Y

(You must define an active swapping list if this is initial system startup.)

```
FOR EACH CLASS TYPE PHYSICAL UNIT NAMES (CR
 WHEN DONE)

CLASS 0
```

USER RESPONSE: FHA0

If there are more units in Class 0, type FHA1. Type an extra carriage return when finished with Class 0.

CLASS 1

USER RESPONSE: DPA0 if swapping space is allocated,
or
<CR>

NOTE

1. Class 0, class 1,....class n describe the different varieties of swapping space. Lower numbered swapping space should contain higher speed devices because all lower class space is used first.

NOTE

2. The small monitor (DECsystem-1040) allows only one file structure and one unit for swapping. After the question

```
UNITS IN ACTIVE SWAPPING LIST:
        CLASS 0
        DPA0
```

ONCE-Only types

```
%SWAPPING LIST FULL
```

With the small monitor this message is expected and should not alarm you.

24. ONCE lists STRs in the system search list and asks if you have any changes.

```
STRS IN "SYS" SEARCH LIST
DSKA,DSKB
DO YOU WANT TO CHANGE THE "SYS" SEARCH LIST?
```

USER RESPONSE: Y

(You must define a system search list if this is the initial system startup.)

```
TYPE STR NAMES FOR "SYS" SEARCH LIST (EXTRA CR WHEN
DONE)

USER RESPONSE:  DSKA
                DSKB
                <CR>
```

The fastest file structure name (e.g., DSKA) followed by a slower one and an extra carriage return.

25. ONCE asks to list STR parameters.

```
BEFORE "HOME" BLOCKS ARE WRITTEN
TYPE STR NAME FOR A LIST OF ITS PARAMETERS (CR IF NONE,
ALL IF ALL)

USER RESPONSE:  <CR>
```

You will be able to check after HOME blocks are written. To check now type structure names or ALL.

26. ONCE asks to list unit parameters.

```
TYPE PHYSICAL UNIT NAME FOR A LIST OF ITS
 PARAMETERS (CR IF NONE, ALL IF ALL)

USER RESPONSE:  <CR>
```

You are able to check later.

27. ONCE asks if you want to change anything.

```
DO YOU WANT TO CHANGE ANY DISK PARAMETERS?
 (CR IF NO)

USER RESPONSE:  <CR>
```

28. Asks for the HOME blocks to be written.

```
TYPE PHYSICAL UNIT TO WRITE HOME BLOCKS (CR IF NONE,
ALL IF ALL; "ALL" IS NORMAL CASE)

USER RESPONSE:  ALL
```

Under normal circumstances ALL is the only acceptable answer to this question. <CR> can be used during software development if you are experimenting and do not want to change the HOME blocks permanently. (Any other answer can cause problems.)

ONCE types

```
HOME BLOCKS WRITTEN
```

If an error condition exists, ONCE types a message and goes back to question 8. If there is no error, ONCE lists the structures defined by the HOME blocks and indicates those that need refreshing. ONCE then lists the units that are not in a file structure, the units that are in the swapping list above, and the STRs in the "SYS" search list. ONCE then lists the parameters for STRs and physical units if you request.

29. ONCE asks for the STR name to be refreshed.

```
DO YOU WANT TO CHANGE ANY DISK PARAMETERS
```

If ONCE determines that one or more structures needs refreshing, it will type the message:

```
%NEED REFRESHING:
aaa
```

where aaa are the STRs that need refreshing.

```
TYPE STR NAME TO BE REFRESHED (CR IF NONE,
ALL IF ALL)
```

USER RESPONSE: ALL

(The first time you wish to refresh everything.)

30. ONCE asks you to LOGIN.

```
TO AUTOMATICALLY LOGIN UNDER [1,2] TYPE LOGIN
```

USER RESPONSE: LOGIN

31. The Monitor starts running the null job and initiates timesharing.

32. If the LOG option is run, post the output from questions 10 through 27 on the wall as the latest disk configuration.

33. When building a new monitor return to Chapter 5 for instructions on restoring files to the disk.

16.9 WHY RELOAD QUESTION

As a part of the loading procedure the ONCE-Only dialogue asks for the reason for the reload. The question

```
WHY RELOAD:
```

is typed on your terminal, just before the questions asking for the date and time. You must specify your reason for reloading the monitor by typing one of the answers described in this section, or an abbreviation that uniquely describes it. If more than one answer applies, you type the one that appears first in the list. If you wish to include information related to your answer, e.g., circumstances surrounding a system crash, you may do so by including the text on the same line as the answer. The entire string of text is first stored in the crash AC area and then copied to the log file by DAEMON.

The possible answers to the WHY RELOAD: question fall into four categories:

```
System problem
Stand-alone time
New or different monitor
Other
```

1. System Problem

   If you are reloading the monitor as a result of a system problem or crash, you identify the cause of the problem with one of the following answers.

Answer	Meaning
OPR	Operator error
PARITY	Memory parity stop or halt
POWER	Power failure on some device
STATIC	Static electricity
HARDWARE	Hardware malfunction
NXM	Non-existent memory stop
HALT	STOPCD or halt
LOOP	Monitor loop in executive mode
HUNG	No response

2. System Stand-Alone

   If you are reloading the monitor to get timesharing services back on the air, you type one of the following answers.

Answer	Meaning
PM	Preventive maintenance. Stand-alone that was required for regularly scheduled maintenance procedures.
CM	Corrective maintenance. Stand-alone that was required for unscheduled maintenance procedures.
SA	Other stand-alone projects, such as programmer debugging session or reformatting of disk packs.

3. New or Different Monitor

   If you are loading a new or a different monitor, you choose one of the following answers.

Answer	Meaning
NEW	New monitor, e.g., monitor with an added feature or improvement via a patch.
SCHED	A scheduled change from one monitor to another, e.g., a change from a dual system monitor to a single system monitor and back.

4. Other

If none of the above reasons applies, you type OTHER.

16.10 ERROR MESSAGES

The following error messages may be typed on your terminal during the ONCE-Only dialogue.

%ACTIVE SWAPPING LIST FULL

An attempt was made to specify more units to the active swapping list than the monitor tables can handle. The current limit is 8. If you need more swapping space, you should increase the amounts on the eight units already specified.

?CANNOT EXCEED # BLOCKS IN FILE STRUCTURE = n

The number of disks blocks specified for reserved quotas or the number of disk blocks specified for the overdraw amount was too large. You should type in a number less than or equal to n.

?CANNOT EXCEED # SAT BLOCKS ON UNIT = n

The number of SAT blocks in memory cannot exceed the number of SAT blocks (n) on the unit. You should type a number less than or equal to n.

%CONTROLLER DPA HAS WRITE HEADER LOCKOUT SWITCH OFF
DO YOU WANT IT TO BE 1) ON-LINE, 2) OFF-LINE, OR
3) DOWN? TYPE#

?CPU0 FAST AC'S ARE OFF (FM ENB)

In a multiprocessing system, the monitor halts after this message because it is not possible for a multiprocessing system to run without the fast ACs (split memory cycle is enabled). You must enable the fast ACs by performing the following steps:

1. Push STOP.

2. Turn FM ENB off.

3. Set ADDRESS switches to 400.

4. Push START.

On a single processor system, the above is an advisory message. The system runs considerably slower without the fast ACs, so you should enable them as indicated in steps 1-4 above.

%DPA IS OFF-LINE
DO YOU WANT IT TO BE 1) ON-LINE OR 2) DOWN? (TYPE#)

Controller DPA (RP10) is off line. You should check the settings of all switches in RP10 bay. All switches should be down. After changing the switches, you should type 1. If you do not want the monitor to use the controller, you should type 2. This also applies to DPB.

%DPA0 IS OFF-LINE
DO YOU WANT IT TO BE 1) ON-LINE, 2) OFF-LINE, OR
3) DOWN? (TYPE#)

You should check the START/STOP rocker switch and the ENABLE/DISABLE switch on the individual disk pack unit. They should be in the normal position with the top of the switch in. After changing switches, you should type 1. If you do not want the monitor to use the unit, you should type 2. This message also applies with DPA1,DPA2,...,DPA7,DPB0,DPB1,...,DPB7.

%DPA0 IS WRITE PROTECTED. DO YOU WANT IT TO BE
1) WRITE-ENABLED, OR 2) WRITE-PROTECTED?

Disk pack unit DPA0 is on line, but is write protected. If you wish it to remain this way, you should type 2. Otherwise, you should set the READWRITE/READ ONLY rocker switch to normal (top of switch in) and then type 1. This message also applies with DPA1,...,DPA7,DPB0,DPB1,...,DPB7.

?ERROR ON CPU1
?CHANGE THE CPU1 MA TRP OFFSET SWITCH IN BAY1

In a multiprocessing system, the monitor halts after this message is printed at CTY (CPU0). At the CPU1 console, behind the door of bay 1, change the setting of the MA TRP OFFSET switch. Then push CONT on CPU1. (CPU0 is not affected by this error and continues timesharing.)

?ERROR ON CPU1
?FAST AC'S TURNED OFF - SET FM ENB

In a multiprocessing system, CPU1 halts after this message is typed at CTY (CPU0). At CPU1 console set FM ENB by rocking the FM ENB switch (on the maintenance panel behind the door). Then push CONT at CPU1. (CPU0 is not affected by this error and continues timesharing.)

%FHA IS OFF-LINE
DO YOU WANT IT TO BE 1) ON-LINE OR 2) DOWN? (TYPE #)

Controller FHA (RC-10) is off line. You should check settings of all switches in RC-10 bay. All switches should

be down. After changing switches, you should type 1. If you do not want the monitor to use the controller, you should type 2. Also applies to FHB.

%FHA0 IS OFF-LINE
DO YOU WANT IT TO BE 1) ON-LINE, 2) OFF-LINE, OR
3) DOWN? (TYPE #)

You should check the unit dial selectors. One of them (DISK A, DISK B, DISK C, or DISK D) should be set to 0. You should set the switches for all the units you have to 0, 1, 2, or 3. The other units should be OFF. You should not touch any dials that are dialed to numbers numerically less than the one just typed out, because the monitor has already read these units. After changing the switches and dials, you should type 1. If the unit is temporarily down and will be fixed while the system runs, you should type 2. In all other cases, you should type 3. This could apply to FHA1,...,FHA3,FHB0,...,FHB3.

FIRST BAT BLOCK CONSISTENCY ERROR

The ONCE-Only dialogue has discovered that the first of two redundant BAT blocks does not contain some of the data normally expected in a BAT block. This is not a fatal error because the other BAT block is probably all right. If both BAT blocks have this error, you should initialize the BAT blocks. This error may occur if some of the diagnostics are run.

FIRST BAT BLOCK HARDWARE ERROR

The ONCE-Only dialogue has had a hardware error while reading the first of two redundant BAT blocks. Because there is another BAT block, this error is usually not fatal. The controller status is put in the console lights.

FIRST HOM BLOCK CONSISTENCY ERROR

The ONCE-Only dialogue has discovered that the first of two redundant HOME blocks does not contain some of the data normally expected in a HOME block. Therefore, none of the data should be considered valid. This is not a serious error since the other HOME block is usually all right. If both HOME blocks have consistency errors, you have to dissolve the file structure, redefine it, and refresh it.

FIRST HOM BLOCK HARDWARE ERROR

The ONCE-Only dialogue has had a hardware error while reading or writing the first of two redundant HOME blocks. This is not fatal because there is another HOME block. The controller status is put in the console lights, and the

controller is left in its error condition.

?LAST UNIT WASNT FOUND IN STR DSKn

The last unit in file structure is missing. You should check to see that all the proper packs are mounted and on-line. If not, you should remount them and restart the monitor at 140. Otherwise, you have to dissolve the file structure, redefine it, and then refresh it, thereby destroying any data already on the unit.

%LOGICAL STR # n MISSING FROM THE "SYS" SEARCH LIST

A file structure is missing from the SYS search list. This condition need not be corrected, because the monitor will skip the missing file structure. To avoid the message in the future, you should change the system search list when asked.

%LOGICAL UNIT n MISSING FROM ACTIVE SWAPPING LIST

A unit is missing from the active swapping list. This can happen if a unit is off line or down. This error need not be corrected since the monitor will order the swapping list accordingly.

?LOGICAL UNIT n MISSING FROM STR DSKn

A unit is missing from a file structure and must be remedied. You should check that all proper packs are mounted and on line. If this is not so, you should add the proper packs and restart the monitor at 140. Otherwise, you have to dissolve the file structure, redefine it, and refresh it, thereby destroying any data already on the unit.

%MEMORY FROM xxxxx TO yyyyy IS OFFLINE
DO YOU WANT IT TO BE 1) ONLINE OR 2) DOWN? (TYPE #)

If the specified memory is supposed to be off line, type 2. Otherwise, push the reset button at the rear of the memories. Check to see that the memory is selected and all required ports are ON. After all switches are in order, return to the CTY and type 1. If the error message is repeated, attempt to switch this memory out of the system and switch the top memory into its place.

?MORE THAN ONE LAST UNIT IN ACTIVE SWAPPING LIST

The active swapping list specified in the disk unit HOME blocks has more than one unit as the last one. You should redefine the units in the active swapping list to correct

this situation.

?MORE THAN ONE LAST UNIT IN STR DSKn

The file structure has more than one unit specified as the last unit as recorded in the disk HOME blocks. You should dissolve the file structure and redefine it.

?NO UNITS IN ACTIVE SWAPPING LIST

None of the on-line units is in the active swapping list. Because there must be swapping space, you must change the active swapping list to include a unit that has some swapping space. If there are no units with swapping space, you must define swapping space on a unit not in a file structure. If all units are in file structures, you must refresh a file structure, define the necessary swapping space, and redefine the active swapping list.

NOT NORMALLY DONE, ARE YOU SURE?

This warning message is printed when you respond to certain important questions in an unexpected or non-standard manner. It allows you to verify your choice of answer or recover from a typographical error before serious damage is done.

%PROBLEM ON CPU1

CPU1 has halted. Restart it by setting data switches to 400 and pushing STOP, RESET, START. Note that the above message is printed once a minute until CPU1 is started. You can use the OPSER command :SET CPU to stop scheduling CPU1 and, consequently, stop the message.

SAT BLOCK HARDWARE ERROR

The ONCE-Only dialogue has had a hardware error while reading one of the SAT blocks.

SECOND BAT BLOCK CONSISTENCY ERROR

The ONCE-Only dialogue has discovered that the second of two redundant BAT blocks does not contain some of the data normally expected in a BAT block. This is not a fatal error because the other BAT block is probably all right. If both BAT blocks have this error, you should initialize the BAT blocks. This error may occur if some of the diagnostics are run.

SECOND HOM BLOCK CONSISTENCY ERROR

The ONCE-Only dialogue has discovered that the second of two redundant HOME blocks does not contain some of the data normally expected in a HOME block. Therefore, none of the data should be considered valid. This is not a serious error since the other HOME block is usually all right. If both HOME blocks have consistency errors, you have to dissolve the file structures, redefine and refresh.

SECOND HOM BLOCK HARDWARE ERROR

The ONCE-Only dialogue has had a hardware error while reading or writing the second of two redundant HOME blocks. This is not fatal since there is another HOME block. The controller status is put in the console lights, and the controller is left in its error condition.

?THIS MONITOR WAS BUILT FOR A xxxxx AND
WILL NOT RUN PROPERLY ON A yyyyy.

xxxxx and yyyyy can be PDP-6, KA10, KI10, or KL10. You have loaded the wrong monitor. You must try another. If, after several tries, the monitor appears to be the correct one, then you must rerun MONGEN and change the answer to the question asking for the type of processor. Refer to Chapter 9, question 3 in Section 9.4.

?TOO SMALL - MIN. #=X

An answer to the ONCE-Only dialogue or a default value is too small. Type in an answer greater than or equal to X.

?TWO LOGICAL UNIT n's FOUND IN ACTIVE SWAPPING LIST

The active swapping list has more than one unit in the same position. You must redefine the active swapping list.

?TWO LOGICAL UNIT n's FOUND IN STR DSKn

Two units are marked to be in the same logical position in the file structure. This happens only if two different file structures have been given the same name. You should try to remove the pack that does not belong in the file structure and then restart the monitor at 140. Otherwise, you have to dissolve DSKn, redefine it and refresh it.

?TWO LOGICAL STR n's FOUND IN "SYS" SEARCH LIST

Two file structures are marked to be in the same position in the SYS search list. You should change the SYS search list when asked. Refreshing is not required.

unit
BAD REGIONS=n
BAD BLOCKS=n
DO YOU WANT TO INITIALIZE THE BAD BLOCKS ON THIS UNIT?

You should answer with N or a carriage return to leave the BAT blocks alone on this unit. The only time you should initialize is the first time the disk is written, since the blocks contain the accumulated information about bad sectors. If you answer Y, the ONCE-Only dialogue responds with NOT NORMALLY DONE, ARE YOU SURE?. Answer Y only if this important data is to be erased.

?UNIT ALREADY IN ACTIVE SWAPPING LIST

An attempt was made to specify a unit to be in the active swapping list more than once. You should type a different unit name to be in the active swapping list. If you have included the unit name earlier by mistake, you will have another chance to change the active swapping list.

?UNIT ALREADY IN FILE STRUCTURE

An attempt was made to specify a unit to be in more than one file structure. You should type a different unit name to be in this file structure. If you have included the unit in an earlier file structure by mistake, you will have to dissolve it.

?UNIT HAS NO SPACE ALLOCATED FOR SWAPPING

An attempt has been made to specify a unit that has no swapping space allocated to be part of the active swapping list. The unit is not added to the list. You should do one of the following:

1. Specify another unit.

2. Type an extra carriage return signifying completion.

3. Define swapping space for a unit not in a file structure.

4. Change the swapping space for a unit in a file structure and refresh it.

CHAPTER 17

BACKUP

17.1 INTRODUCTION

BACKUP is a system program that is used to save disk files on magnetic tape, and later to restore any or all of these files to disk. Magnetic tape is the medium used for backup storage of disk files and for transporting files between sites. This chapter outlines some of the features that BACKUP provides for accomplishing these two tasks.

17.2 FEATURES

BACKUP allows you flexibility in choosing the files to be transferred between disk and tape. You specify files by the standard file specification format of dev:filename.ext[project,programmmer]. Wildcards and sub-file directories are fully supported. You may also select files based on any of the dates/times associated with disk files.

BACKUP can handle files that are longer than one reel of magtape. Switches are provided for checkpointing files while the files are being handled.

If you are backing up the disk file structure, you can recover from a system crash without starting completely over. You can produce a directory listing of the tape at the same time you perform a save. Another operator feature is a set of run-time commands compatible with the spoolers.

To facilitate transporting files between sites, BACKUP provides an "interchange" mode of operation that prevents the writing of system specific overhead information on the tape. Software distribution tapes for the DECsystem-10 are produced via BACKUP in interchange mode.

To increase reliability, BACKUP responds to hardware reported tape write errors by rewriting the data in a repeater record. When the tape is read later, these repeater records are used instead of the originals.

These and other features are described more fully in Sections 17.3 and 17.4.

17.3 OVERVIEW OF COMMAND FUNCTIONS

BACKUP commands are in the form of verbs. BACKUP prompts with a slash (/) and has three kinds of verbs:

1. Action
2. Status setting
3. Tape positioning.

Tables 17-1, 17-2 and 17-3 present BACKUP's general functions and the command verbs that perform them. Verbs are grouped into the three categories named above. Table 17-4 contains run-time commands, which may be given during execution of the action verbs.

Table 17-1
Action Verbs

Functions	Verbs
Printing directory of a tape	PRINT
Saving or restoring disk files	SAVE, RESTORE
Verifying agreement of tape and disk files	CHECK

Table 17-2
Status Setting Verbs

Functions	Verbs
BACKUP:name option (use from SWITCH.INI)	OPTION
[do not] use Checkpoints	[NO] CPOINT
Density setting (of tape)	DENSITY
[do not] Encrypt the magtape	[NO] ENCRYPT
Include files according to:	
date-time created or modified	BEFORE, SINCE
moved or modified	MBEFORE, MSINCE
date accessed	ABEFORE, ASINCE
length	LENGTH
PPN exemptions from above restrictions	[NO] EXEMPT
[do not] run in Interchange Mode	[NO] INTERCHANGE
[do not] make a Listing file while running	[N] LIST
Parity setting	PARITY
Protect directories	UPROTECTION

Restore files from tape	SUPERSEDE
Resume at a specified block of initial file	RESUME N
Save set name (specify)	SSNAME
Sort files or directories alphabetically, by location, or by directory	SORT
Start processing at specified file	INITIAL
[do not] Suppress error message prefix	MESSAGE [NO] PREFIX
[do not] Suppress first line of error message	MESSAGE [NO] FIRST
[do not] Suppress disk writing during a RESTORE	[NO] WRITE
Suppress filenames and directories	SILENCE
[do not] Type filenames or directories while running	[NO] FILES [NO] DIRECTORIES
Tape unit (use MTB0)	TAPE MTB0
[do not] run in USETI mode	[NO] USETI

Table 17-3
Tape Positioning Verbs

Functions	Verbs
Back up to start of save set	SKIP 0 tape list
Skip to end-of-tape mark for each tape	EOT
n save sets forward	SKIP n tape list
backward	SKIP -n tape list
Rewind to start of tape for each tape	REWIND
Unload each tape	UNLOAD

Table 17-4
Run-Time Commands

Functions	Commands
List and explain these commands	HELP
Abort current action verb	KILL
Continue after a STOP	GO
Display current filename and status	WHAT

Exit from BACKUP when done	EXIT
Do not exit from BACKUP when done	PAUSE
Reset status settings to defaults when done	RESET
Stop temporarily	STOP
[do not] Type all directories of files processed	[NO] DIRECTORIES [NO] FILES
Stop typing all directories or files	SILENCE

17.3.1 Action Verbs

The action verbs perform I/O and operate on the tape specified by the last TAPE verb (one of the status setting verbs). A tape must be specified before using any of the action commands, or an error will result. In the following lists of commands and switches

spec	is the standard file specification: dev:filename.ext[directories]
date	is in the form dd-mm-yy
time	is in the form hh:mm:ss

The action verbs are:

Command	Action
SAVE spec-list	Save the specified disk files on tape
RESTORE spec-list	Restore the specified tape files to disk
CHECK spec-list	Verify that the tape and disk files agree
[N]PRINT spec	Print a directory of the entire tape on spec. N is an optional prefix meaning narrow. PRINT produces the effect of a NODIRECTORIES command; i.e., no user directories will be typed.

The action commands take as an optional argument a list of file specifications in a format similar to the monitor's COPY command. The file specifications may contain wildcards and sub-file directories.

For each entry in the list, you may specify both input and output file specifications (output=input) or just the input specification. This allows the files to be renamed as they are saved or restored. If no output specification is given, then the specified files are transferred without being renamed. Entries in the list are separated by commas.

If no argument is supplied with an action command, BACKUP will default a file spec in the following way. The default file spec for all action verbs is ALL:*.*[PPN,*,*,*,*,*]. This specifies all files on all UFDs and all SFDs of all file structures with no renaming.

If you are not logged in under [1,2] the default for the SAVE verb is ALL:*.*[PPN,*,*,*,*,*]=DSK:*.*[PPN,*,*,*,*,*].

For the CHECK and RESTORE verbs the default is DSK:*.*[PPN,*,*,*,*,*]=ALL:*.*[PPN,*,*,*,*,*].

The argument for the PRINT verb is a single file spec. Its default is LPT:BACKUP.LOG.

Note that specifying any of the file spec parameters overlays only that parameter and leaves the rest of the defaults standing. Under no circumstances do the file spec parameters become "sticky" parameters; e.g., specifying the PPN for one spec does NOT carry over to the next spec in the list.

17.3.2 Status Setting Verbs

The status setting verbs set a parameter that affects future action commands. Once a status parameter is set, it remains in effect until you change it again. The format for date/time arguments is dd-mm-yy: hh:mm:ss; relative date/times (prefixed by + or -) and special mnemonic words (YESTERDAY, TODAY, TOMORROW, LOGIN, NOON, MIDNIGHT) may also be used. BACKUP conforms to the specification in the Operating System Commands manual and more details on data formats can be found there.

The complements, formed by preceding the verbs with NO, negate the commands and sometimes cause alternate actions; their effects are explained in parentheses.

The status setting verbs are:

Verb	Action
ABEFORE date	Include only files accessed before the specified date
[NO]APPEND	Append to existing list file (default) (Complement: do not supersede).
ASINCE date	Include only files accessed since the specified date
BEFORE date-time	Include only files created and last modified before the specified date-time
[NO]CPOINT	Use checkpoints. (Complement: do not use checkpoints).
[NO]DATE75	Always accept files with possible DATE75 problems (default) (Complement: do not accept these files)
[NO]DELETE	Delete disk files after saving them (Complement: do not delete)
DENSITY (200, 556, 800, 1600, 6250)	Set tape density (default is system dependent)
[NO]DIRECTORIES	Type each user's directory while running (default) (Complement: do not type directories at all)
[NO]ENCRYPT	Encrypt the magtape (asks for key

	later) (a key is similar to a password and it can consist of up to 30 alphabetic characters) (Complement: do not encrypt)
[NO]EXEMPT	Exempt PPN's of the form [A,*] and [10,B], where A and B < 7, from date/time and length restrictions (default) (Complement: do not exempt)
[NO]FILES	Type each filename while running (Complement: do not type filename at all)
INITIAL spec	Start processing at spec
[NO]INTERCHANGE	Run in interchange mode (In interchange mode, only the filenames, extensions, and versions are written. There is no information on what UFD a file was in when it was saved.) (Complement: run in normal mode, in which UFDs and device names are written)
LENGTH 1:h	Include only files whose length is between low and high
[NO]LIST spec	While running, make a listing file on spec (default spec is LPT: BACKUP.LOG) (Complement: do not make listing file) LIST produces the effect of a NODIRECTORIES command, i.e., no user directories will be typed.
MBEFORE date-time	Include only files which have been last moved or modified before the specified time
MSINCE date-time	Include only files which have been moved or modified since the specified time
MESSAGE [NO]PREFIX	Suppress error message prefix
MESSAGE [NO]FIRST	Suppress first line of error message text
[NO]MULTIREEL	Allow multiple reels during a save (default; multiple reels are always permitted on a restore) (Complement: do not allow multiple reels during a save)
OPTION NAME	Use option BACKUP:name from SWITCH.INI
PARITY (EVEN,ODD)	Set tape parity
[NO]REPEAT	Repeat a split file on the continuation tape (Complement: do

	not repeat)
RESUME n	Resume at block n of initial file
SILENCE	Do not type filenames or directories while running
SINCE date-time	Include only files created or modified since the specified date-time
SORT DIRECTORIES x	Sort directories within each file structure in order x when saving. x = ALPHABETICAL LOCATION (by compressed-file-pointer, which is related to a file's physical location on disk), or NONE (by Master File Directory)
SORT FILES x	Sort files within each directory in order x when saving. x = ALPHABETICAL, LOCATION, or NONE (by directory)
SSNAME name	Specify the save set name (up to 30 characters; ALL = all save sets on tape)
SUPERSEDE ALWAYS	Always restore file from tape
SUPERSEDE NEVER	Restore files from tape unless on disk
SUPERSEDE OLDER	Restore only the new files from tape (default)
TAPE MTB0	Use tape unit MTB0. If a magtape drive has the logical name BACKUP, then the TAPE verb need not be specified
UPROTECTION NNN	Set the protection for created directories
[NO]USETI	Run in USETI mode (speeds up SAVES with /SINCE, etc.) (Complement: do not run in USETI)
[NO]WRITE	Suppress disk writing during a RESTORE. (Complement: allow disk writing during a RESTORE)

17.3.3 Tape Positioning Verbs

BACKUP's tape positioning verbs take immediate effect. They take, as an argument, a list of tapes. If no tape is specified for a given command, the last tape declared by a TAPE verb is positioned. The tape positioning commands are:

Command	Action

EOT tape list	Skip to the end-of-tape mark for each tape in the list
REWIND tape list	Rewind to the beginning of the tape for each tape in the list
SKIP n tape list	Skip n save sets forward for each tape in the list
SKIP 0 tape list	Back up to the start of the current save set for each tape in the list
SKIP -n tape list	Skip n save sets backward for each tape in the list
UNLOAD tape list	Unload each tape from its drive for each tape in the list.

The following switches may be included within the file specification list for the action verbs. These switches can be either temporary or permanent. A temporary switch immediately follows the file to which it applies. A permanent switch precedes the list of files to which it applies, or may be typed on a separate line like a status setting verb.

Switch	Action
ABEFORE date	(On input file) include only if accessed before date
ASINCE date	(On input file) include only if accessed since date
BEFORE date-time	(On input file) include only if created before date-time
ERNONE	(On input file) give error if no files match
ERPROTECTION	(On input file) give error if there is a protection failure
ERSUPERSEDE	(On output file) do not restore from tape if on disk
ESTIMATE n	(On output file) estimate output size
LENGTH L:H	(On input file) include only if the file length is between L:H
MBEFORE date-time	(On input file) include only if modified before date-time
MSINCE date-time	(On input file) include only if modified since date-time
OKNONE	(On input file) do not give an error if no files match
OKPROTECTION	(On input file) do not give an error if there is a protection failure

OKSUPERSEDE	(On output file) always restore even if on disk
[NO]PHYSICAL	(Input or output) ignore logical names (Complement: accept logical names)
PROTECTION nnn	(On output file) set the protection code
SINCE date-time	(On input file) include only if created since the specified date-time
VERSION v	(On output file) set output file version number

17.3.4 Run-Time Commands

The following run-time commands may be given during the execution of the action verbs. BACKUP prompts with an exclamation point (!) when ready to accept a run-time command. (EXIT, HELP and RESET will also work with a slash (/) as a prompting character.)

The complements, formed by preceding the commands with NO, negate the commands and sometimes cause alternate actions; their effects are explained in parentheses.

The run-time commands are:

Commands	Action
[NO]DIRECTORIES	Start typing every directory processed (Complement: do not type these directories)
EXIT	Exit from BACKUP when done
[NO]FILES	Start typing every file and directory processed (Complement: do not type these files)
GO	Continue after a STOP
HELP	List these commands and explanations
KILL	Abort execution of the current action verb
PAUSE	Do not exit from BACKUP when done
RESET	Reset all status settings to their original defaults when done
SILENCE	Stop typing every directory or file
STOP	Stop temporarily: can be continued by GO.
WHAT	Display current filename and status

BACKUP also supports "/@ file" construction, allowing the use of indirect command files, like the COMPIL-class commands. All of BACKUP's verbs and switches, except for the run-time commands, may be used in an indirect file. (Note that "/verb @ file" is NOT a valid alternate format.)

17.4 EXAMPLES

The following examples demonstrate the application of the BACKUP program.

17.4.1 Console User Examples

The console user can execute all of the BACKUP commands on his own disk area. He can save his disk area or any other files accessible to him on his own magnetic tape and later restore to his area all his files or a subset of his files. In the following examples, the user is logged in under PPN [10,123].

17.4.1.1 Saving a User's Disk Area - To save all files on his own disk area on a magnetic tape mounted on MTA0, a user can type

```
.R BACKUP
/TAPE MTA0
/REWIND
/SAVE
!10,123 DSKB
 10,123 DSKC
DONE
/UNLOAD
/^C
```

17.4.1.2 Restoring Selected Files - The following example shows how to retrieve a specific file and a set of files from a BACKUP tape by using wildcards.

```
.R BACKUP
/TAPE MTA1
/REWIND
/RESTORE FOO.BAR, TST???.*
!10,123 DSKB
DONE
/UNLOAD
/^C
```

17.4.1.3 Renaming Files as They are Transferred - A user may choose to change a file's name or location path as it is moved between tape and disk. In the following example, the file name FILEA.MAC on tape is copied to disk as FILEB.MAC, but its path (device and directory level) is not changed.

```
.R BACKUP
/TAPE MTB0
```

```
/REWIND
/RESTORE FILEB.MAC=FILEA.MAC
!10,123 DSKB
DONE
/UNLOAD
/^C
```

In the next example, the file FILEC.MAC was located on DSKB in the user's UFD [10,123] when saved on tape, but it is restored to the sub-file directory SFD1 on DSKC.

```
.R BACKUP
/TAPE MTB0
/REWIND
/RESTORE DSKC:[10,123,SFD1]=DSKB:FILEC.MAC[10,123]
!10,123 DSKB
DONE
/UNLOAD
/^C
```

17.5 OPERATOR USES

An operator should periodically save the contents of the disk on magtape. This provides a backup capability should something unforeseen happen to the disk.

17.5.1 Saving the Entire Disk

To save the entire contents of DSKB on magtape and concurrently produce a directory listing, BACKUP is run while logged in under [1,2] as follows:

```
.R BACKUP
/TAPE MTA0
/LIST DSK:BACKUP.LOG
/SAVE DSKB:
!1,2 DSKB
 1,3
 1,4
  .
  .
  .
```

BACKUP types out each UFD as it begins to save files from that area. If the tape becomes full before the save is completed, BACKUP stops, types out the full file identification and block number of the current file being saved, unloads the magtape, and types the message

```
$BKPEOT REACHED EOT -- MOUNT NEW TAPE THEN TYPE "GO"
```

When GO is typed BACKUP continues the save on the new tape. (A file may be split across tapes.)

17.5.2 Recovering from a System Crash

If the system should crash during a save, for example while BACKUP is saving files from UFD [10,456], the operator, after bringing the system up, can instruct BACKUP to start at UFD [10,456] by using the /INITIAL switch:

```
.R BACKUP
/TAPE MTA0
/LIST DSK:BACKUP.LOG
/INITIAL DSKB:[10,456]
/SAVE DSKB:
!10,456 DSKB
   .
   .
   .
```

Note that any status parameters which were in effect before the crash must be reset, and that the tape should NOT be rewound. Note also that BACKUP does an append to the existing LIST spec.

17.5.3 Saving Only Recently Created or Modified Files

The procedure for saving only those files created or modified today is identical to that described in Section 3.2.1, with the additional inclusion of the /MSINCE status setting switch:

```
.R BACKUP
/TAPE MTA0
/LIST DSK:BACKUP.LOG
/MSINCE:YESTERDAY
/SAVE DSKB:
!1,2 DSKB
   .
   .
   .
```

Certain files and disk areas are automatically exempted from date-time restrictions. Files with the RP.ABU bit (always backup bit) set in the .RBSTS word of the RIB and PPN's of the form [A,*] and [10,B] where A and B are less then or equal to 7 are always exempted from date/time restrictions. This causes all libraries, etc., to always be saved and restored. (The PPN exemption can be overridden by using the /NOEXEMPT status setting verb.)

17.5.4 Restoring Only Recently Accessed Files

In the following example the /ASINCE switch is used to restore from tape only those files whose access date is later than June 1, 1975:

```
.R BACKUP
/TAPE MTA1
/ASINCE:1-JUN-75
/RESTORE
!
```

17.6 RESTORING FROM A DISTRIBUTION TAPE

BACKUP format distribution tapes are made in interchange mode, and related files are grouped together in named save sets. The user does not need to know what UFD the file was in when it was saved. Because the tapes are made in interchange mode, this information is not even included on tape. Suppose, for example, a new version of SCAN is on the current tape. The following commands to BACKUP transfer all files from only the SCAN save set onto ersatz device DEC:

```
.R BACKUP
/TAPE MTB0
/INTERCHANGE
/REWIND
/SSNAME SCAN
/RESTORE DEC:=DSK:
```

The save set name "ALL" can be used in place of SCAN to indicate that files from all save sets are to be copied.

17.7 OBTAINING DIRECTORIES OF BACKUP TAPES

The command

```
[N]PRINT spec
```

prints a directory of the entire tape. The optional prefix N indicates a narrow listing (72 columns). The default specification is LPT:BACKUP.LOG. If a line-printer is not available to the user's job, spooling is not in effect, and the default spec is used, an error will occur.

The following example produces a disk file directory listing named BACKUP.LOG.

```
.R BACKUP

/REWIND
/PRINT DSK:
!
```

This is an example of the output.

```
.TYPE BACKUP.LOG

     Start of save set SCAN on MTB401
     System     R5200  SYS #40/2 TOPS-10 monitor 602(13053) APR#40
     1600 BPI 9 track 18-Sep-75 13:09:13 BACKUP 2(155) format 1

     SCAN    REL     58      <055>   31-Mar-75       DSKB:   [10,4077]
     SCAN    RNO     8       <055>    8-Mar-75
     SCAN    MAC     304     <055>   31-Mar-75
     SCN7B   REL     59      <055>    4-Sep-75
     SCN7B   DO      101     <055>   18-Aug-75
     SCN7B   RNO     97      <055>   18-Aug-75
     SCN7B   CTL     3       <055>   24-Jul-75
     SCN7B   MAC     309     <055>    4-Sep-75
     SCAN    MEM     11      <055>   18-Sep-75

     End of save set SCAN on MTB401
     System     R5200  SYS #40/2 TOPS-10 monitor 602(13053) APR#40
```

```
1600 BPI 9 track 18-Sep-75 13:09:24 BACKUP 2(155) format 1

Start of save set BACKUP on MTB401
System     R5200  SYS #40/2 TOPS-10 monitor 602(13053) APR#40
1600 BPI 9 track 18-Sep-75 13:46:56 BACKUP 2(155) format 1

BACKUP  REL     22      <055>   15-Sep-75       DSKB:   [10,4077]
BACKRS  REL     52      <055>   17-Sep-75
BACKUP  SHR     55      <055>   17-Sep-75
BACKUP  LOW     34      <055>   17-Sep-75
BACKUP  MAC     118     <055>   15-Sep-75
BACKRS  MAC     270     <055>   17-Sep-75

BACKUP  RNH     19      <055>   15-Sep-75       DSKC:   [10,4077]
BACKUP  HLP     20      <055>   15-Sep-75
BACKUP  RNO     4       <055>   25-Aug-75
BACKUP  DOC     4       <055>   25-Aug-75
BACKUP  CTL     2       <055>   20-Aug-75

End of save set BACKUP on MTB401
System     R5200  SYS #40/2 TOPS-20 monitor 602(13053) APR#40
1600 BPI 9 track 18-Sep-75 13:47:13 BACKUP 2(155) format 1
```

17.8 COMPARING TAPE AND DISK FILES

The command

```
CHECK spec-list
```

Verifies that the tape and disk agree. BACKUP compares the tape files specified for input to the disk files specified for output, word for word.

The following example saves all the user's COBOL files on tape and then verifies that the saved tape files are identical to the disk files.

```
.R BACKUP

/TAPE MTA0:
/REWIND
/SAVE *.CBL
/REWIND
/CHECK
!
/
```

To restore all SHR and LOW files from a tape and then verify that the files were restored correctly type

```
/REWIND
/SSNAME ALL
/RESTORE *.SHR,*.LOW
!
/REWIND
/CHECK *.SHR,*.LOW
!
/
```

17.9 CHECKPOINTING LARGE FILES

Installations which maintain exceptionally large files (over 5000 blocks) will want to include the /CPOINT status setting switch when saving and restoring files. This switch extends BACKUP's system crash recovery capability to the file block level. During a checkpoint save, the typeout level is set to type the filenames and checkpoints as they are passed. To continue from the last checkpoint after a crash, the /INITIAL switch is used to indicate the file spec and the /RESUME switch to declare the checkpoint block number. For example:

```
.R BACKUP
/TAPE MTA0
/INITIAL DSKB:[40,577]DATBAS.DBS
/RESUME 6000
/SAVE
!40,577 DSKB
 DATBAS DBS
 RESUMING AT CHECKPOINT 6000
 7000
 8000
   .
   .
   .
```

Note that the tape should not be rewound to continue a checkpoint save.

During a checkpoint restore, the disk output file is closed at every checkpoint and then appended to. The procedure for continuing after a crash is the same as that for the checkpoint save, with the exception that the tape must first be rewound.

The default for checkpoints is 1000 blocks.

17.10 BACKUP MESSAGES

17.10.1 Operator Messages

$BKPEOT REACHED EOT -- MOUNT NEW TAPE THEN TYPE "GO"

The tape is full. The operator should mount a new one and then type GO to continue.

$BKPTWL TAPE WRITE LOCKED -- ADD WRITE RING THEN TYPE "GO"

The tape is write locked. The operator should insert a write ring and then type GO to continue.

17.10.2 Error Messages

?BKPABC AMBIGUOUS COMMAND

The user has given a command abbreviation that is not unique.

?BKPCOL CAN'T OPEN LISTING DEVICE

The device specified for the LIST command cannot be selected for output.

?BKPCOM CAN'T OPEN MAGTAPE

The tape device specified cannot be selected for output.

?BKPCSA CAN'T SAVE WITH SAVE SET NAME "ALL"

"ALL" is reserved to mean all SAVE sets on tape; therefore, it cannot be used to name an individual SAVE set when saving.

?BKPDND DEVICE NOT A DISK

The input device specified for a SAVE is not a disk.

?BKPDNM DEVICE NOT A MAGTAPE

The device specified for the TAPE command or a tape positioning command is not a magnetic tape drive.

?BKPFSL FILE SPECIFICATION DATA LOST

During the processing of a file specification list, a consistency check determined that data was lost. If this error occurs, please send an SPR.

?BKPHSG CANNOT GET HIGH SEGMENT BACK

BACKUP releases its high segment command scanner when performing I/O to eliminate most of the core while running. The attempt to restore the high segment after completing the I/O operation has failed.

?BKPIRC INVALID RUN TIME COMMAND -- TYPE KILL TO ABORT RUN FIRST

The user typed an illegal run time command. Type KILL to abort the run and return to verb command level. Type HELP to get a list of valid run time commands.

?BKPKDM KEYS DON'T MATCH -- PLEASE TRY AGAIN

BACKUP asks for the encryption key twice, and compares the keys for verification. This indicates that the comparison failed.

?BKPLFE LISTING FILE ENTER ERROR

After opening the listing I/O channel, no entry could be made for the listing file.

?BKPLSI LISTING SPECIFICATION INCORRECTLY FORMATTED

The user has used incorrect formatting or a "wild-card" in specifying the LIST file. No list specification is created.

?BKPNTS NO TAPE SPECIFIED

While searching for the last tape specification given, BACKUP could not fine one.

?BKPNZC NEGATIVE AND ZERO CHECKPOINTS ILLEGAL

The user specified a negative or zero argument with the RESUME command.

?BKPRES REACHED EOT ON A SINGLE REEL SAVE

This message is issued if and when the end of the tape is reached and the user has specified the /NOMULTIREEL command.

?BKPRTE REACHED TAPE ERROR MAXIMUM

BACKUP will abort the execution of an action verb and return to command level when a large number of tape I/O errors have occurred. Currently the error maximum is set to 10. (This is an assembly parameter.)

?BKPTMI INSUFFICIENT CORE FOR COMMAND

The routine for allocating space for file specifications could not expand core enough to store the specification.

?BKPTSI TAPE SPECIFICATION INCORRECTLY FORMATTED

The user has used incorrect formatting or a "wild-card" in specifying the tape device.

17.10.3 Warning Messages

%BKPABT ABORT spec

The transfer of the specified file from tape to disk has been aborted.

%BKPBTL BLOCK TOO LARGE READING SPEC (BLOCK = n)

The current record read from tape exceeds the buffer size. The record will be skipped.

%BKPCCM CANNOT COPY MFD FOR STRUCTURE

The program cannot get enough core to copy the Master File Directory for the indicated structure. Files for this structure will not be saved, and the program will skip to the next structure.

%BKPCCR CANNOT COPY UFD/SFD RIB FOR spec

The program cannot get enough core to copy the retrieval information block for the indicated directory. Files for this User File Directory/Sub-File Directory will not be saved, and the program will skip to the next UFD/SFD.

%BKPCCU COPY UFD/SFD FOR spec

The program cannot get enough core to copy the indicated User File Directory or Sub-File Directory. Files for this UFD or SFD will not be saved, and the program will skip to the next UFD/SFD.

%BKPCDF CANNOT DELETE FILE error bits (code) spec

The specified file could not be deleted. The error bits and code returned are listed in the DECsystem-10 Monitor Calls Manual, Appendix E.

%BKPCDS CHECK DISK FILE SHORTER spec

During a check operation, an end-of-file occurred for the

indicated disk file, even though there is more file data on tape.

%BKPCFD CHECK FILES ARE DIFFERENT spec

The check operation determined that the disk and tape versions of the idicated file are different.

%BKPCHK CHECKSUM INCONSISTENCY READING spec (BLOCK = n)

During a read, the computed checksum of the current tape record did not agree with the checksum stored when the record was written.

%BKPCNF CHECK FILE NOT ON DISK spec

The indicated file could not be found on disk during a check operation.

%BKPCOD CANNOT OPEN "file structure"

The file structure indicated cannot be selected for I/O. The transfer of files for this structure will be aborted.

%BKPCTS CHECK TAPE FILE SHORTER spec

During a check operation, and end-of-file occurred for the indicated tape file, even though there is more file data on disk.

%BKPDIO DISK I/O ERROR error bits DURING spec

A disk I/O error occurred while attempting to read or write the specified file. The error bits included are those returned by the monitor GETSTS call. The transfer will be aborted for this file.

%BKPFEE ENTER error-code spec

File enter error for the indicated file. The error code included is that returned by the monitor, and the error code abbreviation is listed in the DECsystem-10 Monitor Calls Manual, Appendix E.

%BKPFLE LOOKUP error-code spec

File lookup error for the indicated file. The error code included is that returned by the monitor, and the error code abbreviation is listed in the DECsystem-10 Monitor Calls Manual, Appendix E.

%BKPFRS FRS TAPES NOT SUPPORTED

On reading a tape, if the tape format seems to correspond to an FRS tape rather than a BACKUP tape, this message is issued and BACKUP continues scanning the tape for records in a format which it understands.

%BKPHSI HEADER FILE SPEC INCONSISTENCY

During a restore operation, a consistency check determined that the end-of-file record for the current file was missed, and the current record belongs to another file. The transfer will be aborted for this file.

%BKPIBL INCORRECT BLOCK LENGTH

During a read, the program encountered a tape record of the wrong size. The record will be skipped.

%BKPLF LISTING FILE ERROR error bits (code) spec

The listing file is closed and appended to after the processing of each UFD, so that it will be preserved through a system crash and recovery procedure. If either the LOOKUP or ENTER UUO for appending to the listing file fails, this message is issued and no further output is done to the listing file. The error bits and code returned are listed in the DECsystem-10 Monitor Calls Manual, Appendix E.

%BKPNBF NOT BACKUP FORMAT

The current tape record is not in BACKUP format, and the program will skip to the next tape record.

%BKPNEC NOT ENOUGH CORE

The program cannot get enough core. If this occurs during a RESTORE, the RESTORE will be aborted. During a Save, the program will skip to the next structure or User File Directory and attempt to continue.

%BKPNFF NO FILES FOUND TO MATCH spec

No files were found to match the given file specification.

%BKPRIC RESUME AT INVALID CHECKPOINT ATTEMPTED

This message indicates that the user instructed BACKUP to continue saving or checking a file at a checkpoint which was larger than the actual number of blocks in the file.

%BKPROD RESTORE OUTPUT DEVICE IS NOT A DISK

The output device specified for a RESTORE is not a disk.

%BKPSCE SIZE COPY ERROR spec

While transferring a file from tape to disk an error was encountered because the transferred file was not the same size as the tape file. If this error occurs, please send an SPR.

%BKPSLE SFD LEVEL EXCEEDED

While attempting to save needed Sub-File Directories the SFD level was exceeded.

%BKPSNF SAVE SET NOT FOUND name

This message may occur during a RESTORE or CHECK operation and indicates that the save set named with the last /SSNAME verb could not be found.

%BKPTHE TAPE HARDWARE ERROR READING/WRITING spec (BLOCK=n)

A hardware error occurred. The transferred file may contain unreliable data.

%BKPTPE TAPE PARITY ERROR READING/WRITING spec (BLOCK=n)

The hardware detected a parity error. The transferred file may contain unreliable data.

%BKPUOE UNTRACEABLE OUTPUT ERROR

An error was encountered while trying to move data from disk to tape.

%BKPURT UNKNOWN RECORD TYPE

While reading the tape, BACKUP found that the type number of the current tape record is not within the defined range. The program will skip to the next tape record.

17.11 CAPACITIES OF DISK MEDIA VERSUS MAGNETIC TAPE

The following table illustrates the maximum capacity of various disk devices and the approximate number of 2400-foot magnetic tapes required to hold the same number of blocks. The calculations were made for 9-channel magnetic tape at 800 bpi.

Disk Device	Capacity in Blocks	No. of magtapes Required for same capacity
RD10 (Disk)	4000	.139
RM10B (Drum)	2700	.094
RP02 (Disk Pack)	40000	1.39
RP03 (Disk Pack)	80000	2.78
RP04 (Disk Pack)	154280	5.37
RS04 (Disk)	2048	.071

17.12 BACKUP TAPE FORMAT

Note that Backup is designed for two primary functions: performing system backup and interchanging files between systems. For the latter function, Backup provides an "interchange" switch which causes system dependent data to be ignored and only critical file information to be written on tape. A restore operation in interchange mode also ignores system dependent data, allowing the operating system to supply defaults where necessary. Items not included in interchange mode are noted in the description which follows.

17.12.1 Tape Record Types

BACKUP tapes are made up of a series of tape records of various types. Each record is self identifying. All records on the tape are written at the standard length of 544(10) words, made up of a 32(10) word header and a 512(10) data area. Even if the data area is not needed, or is only partially needed it is fully written. All undefined or unused words are written with zeroes and ignored on read. This maximizes the probability of reading old tapes. In any case, the tape format is included in the labels and the save set headers.

The record types are:

1. T$LBL -- tape label used to identify reel ID and destruction date/time. This record is optional, but if present must be at the start of the tape.

2. T$BEG -- Beginning of a save set used to identify when the save set was written and on what device of what system. It also includes the save set name. This record is mandatory and must be the first record of the save set.

3. T$END -- end of a save set. This is identical to the T$BEG record except that it appears at the end.

4. T$FIL -- this is the actual data which has been saved. It is the only type of record which is encrypted. It is self-identifying as to the position within the file, but contains only part of the full path name of the file.

5. T$UFD -- contains the information for each directory. It gives all information necessary to re-create the directory. (Not written in interchange mode.)

6. T$EOV -- indicates end of volume (future).

7. T$COM -- comment (ignored).

8. T$CON -- continuation of save set. This is identical to T$BEG except that it indicates the continuation of the save set at the start of a new volume. This ensures that each volume is completely self identifying.

17.12.2 Standard Record Format

Every tape record has the same general format. This consists of a 32(10) word record header followed by one page of data (512(10) words). All record headers start with the same first twelve words. The first seven words are:

1. G$TYPE -- Record type as described in the previous section. This is a small positive integer.

2. G$SEQ -- record sequence number. This is incremented by one for each record on the tape. If a record is repeated because of a tape write error, the number of the repeated record is the same as that of the original.

3. G$RTNM -- relative tape number. This is incremented by one for each volume.

4. G$FLAG -- various flag bits:

   a. GF$EOF -- This flag is set if this is the last tape record for this disk file. On short files, this can even be set on the first record of the file.

   b. GF$RPT -- this flag is set if this tape record is a repeat of the previous record. This is set whenever the record is rewritten because of a tape write error.

c. GF$NCH -- this flag is set if no checksum has been computed for the tape record.

d. GF$SOF -- this flag is set if this is the first tape record for this disk file.

5. G$CHK -- checksum of the tape record.

6. G$SIZ -- number of words used for data in this tape record.

7. G$LND -- number of words to skip before the data starts.

The next four words are reserved for future expansion. The twelfth (last) word in the general section of the record header is reserved for customer use. The remaining 20 words in the record header vary for each record type, with the last word of each record header being reserved for customer use. In interchange mode, customer reserved words will be written as zero on a save and ignored on a read.

17.12.3 Non-Data Blocks

The data portion of a tape record is primarily for storing file data, but may be used for saving some overhead information. Any non-data information written in the data area of a tape record is prefaced with a control word of the form:

LH = type, RH = length in words including this word.

More than one overhead region can appear. In this case, they follow each other with no intervening space. The currently defined types for overhead blocks are:

1. O$NAME -- gives the full path identification of the file without punctuation. The path components are treated as if the user gave a quoted representation in "DEC Integrated Command Language". This block consists of sub-blocks in the standard order: device, directories (top down), file name, extension, version, generation. Sub-blocks corresponding to missing fields in the path specification are omitted. Each sub-block is in the format:

   WORD0: LH = type, RH = length in words including this word.

   The rest of the sub-block is the path field in ASCIZ without leading or imbedded nulls, terminated by at least one null. Omitted fields will be defaulted. In interchange mode, only the name, extension and version are written. In interchange restore, only name, extension and version are used.

   sub-block type codes are:

   1 = device
   2 = name
   3 = extension
   4 = version
   5 = generation
   40 = directory (lower directories are 41, 42, ...)

2. O$FILE -- a block containing file attributes. The first section of this block is a fixed length header area containing in fixed locations either single word attributes

or byte pointers to ASCIZ string attributes located in the remaining section. All dates and times are in universal date/time format. In interchange mode only the critical attributes (starred) will be written, and the rest of this block will contain zeros. In the description which follows, the symbols in brackets represent the RIB data from which the attribute values will be converted. (If none is given, the location will be zero.)

a. A$FHLN (*) -- fixed header length in words.

b. A$FLGS -- flags:

    1. B$PERM -- permanent (not deletable) [RP.NDL]

    2. B$TEMP -- temporary

    3. B$DELE -- already deleted

    4. B$DLRA -- don't delete for lack of recent access [RP.ABU}

    5. B$NQCF -- not quota checked [RP.NQC]

    6. B$NOCS -- does not have valid checksums [RP.ABC]

    7. B$CSER -- has checksum error [RP.FCE]

    8. B$WRER -- has disk write error [RP.FWE]

    9. B$MRER -- had BACKUP read error on RESTORE [RP.BFA]

    10. B$DAER -- declared bad by damage assessment [RP.BDA]

c. A$WRIT (*) -- date/time of last write [RB.CRD and RB.CRT]

d. A$ALLS (*) -- allocated size in words [.RBALC]

e. A$MODE (*) -- mode of last write [RB.MOD]

f. A$LENG (*) --length in bytes (1B0 if > 2^35-1) [.RBSIZ]

g. A$BSIZ (*) -- byte size (7 or 36).

h. A$VERS (*) -- version identification (.JBVER format) [.RBVER]

i. A$PROT -- protection [RB.PRV]. The protection for directories appears in the directory attribute block (O$DIRT). For files, the protection word is defined as four fields of eight bits each with a "5" stored in the leftmost three bits in order to avoid looking like a byte pointer:

    bits 0-2 "5"

    bit 3 reserved for future

    bits 4-11 future access

    bits 12-19 owner access

    bits 20-27 affinity group access

bits 28-35 "world" access

Each file access field is subdivided into bytes which describe the attribute, write and read (respectively) protections associated with the file. A description of the "world" access field follows, with the associated TOPS-10 protection given in parentheses, if applicable. The owner and affinity group (project) fields are similarly defined.

1. PR$SPC (bit 28) -- reserved for special checking. The rest of the field is special if this bit is set.

2. PR$ATR (bits 29-31) -- the attribute subfield is a 3-bit byte interpreted as follows:

   0 -- file is completely hidden.

   1 -- file name is visible (7-6).

   2 -- file attributes are visible (5-2).

   3 -- can change unprotected attributes.

   4-5 -- (future)

   6 -- can change protection (0).

   7 -- can delete the file (1).

3. PR$WRT (bits 32-33) -- the write access subfield is defined as:

   0 -- no write access (7-5).

   1 -- append (4).

   2 -- write (3).

   3 -- superseding generation (2-0).

4. PR$RED (bits 34-35) -- the read access subfield is defined as:

   0 -- no read access (7).

   1 -- execute only (6).

   2 -- can read the file (5-0).

   3 -- (future).

j. A$ACCT -- byte pointer to account string

k. A$NOTE -- byte pointer to annotation string [.RBSPL]

l. A$CRET -- creation date and time of this generation

m. A$REDT -- last read date and time of this generation [RB.ACD]

n. A$MODT -- monitor set last write date and time [.RBTIM]

o. A$ESTS -- estimated size in words [.RBEST]

p. A$RADR -- requested disk address [.RBPOS]

q. A$FSIZ -- maximum file size in words

r. A$MUSR -- byte pointer to identification of last modifier

s. A$CUSR -- byte pointer identification of creator [.RBAUT]

t. A$BKID -- byte pointer to identification of previous BACKUP [.RBMTA]

u. A$BKDT -- date and time of last backup

v. A$NGRT -- number of generations to retain

w. A$NRDS - number of opens for read this generation

x. A$NWRT -- number of opens for write this generation

y. A$USRW -- undefined user word [.RBNCA]

z. A$PCAW -- privileged customer word [.RBBCA]

The remainder of this block is reserved for future expansion.

3. O$DIRT -- a block containing directory attributes (not written in interchange mode). The first section of this block is fixed length header area containing either directory attributes or pointers to attributes located in the remaining section. The symbols in brackets represent the RIB data used for conversion (the location is zero if none is given). The directory protection word appears in this block rather than in the O$FILE block (A$PROT is zero for directories).

a. D$FHLN -- fixed header length in words

b. D$FLGS -- directory flags:

1. DF$FOD -- file only directory

2. DF$AAL -- alpha accounts are legal

3. DF$RLM -- repeat login messages

c. D$ACCT -- account number or ASCII byte pointer to account string

d. D$PROT -- directory protection [RB.PRV]. The directory protection word is divided into the same access fields as the file protection word, A$PROT, but each directory access field has bits as follows (RIB bits given in parentheses):

Bit 28 -- reserved for special checking. The rest of the field is special if this bits is set.

Bits 29-31 -- (future)

Bit 32 -- connect allowed

Bit 33 -- can open files (4)

Bit 34 -- can create generations (2)

Bit 35 -- directory can be read (1)

e. D$FPRT -- default file protection

f. D$LOGT -- date/time of last login in DEC-10 universal format [RB.CRD and RB.CRT]

g. D$GENR -- default number of generations to keep

h. D$QTF -- first-come-first-served logged-in quota in words [.RBQTF]

i. D$QTO -- logged out quota in words [.RBQTO]

j. D$ACSL -- list of groups which can access this directory (see below)

k. D$USRL -- list of groups which this user is in (see below)

l. D$PRVL -- privilege list (see below)

m. D$PSWD -- ASCII byte pointer to password

The list attribute words given above (D$ACSL, D$USRL, D$PRVL) may be in any one of the following formats:

a. an ASCII string pointer

b. 5B2 + group (or 5B2 + privilege for D$PRVL)

c. -N,, Relative location of start of list

If in format (c), each word of the list is 5B2 + group (5B2 + privilege for D$PRVL)

4. O$SYSN -- a block containing the system header line in ASCIZ.

5. O$SSNM -- a block containing the user supplied save set name in ASCIZ (max of 30 characters). This block is omitted if no save set name was specified.

17.12.4 Locations in T$LBL Record

This record has no contents in the "data" region. The remaining locations in the record header are defined as follows:

1. L$DATE -- date/time of labelling in DEC-10 universal format (i.e., LH=DAYS since 17-NOV-1858, RH=FRACTION of day)

2. L$FMT -- BACKUP tape format (constant = 1).

3. L$BVER -- version of BACKUP writing label in standard .JBVER format.

4. L$MON -- monitor type (%CNMNT).

5. L$SVER -- system version (%CNDVN).

6. L$APR -- APR processor serial number on which this label was written (integer).

7. L$DEV -- physical device on which the tape was written in SIXBIT.

8. L$MTCH -- BTYE (31) 0 (1) 7-track (1) 0 (3) density. Density is 1=200, 2=556, 3=800, 4=1600, 5=6250.

9. L$RLNM -- REELID in SIXBIT.

10. L$DSTR -- date/time before which the tape cannot be scratched. Before this time, the only valid operation is to append.

17.12.5 Locations in TBEG, TEND, T$CON Records

These save set records all have the same format and are distinguished by their record types and their location on the tape. All items are filled in at the time of writing. The data area contains two non-data blocks, types O$SYSN and O$SSNM. Record header locations following the first standard twelve words are defined as follows:

1. S$DATE -- date/time of writing this record in universal format.

2. S$FMT -- BACKUP tape format (constant = 1).

3. S$BVER -- BACKUP version in .JBVER format.

4. S$MON -- monitor type (%CNMNT).

5. S$SVER -- system version (%CNDVN).

6. S$APR -- apr serial number on which written.

7. S$DEV -- physical name of device on which written in SIXBIT.

8. S$MTCH -- BYTE (31) 0 (1) 7-track (1) 0 (3) density. Density is 1=200, 2=556, 3=800, 4=1600, 5=6250.

17.12.6 Locations in T$UFD Record

This record is not written in interchange mode. When written, the data portion contains two or three non-data blocks: types O$NAME, O$FILE (optional) and O$DIRT. Remaining locations in the header record contain:

1. D$PCHK -- checksum of the O$NAME full path file name block.

2. D$LVL -- directory level: 0=UFD, 1=first SFD, etc.

3. D$STR -- file structure name stored in the following format: BYTE (7) data type, length in words, ASCII. (Date types are defined in the T$FIL section.)

17.12.7 Locations in T$FIL Record

The first tape record for a file contains two non-data blocks, types O$NAME and O$FILE. There is room for two blocks of file data in the first tape record, and if the file will completely fit in one tape record, these will be used. If the file is longer than two blocks, the file will be started in the second tape record, so its pages will be lined up with tape records. Each tape record identifies the logical disk word with which it starts. Remaining locations in the record header are:

1. F$PCHK -- checksum of the full path file name block (O$NAME). This is just a consistency check for consecutive records of the file.

2. F$RDW -- relative data word of file of the first data word in this tape record.

3. F$PTH -- a twelve word block used to store information suitable for a restoration of the file. This area is big enough to hold the entire path to a TOPS-10 file in a UFD and two SFDS. The path information will be stored in the standard order of device, UFD, first SFD, file name, extension; with missing fields omitted. The path information will be stored in the format:

   BYTE (7) data type, length in words, ASCII

   where data types are defined as:

   device = 001

   file name = 002

   extension = 003

   directory = 040

   (lower directories = 041,042, ...)

CHAPTER 18

BOOTM

18.1 INTRODUCTION

BOOTM is a bootstrap program used for loading the monitor from a magnetic tape saved in BACKUP format. BOOTM runs in EXEC mode, and automatically loads itself into the top 2K of memory. You load BOOTM either from magnetic tape via the READIN facility or from paper tape.

18.2 OPERATION

DIGITAL supplies BOOTM on either a paper tape or a bootstrap magnetic tape.

18.2.1 Load From Paper-tape (KA/KI Only)

You should follow the steps outlined below to load BOOTM from paper tape.

1. Load the BOOTM paper tape into the paper-tape reader.

2. Set the READIN device switches to 104.

3. Press STOP, RESET, and READIN.

4. When the paper tape has been read, BOOTM types:

```
BOOTM  V4(16)
BTM>
```

   The prompt characters, indicating that you can type a command, are BTM>.

5. Type a command string and press the RETURN key.

6. After BOOTM processes the command you typed, BOOTM either restarts itself or transfers to the newly loaded program. The action BOOTM takes depends on the command you type.

18.2.2 Load From Magnetic Tape

You should follow the steps outlined below to load BOOTM from magnetic tape.

1. Place the BOOTM tape on magnetic tape drive 0 (e.g., MTA0). If you're using a DX10 controller, you can use any drive.

2. Set the READIN switches to 340. When using a DX10 controller, set the switches to 220.

3. Press STOP, RESET, and READIN.

4. When the magnetic tape has been read, BOOTM types:

   ```
   BOOTM  V4(16)
   BTM>
   ```

   The prompt characters, indicating that you can type a command, are BTM>.

5. Type a command string and press the RETURN key.

6. After BOOTM processes the command you typed, BOOTM either restarts itself or transfers to the newly loaded program. The action BOOTM takes depends on the command you type.

18.3 COMMAND FORMAT

The general format of a BOOTM command is shown below.

```
structure:file.ext[proj,prog]/switch
```

where: structure represents a file structure name within the disk file system (as saved by BACKUP). The default is DSKB.

file.ext is the name and extension of the file involved in the loading operation. The default is SYSTEM.EXE.

[proj,programmer] is the directory in which the specified file can be found. The default is [1,4].

/switch is an optional BOOTM switch that specifies what operation or option BOOTM should perform. The available options and operations are listed in Section 6.3.1.

18.3.1 Options and Operations

If you do not specify a switch in the command, 1) BOOTM finds the specified file, 2) clears memory, 3) reads the specified file into memory, 4) sets the PROGRAM START ADDRESS, and 5) starts the program at that address. The default file used is DSKB:SYSTEM.EXE[1,4]. BOOTM positions the tape to the second file on the tape before it starts the program.

The possible switches that you can specify in the BOOTM command line are listed below.

/LOAD BOOTM performs all the operations listed above, except that it does not start the program (i.e., does not perform step 5).

/START:n BOOTM performs all the operations listed above, except it starts the program at location n. The default value for n is the start address specified in the file.

/NOREWIND BOOTM is disabled from repositioning the tape to the second file, which is assumed to be a copy of BACKUP.EXE.

/DENSITY:d Set the tape read density to the value of d. Legal values are 200, 556, 800, and 1600.

/kontroller:u Inform BOOTM what type of tape controller you are reading from and the unit "u" that has the tape mounted. Legal values for "kontroller" are TM10, TX01, TM02, and TC10. If READIN was done from either a TM10 or a TX01, then it is not necessary to specify this switch. The default tape drive is the unit that a READIN was performed on if a TM10 or a TX01 was used. If BOOTM was read in from a device other than magtape, then the default is TM10 unit 0. If a TC10 controller is used, it must be specified by a /TC10 switch. The default value for u is unit #0. Example: /TX01:2 specifies unit 2 on the TX01 controller.

/REWIND This operation will rewind the tape to load point. /DENSITY and /kontroller above may be used in conjunction with this switch; however, no filename can be given.

/SKIP This operation will skip forward over one file. Options 5 and 6 above may be used in conjunction with this command; however, no filename can be given.

18.4 ERRORS

Whenever BOOTM encounters an error, the following style of error message appears:

1. The user terminal end-of-line bell is rung;

2. The string ?BTM followed by a 3-character mnemonic followed by the error message text terminated by a carriage return and line feed;

3. BOOTM is then restarted.

18.4.1 Error Messages

```
?BTMIPP - Invalid PROJ,PROG number
?BTMCME - Command error
?BTMISW - Illegal switch or argument
?BTMFNF - File not found
?BTMTSF - Tape mark in save file
?BTMSFI - Save file inconsistent
?BTMNSA - No start address
?BTMNDL - Not an EXE file or directory too long
?BTMPNM - Page not monotonically increasing
?BTMTRE - Tape read error
?BTMCSD - Cannot start DX10
?BTMCSE - Channel synchronization error
?BTMNMS - No magtape status
?BTMFDE - Fatal DX10 error or drive off-line
?BTMNES - Not ending status (TU70 only)
?BTMNCS - Not CU status (TU70 only)
```

18.5 ASSEMBLY INSTRUCTIONS

The following feature test switches are available in BOOTM:

FTEXE	Include EXE file support (default)
FTFRS	Include FRS/BACKUP file format (default)
FTTU70	Include TU70 support (default)
FTTC10	Include TC10 support (default)
MAGRIM	Assemble in MAGRIM format (default)
PTPSW	Make paper tape version (normally off)
CORE	Value set to 5000 (default) used to determine where to readin BOOTM before relocation.
DEBUG	Make debug version

Assembly instructions:

1. To make a paper tape version (location independent):

```
.MAKE BTMPTP.MAC
*IPTPSW==1
MAGRIM==0
$EX$$
.R MACRO
*PTP:=BTMPTP,BOOTM
```

2. To make a file that can be copied to a magtape for READIN, just assemble with no special switches.

3. To make a file that can be loaded with DXLD to make a TU70 readin tape:

```
.MAKE BTMDX.MAC
*IMAGRIM==0
$EX$$
.LOAD DXLD,BTMDX+BOOTM
.ASSIGN DSK OUT
.START   ;This produces BOOTM.RDI
```

18.6 EXAMPLES

To retrieve and run a fresh monitor from a BACKUP format magtape containing DSKB:SYSTEM.EXE(1,4), type a carriage return only.

To rewind a tape on TM10 drive #3 type:

```
/REWIND/TM10:3
```

To load RV765 from DSKB:[10,2362] on a BACKUP format tape and start EXEC DDT type:

```
RV765[10,2362]/START:401
```

18.7 SPECIAL 1080 INSTRUCTIONS

There is no readin on KL10 CPUs. See the Operators Guide for instructions for readin in BOOTM on 1080s. Be sure to specify /TX01, when reading in a tape on a TU70.