

Operator's Guide

Order Number: AA-4176C-TM

January 1978

This document gives the computer operator a task-oriented reference for operating the DECSYSTEM-20, a brief description of the DECSYSTEM-20 hardware and software components, and a reference for privileged commands.

OPERATING SYSTEM: TOPS-20 Version 3

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First Printing, March 1976
Revised, August 1976
Updated, May 1977
Revised, January 1978

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PREFACE

This guide, written for an experienced computer operator, gives an overview of the DECSYSTEM-20 hardware and software and serves as a task-oriented reference for operating the DECSYSTEM-20. Appendix A contains detailed information on privileged commands. Appendix B contains a detailed description of KLINIT, and Appendix C describes the PARSER operator commands. You should read and understand these three appendixes before you attempt any of the tasks in Chapters 3 through 6. Appendix D, for reference only, has a one-line explanation for each BUGCHK and BUGHLT.

Although various installations may run their systems differently, this guide describes one set of procedures for running a DECSYSTEM-20 with standard hardware and software. Each installation should tailor these procedures to suit its needs and add procedures for specific applications.

This guide is dependent on other manuals. It assumes that you, the operator, have read, understood, and used Getting Started With DECSYSTEM-20. Sometimes, the text refers to another manual for more information; therefore, you should have the latest editions of the following documents available.

1. DECSYSTEM-20 Batch Operator's Guide
2. DECSYSTEM-20 User's Guide
3. DECSYSTEM-20 Software Installation Guide
4. DECSYSTEM-20 USAGE File Specification
5. DECSYSTEM-20 Error Detection, Recovery, and Reporting Reference Manual
6. TOPS-20AN User's Guide (if your installation has TOPS-20AN software)

Also, Appendix A of the DECSYSTEM-20 Monitor Calls Reference Manual lists error messages that you may want to refer to when you see an error message not documented in this guide.

The following conventions are used in this guide.

CTY means console terminal.

PTY means pseudo-terminal.

RET indicates that you press the RETURN key--not shown in examples except in a few cases to

provide clarity, because all lines are assumed to end with `(RET)`.

CTRL/character

indicates that you hold the CTRL key down while typing the character.

^character

is the output from typing CTRL/character or, if otherwise noted, indicates that you first type up-arrow and then type the character.

CHAPTER 1

RESPONSIBILITIES OF THE OPERATOR

As a DECSYSTEM-20 operator, you are responsible for keeping the system running and providing users the best possible service. To do this, you must be aware of all the system resources available, know how to interact with the system and with users, and be able to recognize and solve problems before they become serious.

Your first task in starting the system is to load the front-end and main processor monitors. After that, the system starts a series of programs to support batch and timesharing users. Then, you must check the status of jobs, respond to user requests, and perform routine system tasks such as replenishing the paper supply for a line printer or cleaning magnetic tape drives.

Because the system is complex, sometimes a monitor ceases to function, i.e., it crashes. A crash may result from software (programming), hardware, or environmental problems. When a crash occurs, you must recognize the symptoms, take the appropriate corrective steps to get the system back up as quickly as possible, and save important information about the crash.

To keep informed of your responsibilities and to perform the necessary operator tasks, you should read and have available for reference all documentation relevant to an operator.

1.1 DOCUMENTATION

Be sure you use all available documentation, including that supplied by DIGITAL, your installation, and other operators. The next three sections describe the documentation available from these sources.

1.1.1 Supplied by DIGITAL

DIGITAL supplies many manuals for the DECSYSTEM-20. Those helpful to an operator, in addition to this manual, are:

1. Getting Started With DECSYSTEM-20
2. DECSYSTEM-20 Batch Operator's Guide
3. DECSYSTEM-20 User's Guide
4. DECSYSTEM-20 Software Installation Guide

RESPONSIBILITIES OF THE OPERATOR

5. TOPS-20AN User's Guide (if your system runs TOPS-20AN for ARPANET)

DIGITAL also supplies some text files on the magnetic tapes used for software distribution. These files can be identified by their file type: .HLP, .MEM, .BWR, or .DOC. Many of them are usually in a disk directory from which you can list or type them.

1.1.2 Written at Your Installation

Your installation personnel may add to the system some text files that can be listed or typed.

You should also have a list of specific duties for each operator shift. This list should be written by the system manager and operations staff, using this manual as a guide. Your installation personnel can also tailor this manual to their needs. For example, installation-specific instructions, such as locking computer room doors, finding paper, and running application programs, can be added.

1.1.3 Written by Operators

Your system manager should give you an operator's notebook and a system logbook which contain pages you must fill out to record what happens systemwide.

The operator's notebook should record shift-to-shift communication among operators, and between operators and the system manager. Always read it before you begin your shift. Notebook entries might include scheduled system downtime, new software to install or try, problems met on preceding shifts, and specific instructions not in the normal schedule.

The system logbook should be used to note important events relative to the system availability. The entries should include monitor reload time, hardware problems, and system shutdown time. To identify the items easily, you should separate hardware and software entries, perhaps listing hardware entries on left-hand pages and software entries on right-hand pages. You should check this log when you start work; be sure to keep it current throughout your shift.

You should also save the output from the CTY. Your system manager should determine how long to keep it and where to file it. It can be a useful reference when there are system problems.

1.2 OPERATIONAL TASKS

To keep a system running efficiently, you must perform certain hardware and software tasks. These may be part of a daily, or less frequent schedule, or done as required.

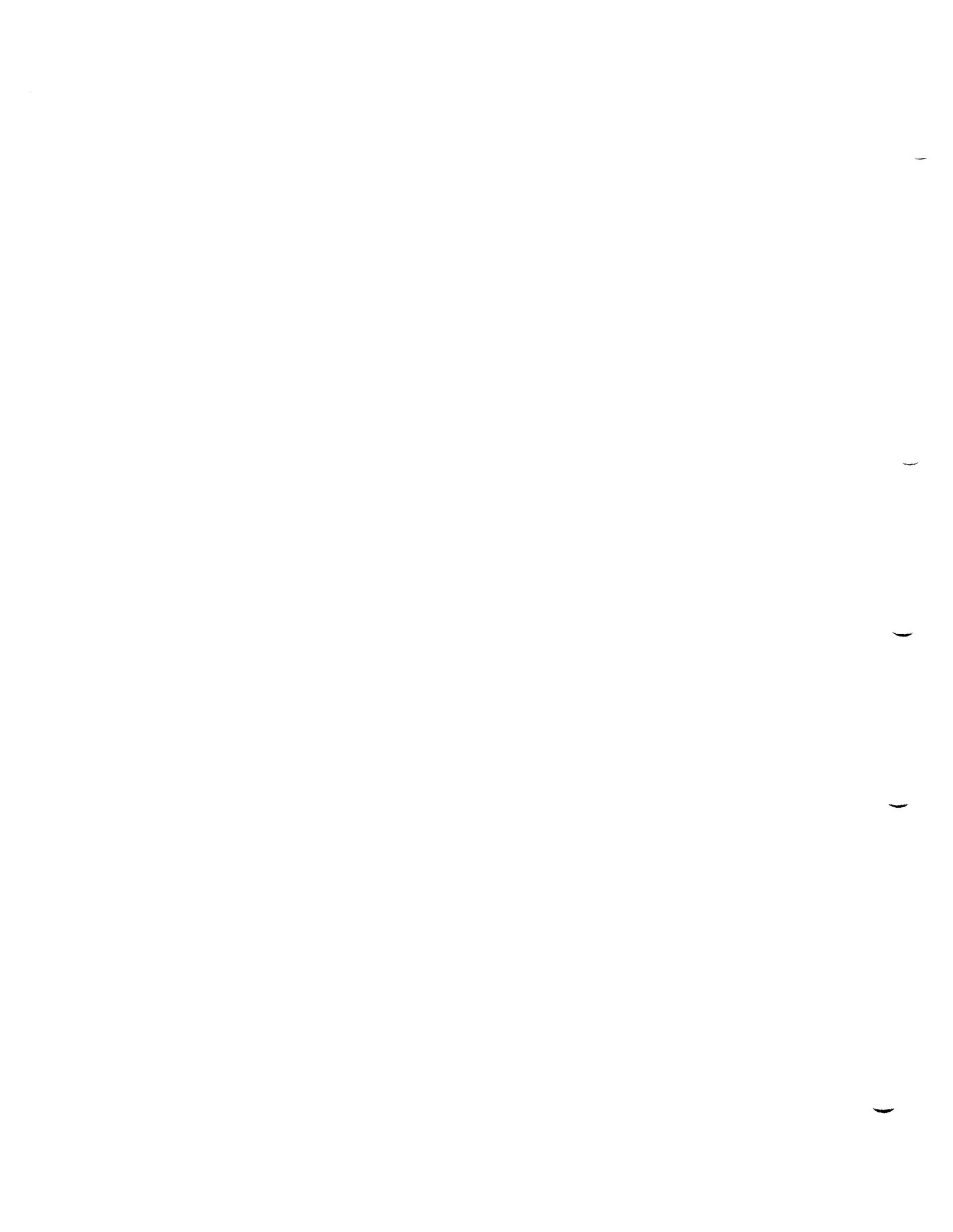
RESPONSIBILITIES OF THE OPERATOR

1.2.1 Hardware Tasks

Hardware tasks include cleaning certain devices, replenishing paper for input/output devices, operating the hardware components of the system, and keeping the computer room clean. (See Chapters 2 and 7 for details.)

1.2.2 Software Tasks

Software tasks include loading and starting the system, running operator service programs, interacting with users, and performing error recovery procedures. (See Chapters 3 through 6 for details.)



CHAPTER 2

SYSTEM FAMILIARIZATION

To improve your understanding of the system, this chapter briefly describes the DECSYSTEM-20 hardware and software.

2.1 DECSYSTEM-20 HARDWARE

In general, the system consists of a central processor, memory, mass-storage controllers, a console front-end processor, an optional communications front-end processor, and various peripherals.

2.1.1 Central Processor

The KL central processor, which directs the operation of the entire DECSYSTEM-20, contains a microcoded instruction set (383 instructions), fast integrated-circuit general-purpose registers, and interrupt and trap facilities. The central processor, internal memory, and mass-storage controllers are combined in two cabinets.

2.1.2 Memory

Memory storage ranges from 96K words to 512K words (K=1024) of internal memory (MA20 or MB20), each word having 36 bits of data and 1 parity bit. Memory cycle time is 1.28 microseconds for a single access. Memory can be 1-, 2-, or 4-way interleaved, and up to four data words may be accessed by a single memory reference.

2.1.3 Console Front-End Processor

The console front-end processor handles the line printers, card reader, floppy disks, terminals, console functions, diagnostics, microcode loading, memory configuration, and system startup. It is in the cabinet to the left of the two cabinets containing the central processor, internal memory, and mass storage controllers. The console front-end processor communicates with the central processor through the DTE-20 interface. The front-end memory is 28K of 18-bit words (16 data bits and 2 parity bits). The floppy disk is used for initial system loading.

SYSTEM FAMILIARIZATION

2.1.4 Peripherals

The standard DECSYSTEM-20 peripherals are described below. Peripherals supported by DIGITAL's Advanced Systems Group are discussed in the installation guides for those peripherals.

(Chapter 7 describes the operation and maintenance of peripherals.)

Line Printers

The line printers currently available are:

1. The LP05-V with a 64-character print set, a speed of 300 lines per minute, and a direct access, vertical format unit. This printer is included in the LP20A line printer system.
2. The LP05-W with a 96-character print set, a speed of 230 lines per minute, and a direct access, vertical format unit. This printer is included in the LP20B line printer system.
3. The LP14-V with a 64-character print set, a speed of 890 lines per minute, and a direct access, vertical format unit. This printer is included in the LP20C line printer system.
4. The LP14-W with a 96-character print set, a speed of 650 lines per minute, and a direct access, vertical format unit. This printer is included in the LP20D line printer system.
5. The LP10-J with a 64-character print set, a speed of 1250 lines per minute, and a standard sprocketed carriage tape for the vertical format unit. This printer is included in the LP20F line printer system.
6. The LP10-K with a 96-character print set, a speed of 925 lines per minute, and a standard sprocketed carriage tape for the vertical format unit. This printer is included in the LP20H line printer system.

All the line printers are 132-column devices. Those with the 96-character print set have upper and lower case.

The line printer controller is called an LP20.

Card Readers

The card reader can be a table model (Model M200) that processes 285 cards per minute or a console model (Model M1200) that processes 1200 cards per minute. Both accept 80-column EIA/ANSI standard cards. Only the M1200 reader has a mechanical EOF button. The table model is included in a CD20A card reader system, and the console model is included in a CD20B card reader system.

The CD11 card reader controller is included in a CD20 card reader system (controller and reader).

Disk Packs

The system supports the RP04 disk pack, which has a 20-million word (36-bit word) capacity, and the RP06 disk pack, which has a 40-million word (36-bit word) capacity. The drives for these disk packs provide error detection and correction hardware as well as high-speed access and transfer rates.

SYSTEM FAMILIARIZATION

The disk drives have an RH20 integrated controller and data channel for access by the central processor. The console front-end processor accesses a disk drive through an RH11 disk controller if the drive has the dual-port option.

Magnetic Tape

The TU45 magnetic tape transports use standard 9-track recording formats with densities of 1600 bits/inch (63 rows/mm) or 800 bits/inch (31 rows/mm).

The TU45 is interfaced to an RH20 integrated controller and data channel through a TM02 or TM03 slave controller. Device error messages include the number of the TM02 or TM03.

Terminals

DEC terminals supported by the DECSYSTEM-20 are the VT50 and VT52 DECscope, the LA30 DECwriter, and the LA36 DECwriter II.

2.2 DECSYSTEM-20 SOFTWARE

2.2.1 Operating Systems And Other Major Software Components

The operating system for the DECSYSTEM-20 is called the TOPS-20 monitor. If the DECSYSTEM-20 is on the ARPANET (Advanced Research Projects Agency Network), the operating system is called the TOPS-20AN monitor. Either monitor supports timesharing and batch processing concurrently.

The TOPS-20 command language, or command processor, is sometimes called the EXEC.

The RSX-20F console front-end operating system aids the central processor and TOPS-20 by doing such tasks as handling the console, terminal communications, peripherals, and diagnostics.

2.2.2 Languages

The following languages are available on the DECSYSTEM-20.

- ALGOL
- APL
- APLSF
- BASIC-PLUS-2
- COBOL
- FORTTRAN
- MACRO

They can be used under batch and timesharing. There are also debugging programs available for programs written in these languages.

SYSTEM FAMILIARIZATION

2.2.3 Utilities

Many utilities are available for DECSYSTEM-20 users. Some of the more important ones are:

- BATCH - A group of programs to handle batch jobs concurrently with timesharing jobs
- DDT - A debugging utility
- DUMPER - A utility to back up disk files
- EDIT - An editor for creating and modifying programs and data files
- LINK - A linking loader
- SORT - A utility for sorting records of one or more files according to a user-specified sequence

Specific utilities for the operator are discussed in later sections of this manual.

The white load switches are labeled in Figure 3-1 as SW REG, DISK, FLOPPY, and ENABLE. Their purpose is given below.

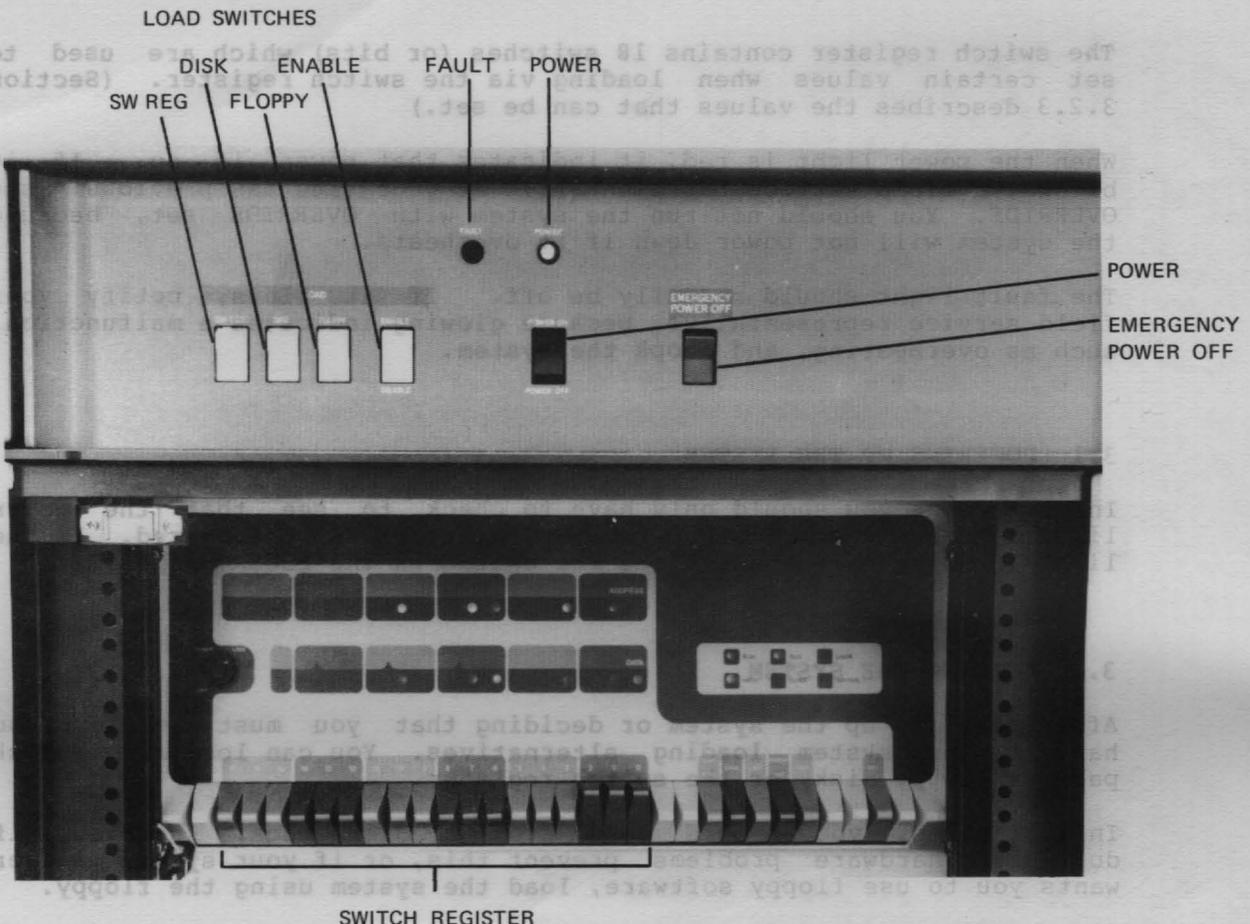
PURPOSE	LOAD SWITCH
Loads the system according to the contents of the switch register (Section 3.2.3)	SW REG
Loads the system from a disk pack (Section 3.2.1)	DISK
Loads the system from a floppy disk (Section 3.2.2)	FLOPPY
Enables loading via SW REG, DISK, or FLOPPY	ENABLE

CHAPTER 3

STARTING THE SYSTEM

The black power switch, labeled POWER ON and POWER OFF, normally Before starting the DECSYSTEM-20, you must become familiar with a few switches and lights on the processor (Figure 3-1).

The four load switches and two power switches are on the leftmost cabinet to the right of the DECSYSTEM-20 label. Just above them are the fault and power lights. The switch register is located behind the door below the load and power switches.



SWITCH REGISTER

Figure 3-1 Load Switches and Switch Register

STARTING THE SYSTEM

The white load switches are labeled in Figure 3-1 as SW REG, DISK, FLOPPY, and ENABLE. Their purpose is given below.

LOAD SWITCH	PURPOSE
SW REG	Loads the system according to the contents of the switch register (Section 3.2.3)
DISK	Loads the system from a disk pack (Section 3.2.1)
FLOPPY	Loads the system from a floppy disk (Section 3.2.2)
ENABLE	Enables loading via SW REG, DISK, or FLOPPY

The black power switch, labeled POWER ON and POWER OFF, normally supplies power to the system. The red EMERGENCY POWER OFF switch should be used only in emergencies, such as a fire, when you must turn off the power as quickly as possible.

CAUTION

After you press the EMERGENCY switch, you must call your field service representative to restore power.

The switch register contains 18 switches (or bits) which are used to set certain values when loading via the switch register. (Section 3.2.3 describes the values that can be set.)

When the power light is red, it indicates that power is on. If it blinks, a field service representative at your site has previously set OVERRIDE. You should not run the system with OVERRIDE set, because the system will not power down if it overheats.

The fault light should normally be off. If it glows, notify your field service representative, because glowing indicates a malfunction, such as overheating, and stops the system.

3.1 POWERING UP THE SYSTEM

In most cases you should only have to check to see that the power light over the black POWER ON/POWER OFF switch is glowing red. If the light is not glowing red, place the switch in the POWER ON position.

3.2 LOADING THE SYSTEM

After powering up the system or deciding that you must reload, you have a few system loading alternatives. You can load from a disk pack, a floppy disk, or the switch register.

In most cases, you should load from a disk pack. However, if dual-port hardware problems prevent this, or if your system manager wants you to use floppy software, load the system using the floppy.

If you have to load the system using nondefault paths, use the switch register. This lets you load from a disk pack or floppy unit and also enter the KL initialization operator dialog (KLINIT). KLINIT lets you take nondefault paths, e.g., configuring memory yourself, loading a bootstrap from any file, and loading a nondefault monitor.

STARTING THE SYSTEM

LOADING FROM DISK PACK

Sample Output

RSX-20F YB10-44 11:39 25-OCT-77

[SY0: REDIRECTED TO DB0:]

[DB0: MOUNTED]

KLI -- VERSION YB06-07 RUNNING

KLI -- MICROCODE VERSION 202 LOADED

KLI -- ALL CACHES ENABLED

LOGICAL MEMORY CONFIGURATION:

CONTROLLER

ADDRESS	SIZE	RQ0	RQ1	RQ2	RQ3	CONTYPE	INT
00000000	128K	00	01	00	01	MA20	4
00400000	64K	02	03	02	03	MA20	4

KLI -- BOOTSTRAP LOADED AND STARTED

[PS MOUNTED]

SYSTEM RESTARTING, WAIT...

ENTER CURRENT DATE AND TIME: 9 NOV 77 1027

YOU HAVE ENTERED WEDNESDAY, 9-NOVEMBER-1977 10:27AM,

IS THIS CORRECT (Y,N) Y

WHY RELOAD? SCH

RUN CHECKD? Y

[CHECKING FILE CONSISTENCY]

[WORKING ON STRUCTURE - PS:]

LOCAL COUNT OF FILE PAGES: 6691

LOCAL COUNT OF OVERHEAD PAGES: 2671

LOCAL COUNT OF USED PAGES: 9362

SYSTEM COUNT BEFORE CHECKD: 9362

SYSTEM COUNT AFTER CHECKD: 9362

THERE ARE NO LOST PAGES.

RUNNING DDMP

SYSJOB 3(7) STARTED AT 9-NOV-77 1027

RUN SYS:INFO

RUN SYS:MAILER

RUN SYS:QUASAR

JOB 0 /LOG OPERATOR XX OPERATOR

ENA

^ESET LOGINS ANY

^ESEND * SYSTEM IN OPERATION

PTYCON

GET SYSTEM:PTYCON.ATO

/

SJ 0:
SJ 0: INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
SJ 0: @LOG OPERATOR OPERATOR
SJ 0: JOB 1 ON TTY106 9-NOV-77 10:27:47
[FROM OPERATOR: SYSTEM IN OPERATION]

SJ 0: @ENA
SJ 0: \$^ESET LOGINS ANY
SJ 0: \$^ESEND * SYSTEM IN OPERATION
SJ 0: \$PTYCON
SJ 0: PTYCON> GET SYSTEM:PTYCON.ATO
SJ 0: PTYCON> SILENCE
SJ 0: PTYCON.LOG.1
SJ 0: PTYCON> B-START
SJ 0: PTYCON> L-START PLPT0=LPT0
SJ 0: PTYCON>
SJ 0: **** L(0) 10:28:15 ****
SJ 0: START PLPT0=LPT0
SJ 0: LPTSPL>
SJ 0: **** B(1) 10:28:17 ****
SJ 0: START
SJ 0: !
SJ 0: PTYCON> ;LPT1:L1-START PLPT1=LPT1
SJ 0: PTYCON> ;CDR:S-START PCDR0:=CDR0:
SJ 0: PTYCON> WHAT ALL
SJ 0: L(0) 4 OPERATOR LPTSPL TI 0:0:0
SJ 0: B(1) 5 OPERATOR BATCON TI 0:0:0
SJ 0: P(2) 3 OPERATOR OPLEAS RN 0:0:0
SJ 0: O(3) 2 OPERATOR EXEC TI 0:0:0

INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
@SY OPERATOR

0	DET	SYSJOB	OPERATOR
1	106	PTYCON	OPERATOR
2	112	EXEC	OPERATOR
3	111	OPLEAS	OPERATOR
4	107	LPTSPL	OPERATOR
5	110	BATCON	OPERATOR

@ATTACH (USER) OPERATOR 1
[ATTACHED TO TTY106, CONFIRM]
PASSWORD:

PTYCON>

STARTING THE SYSTEM

3.2.1 Loading from Disk Pack

Loading from disk pack is the most common way to load the system. Be sure that system power is ON, that all hardware and software have been correctly installed, and that the disk packs have been mounted properly. Also, the disk pack containing TOPS-20 and RSX-20F formatted files must be on the dual-ported drive (CONTROLLER SELECT switch points to A/B), and the drive must be unit 0 of the RH11 and RH20.

In brief, you must do the following:

1. Press the DISK and ENABLE load switches simultaneously.
2. Type the current date and time and confirm it.
3. Type the reason for reloading.
4. Type the yes or no response to the run CHECKD question.

These few steps load the front-end software, load the TOPS-20 monitor, and start the system for timesharing.

Now, a more detailed explanation of the above steps:

1. Press the upper halves of the DISK and ENABLE load switches simultaneously. The following is an example of what is then output on the CTY.

```
RSX-20F YB10-44 11:39 25-OCT-77

[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]
KLI -- VERSION YB06-07 RUNNING
KLI -- MICROCODE VERSION 202 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION:
                CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 128K  00  01  00  01   MA20   4
00400000  64K  02  03  02  03   MA20   4
KLI -- BOOTSTRAP LOADED AND STARTED
```

```
[PS MOUNTED]
```

```
SYSTEM RESTARTING, WAIT...
```

The first line of output tells you the version, 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. All lines beginning with KLI and the text between those lines contain output from KLINIT (Appendix B). The next line of text is output by TOPS-20 and means that the public file structure has been mounted. TOPS-20 then outputs the next line of text to all terminals to indicate the system is being restarted and will be available soon.

STARTING THE SYSTEM

2. The system outputs:

ENTER CURRENT DATE AND TIME:

Type the current date and time in the format dd-mmm-yy hhmm, where:

dd = day of the month

mmm = first three letters of the month

yy = last two digits of the year

hhmm = time, between 0 and 2359

You can use spaces instead of hyphens or omit the hyphens. Other date formats may be accepted, also, but they are not recommended.

The system then outputs a line telling you the day of the week, date, and time you typed, and asks you if the information is correct. You must then type Y for yes or N for no.

----- Example -----

ENTER CURRENT DATE AND TIME: 9 NOV 77 1027

YOU HAVE ENTERED WEDNESDAY, 9-NOVEMBER-1977 10:27AM,
IS THIS CORRECT (Y,N) Y

3. The system outputs:

WHY RELOAD?

Type a few words, or some abbreviations agreed upon by your system manager, that give the reason for reloading.

This answer is stored in the system error file and reported by SYSERR.

----- Example -----

WHY RELOAD? SCH

This means it's a scheduled reload.

4. The system either automatically runs CHECKD to check the file system if certain problems were previously found on the public structure, or it asks:

RUN CHECKD?

You must type Y for yes or N for no. On some regular basis, daily if you have a scheduled reload then, you should answer yes. After any disastrous hardware failure, you should answer yes. On other unscheduled reloads, however, you should usually answer no.

STARTING THE SYSTEM

CHECKD takes about four to five minutes to run for each RP04 disk pack and eight to ten minutes for each RP06 disk pack. It outputs:

```
[CHECKING FILE CONSISTENCY]
```

```
[WORKING ON STRUCTURE - PS:]
```

and performs a bit table and directory consistency check for PS:, the public structure. It then lists any problems with bad pages or files. Next, it outputs a summary of page counts and the number of lost pages. Any lost pages are allocated to the file PS:<OPERATOR>PS-LOST-PAGES.BIN.n; n is the generation number. This filename is output to inform you of the generation number. (See Section 6.7 for more information on CHECKD.)

NOTE

If CHECKD lists any problems before the summary of page counts, or if it says there are lost pages after the summary, refer to Section 6.7.1 to determine what action to take.

----- Example -----

```
RUN CHECKD? Y
[CHECKING FILE CONSISTENCY]

[WORKING ON STRUCTURE - PS:]

LOCAL COUNT OF FILE PAGES: 6691
LOCAL COUNT OF OVERHEAD PAGES: 2671
LOCAL COUNT OF USED PAGES: 9362

SYSTEM COUNT BEFORE CHECKD: 9362
SYSTEM COUNT AFTER CHECKD: 9362
```

THERE ARE NO LOST PAGES.

The system then outputs:

```
RUNNING DDMP
```

DDMP is a TOPS-20 background task that moves pages from the disk swapping area to the disk file area.

Then a message is output giving the SYSJOB version and the date and time SYSJOB started.

----- Example -----

```
SYSJOB 3(7) STARTED AT 9-NOV-77 1027
```

STARTING THE SYSTEM

The file SYSTEM:SYSJOB.RUN is then output.

----- Example -----

```
RUN SYS:INFO
RUN SYS:MAILER
RUN SYS:QUASAR
JOB 0 /LOG OPERATOR XX OPERATOR
ENA
^ESET LOGINS ANY
^ESEND * SYSTEM IN OPERATION
PTYCON
GET SYSTEM:PTYCON.ATO
/
```

Then, SYSJOB, running under job 0, outputs what was done by the job it started via JOB 0 /LOG OPERATOR. Each line of output begins with SJ 0:.

----- Example -----

```
SJ 0:
SJ 0:  INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
SJ 0: @LOG OPERATOR OPERATOR
SJ 0:  JOB 1 ON TTY106 9-NOV-77 10:27:47
[FROM OPERATOR: SYSTEM IN OPERATION]
```

```
SJ 0: @ENA
SJ 0: $^ESET LOGINS ANY
SJ 0: $^ESEND * SYSTEM IN OPERATION
SJ 0: $PTYCON
SJ 0: PTYCON> GET SYSTEM:PTYCON.ATO
SJ 0: PTYCON> SILENCE
SJ 0: PTYCON.LOG.1
SJ 0: PTYCON> B-START
SJ 0: PTYCON> L-START PLPT0=LPT0
SJ 0: PTYCON>
SJ 0: **** L(0) 10:28:15 ****
SJ 0: START PLPT0=LPT0
SJ 0: LPTSPL>
SJ 0: **** B(1) 10:28:17 ****
SJ 0: START
SJ 0: !
SJ 0: PTYCON> ;LPT1:L1-START PLPT1=LPT1
SJ 0: PTYCON> ;CDR:S-START PCDR0:=CDR0:
SJ 0: PTYCON> WHAT ALL
SJ 0: L(0)          4          OPERATOR  LPTSPL    TI        0:0:0
SJ 0: B(1)          5          OPERATOR  BATCON    TI        0:0:0
SJ 0: P(2)          3          OPERATOR  OPLEAS   RN        0:0:0
SJ 0: O(3)          2          OPERATOR  EXEC     TI        0:0:0
```

The above output from SYSJOB shows that SYSJOB processed the commands from the SYSJOB.RUN file. Because the last command from the file was GET SYSTEM:PTYCON.ATO, the output also shows the processing of that ATO file. (Refer to Section 3.4 for a discussion of the SYSJOB.RUN and PTYCON.ATO files.)

Once the PTYCON.ATO file is processed, the system is ready for timesharing. (Refer to Section 3.4.1 if you are going to have operator coverage, or to Section 3.4.2 if you are not.)

STARTING THE SYSTEM

LOADING FROM FLOPPY DISK

Sample Output

RSX-20F YB10-44 11:26 25-OCT-77

[SY0: REDIRECTED TO DX0:]

[DX0: MOUNTED]

KLI -- VERSION YB06-07 RUNNING

KLI -- MICROCODE VERSION 202 LOADED

KLI -- ALL CACHES ENABLED

LOGICAL MEMORY CONFIGURATION:

CONTROLLER

ADDRESS	SIZE	RQ0	RQ1	RQ2	RQ3	CONTYPE	INT
00000000	128K	00	01	00	01	MA20	4
00400000	64K	02	03	02	03	MA20	4

KLI -- BOOTSTRAP LOADED AND STARTED

[PS MOUNTED]

SYSTEM RESTARTING, WAIT...

ENTER CURRENT DATE AND TIME: 9 NOV 77 1032

YOU HAVE ENTERED WEDNESDAY, 9-NOVEMBER-1977 10:32AM,
IS THIS CORRECT (Y,N) Y

WHY RELOAD? SCH

RUN CHECKD? Y

[CHECKING FILE CONSISTENCY]

[WORKING ON STRUCTURE - PS:]

LOCAL COUNT OF FILE PAGES: 6692
LOCAL COUNT OF OVERHEAD PAGES: 2671
LOCAL COUNT OF USED PAGES: 9363

SYSTEM COUNT BEFORE CHECKD: 9363

SYSTEM COUNT AFTER CHECKD: 9363

THERE ARE NO LOST PAGES.

RUNNING DDMP

SYSJOB 3(7) STARTED AT 9-NOV-77 1032

RUN SYS:INFO

RUN SYS:MAILER

RUN SYS:QUASAR

JOB 0 /LOG OPERATOR XX OPERATOR

EÑA

^ESET LOGINS ANY

^ESEND * SYSTEM IN OPERATION

PTYCON

GET SYSTEM:PTYCON.ATO

/

SJ 0:
SJ 0: INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
SJ 0: @LOG OPERATOR OPERATOR
SJ 0: JOB 1 ON TTY106 9-NOV-77 10:32:46
[FROM OPERATOR: SYSTEM IN OPERATION]

SJ 0: @ENA
SJ 0: \$^ESET LOGINS ANY
SJ 0: \$^ESEND * SYSTEM IN OPERATION
SJ 0: \$PTYCON
SJ 0: PTYCON> GET SYSTEM:PTYCON.ATO
SJ 0: PTYCON> SILENCE
SJ 0: PTYCON.LOG.1
SJ 0: PTYCON> B-START
SJ 0: PTYCON> L-START PLPT0=LPT0
SJ 0: PTYCON>
SJ 0: **** L(0) 10:33:15 ****
SJ 0: START PLPT0=LPT0
SJ 0: LPTSPL>
SJ 0: **** B(1) 10:33:17 ****
SJ 0: START
SJ 0: !
SJ 0: PTYCON> ;LPT1:L1-START PLPT1=LPT1
SJ 0: PTYCON> ;CDR:S-START PCDR0:=CDR0:
SJ 0: PTYCON> WHAT ALL
SJ 0: L(0) 4 OPERATOR LPTSPL TI 0:0:0
SJ 0: B(1) 5 OPERATOR BATCON TI 0:0:0
SJ 0: P(2) 3 OPERATOR OPLEAS RN 0:0:0
SJ 0: O(3) 2 OPERATOR EXEC TI 0:0:0

INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
@SY OPERATOR

0	DET	SYSJOB	OPERATOR
1	106	PTYCON	OPERATOR
2	112	EXEC	OPERATOR
3	111	OPLEAS	OPERATOR
4	107	LPTSPL	OPERATOR
5	110	BATCON	OPERATOR

@ATTACH (USER) OPERATOR 1
[ATTACHED TO TTY106, CONFIRM]
PASSWORD:

PTYCON>

STARTING THE SYSTEM

3.2.2 Loading from Floppy Disk

Load from floppy disk if problems prevent you from loading from a disk pack, or if you need to use a particular version of software that is only on floppy disk. Be sure that system power is ON, that the proper software exists on disk packs and floppy disk (as on System Floppy A), and that the floppy disk is mounted correctly on unit 0, the left unit. Leave the floppy disk mounted while the system is running.

In brief, you must do the following:

1. Press the FLOPPY and ENABLE load switches simultaneously.
2. Type the current date and time and confirm it.
3. Type the reason for reloading.
4. Type the yes or no response to the run CHECKD question.

These few steps load the front-end software, load the TOPS-20 monitor, and start the system for timesharing.

Now, a more detailed explanation of the above steps:

1. Press the upper halves of the FLOPPY and ENABLE load switches simultaneously. The following is an example of what is then output on the CTY.

```
RSX-20F YB10-44 11:26 25-OCT-77

[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB06-07 RUNNING
KLI -- MICROCODE VERSION 202 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION:
      CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 128K  00  01  00  01   MA20   4
00400000  64K  02  03  02  03   MA20   4
KLI -- BOOTSTRAP LOADED AND STARTED

[PS MOUNTED]

SYSTEM RESTARTING, WAIT...
```

The first line of output tells you the version, creation time, and date of the RSX-20F monitor for the front end. The next two lines tell you that DX0: (the floppy disk on unit 0) is the system device (SY0:) for the front-end tasks. All lines beginning with KLI and the text between those lines contain output from KLINIT (Appendix B). The next line of text is output by TOPS-20 and means that the public file structure has been mounted. TOPS-20 then outputs the next line of text to all terminals to indicate the system is being restarted and will be available soon.

STARTING THE SYSTEM

2. The system outputs:

ENTER CURRENT DATE AND TIME:

Type the current date and time in the format dd-mmm-yy hhmm, where:

dd = day of the month

mmm = first three letters of the month

yy = last two digits of the year

hhmm = time, between 0 and 2359

You can use spaces instead of hyphens or omit the hyphens. Other date formats may be accepted, also, but they are not recommended.

The system then outputs a line telling you the day of the week, date, and time you typed, and asks you if the information is correct. You must then type Y for yes or N for no.

----- Example -----

ENTER CURRENT DATE AND TIME: 9 NOV 77 1032

YOU HAVE ENTERED WEDNESDAY, 9-NOVEMBER-1977 10:32AM,
IS THIS CORRECT (Y,N) Y

3. The system outputs:

WHY RELOAD?

Type a few words, or some abbreviations agreed upon by your system manager, that give the reason for reloading.

This answer is stored in the system error file and reported by SYSERR.

----- Example -----

WHY RELOAD? SCH

This means it's a scheduled reload.

4. The system either automatically runs CHECKD to check the file system if certain problems were previously found on the public structure, or it asks:

RUN CHECKD?

You must type Y for yes or N for no. On some regular basis, daily if you have a scheduled reload then, you should answer yes. After any disastrous hardware failure, you should answer yes. On other unscheduled reloads, however, you should usually answer no.

STARTING THE SYSTEM

CHECKD takes about four to five minutes to run for each RP04 disk pack and eight to ten minutes for each RP06 disk pack. It outputs:

```
[CHECKING FILE CONSISTENCY]
```

```
[WORKING ON STRUCTURE - PS:]
```

and performs a bit table and directory consistency check for PS:, the public structure. It then lists any problems with bad pages or files. Next, it outputs a summary of page counts and the number of lost pages. Any lost pages are allocated to the file PS:<OPERATOR>PS-LOST-PAGES.BIN.n; n is the generation number. This filename is output to inform you of the generation number. (See Section 6.7 for more information on CHECKD.)

NOTE

If CHECKD lists any problems before the summary of page counts, or if it says there are lost pages after the summary, refer to Section 6.7.1 to determine what action to take.

----- Example -----

```
RUN CHECKD? Y
[CHECKING FILE CONSISTENCY]

[WORKING ON STRUCTURE - PS:]

LOCAL COUNT OF FILE PAGES: 6692
LOCAL COUNT OF OVERHEAD PAGES: 2671
LOCAL COUNT OF USED PAGES: 9363
```

```
SYSTEM COUNT BEFORE CHECKD: 9363
SYSTEM COUNT AFTER CHECKD: 9363
```

```
THERE ARE NO LOST PAGES.
```

The system then outputs:

```
RUNNING DDMP
```

DDMP is a TOPS-20 background task that moves pages from the disk swapping area to the disk file area.

Then a message is output giving the SYSJOB version and the date and time SYSJOB started.

----- Example -----

```
SYSJOB 3(7) STARTED AT 9-NOV-77 1032
```

STARTING THE SYSTEM

The file SYSTEM:SYSJOB.RUN is then output.

----- Example -----

```
RUN SYS:INFO
RUN SYS:MAILER
RUN SYS:QUASAR
JOB 0 /LOG OPERATOR XX OPERATOR
ENA
^ESET LOGINS ANY
^ESEND * SYSTEM IN OPERATION
PTYCON
GET SYSTEM:PTYCON.ATO
/
```

Then, SYSJOB, running under job 0, outputs what was done by the job it started via JOB 0 /LOG OPERATOR. Each line of output begins with SJ 0:.

----- Example -----

```
SJ 0:
SJ 0:  INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
SJ 0: @LOG OPERATOR OPERATOR
SJ 0:  JOB 1 ON TTY106 9-NOV-77 10:32:46
[FROM OPERATOR: SYSTEM IN OPERATION]

SJ 0: @ENA
SJ 0: $^ESET LOGINS ANY
SJ 0: $^ESEND * SYSTEM IN OPERATION
SJ 0: $PTYCON
SJ 0: PTYCON> GET SYSTEM:PTYCON.ATO
SJ 0: PTYCON> SILENCE
SJ 0: PTYCON.LOG.1
SJ 0: PTYCON> B-START
SJ 0: PTYCON> L-START PLPT0=LPT0
SJ 0: PTYCON>
SJ 0: **** L(0) 10:33:15 ****
SJ 0: START PLPT0=LPT0
SJ 0: LPTSPL>
SJ 0: **** B(1) 10:33:17 ****
SJ 0: START
SJ 0: !
SJ 0: PTYCON> ;LPT1:L1-START PLPT1=LPT1
SJ 0: PTYCON> ;CDR:S-START PCDR0:=CDR0:
SJ 0: PTYCON> WHAT ALL
SJ 0: L(0)          4      OPERATOR  LPTSPL    TI      0:0:0
SJ 0: B(1)          5      OPERATOR  BATCON    TI      0:0:0
SJ 0: P(2)          3      OPERATOR  OPLEAS    RN      0:0:0
SJ 0: O(3)          2      OPERATOR  EXEC      TI      0:0:0
```

The above output from SYSJOB shows that SYSJOB processed the commands from the SYSJOB.RUN file. Because the last command from the file was GET SYSTEM:PTYCON.ATO, the output also shows the processing of that ATO file. (Refer to Section 3.4 for a discussion of the SYSJOB.RUN and PTYCON.ATO files.)

Once the PTYCON.ATO file is processed, the system is ready for timesharing. (Refer to Section 3.4.1 if you are going to have operator coverage, or to Section 3.4.2 if you are not.)

STARTING THE SYSTEM

LOADING VIA THE SWITCH REGISTER
(bits 0, 1, 2, and 7 set)

Sample Output

RSX-20F YB10-44 11:39 25-OCT-77

```
[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]
KLI -- VERSION YB06-07 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>YES
KLI -- MICROCODE VERSION 202 LOADED
KLI -- RECONFIGURE CACHE [FILE,ALL,YES,NO]?
KLI>ALL
KLI -- ALL CACHES ENABLED
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI>ALL
LOGICAL MEMORY CONFIGURATION:
      CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 128K  00  01  00  01    MA20    4
00400000 128K  02  03  02  03    MA20    4
KLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
KLI>YES
KLI -- CONFIGURATION FILE ALTERED
KLI -- BOOTSTRAP LOADED AND STARTED
```

BOOT>

[PS MOUNTED]

SYSTEM RESTARTING, WAIT...

ENTER CURRENT DATE AND TIME: 9 NOV 77 1057

YOU HAVE ENTERED WEDNESDAY, 9-NOVEMBER-1977 10:57AM,

IS THIS CORRECT (Y,N) Y

WHY RELOAD? SCH

RUN CHECKD? N

RUNNING DDMP

SYSJOB 3(7) STARTED AT 9-NOV-77 1057

RUN SYS:INFO

RUN SYS:MAILER

RUN SYS:QUASAR

JOB 0 /LOG OPERATOR XX OPERATOR

ENA

^ESET LOGINS ANY

^ESEND * SYSTEM IN OPERATION

PTYCON

GET SYSTEM:PTYCON.ATO

/

SJ 0:
SJ 0: INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
SJ 0: @LOG OPERATOR OPERATOR
SJ 0: JOB 1 ON TTY106 9-NOV-77 10:57:18
[FROM OPERATOR: SYSTEM IN OPERATION]

SJ 0: @ENA
SJ 0: \$^ESET LOGINS ANY
SJ 0: \$^ESEND * SYSTEM IN OPERATION
SJ 0: \$PTYCON
SJ 0: PTYCON> GET SYSTEM:PTYCON.ATO
SJ 0: PTYCON> SILENCE
SJ 0: PTYCON.LOG.1
SJ 0: PTYCON> B-START
SJ 0: PTYCON> L-START PLPT0=LPT0
SJ 0: PTYCON>
SJ 0: **** L(0) 10:57:48 ****
SJ 0: START PLPT0=LPT0
SJ 0: LPTSPL>
SJ 0: **** B(1) 10:57:50 ****
SJ 0: START
SJ 0: !
SJ 0: PTYCON> ;LPT1:L1-START PLPT1=LPT1
SJ 0: PTYCON> ;CDR:S-START PCDR0:=CDR0:
SJ 0: PTYCON> WHAT ALL
SJ 0: L(0) 4 OPERATOR LPTSPL TI 0:0:0
SJ 0: B(1) 5 OPERATOR BATCON TI 0:0:0
SJ 0: P(2) 3 OPERATOR OPLEAS RN 0:0:0
SJ 0: O(3) 2 OPERATOR EXEC TI 0:0:0

INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
@SY OPERATOR

0 DET SYSJOB OPERATOR
1 106 PTYCON OPERATOR
2 112 EXEC OPERATOR
3 111 OPLEAS OPERATOR
4 107 LPTSPL OPERATOR
5 110 BATCON OPERATOR

@ATTACH (USER) OPERATOR 1
[ATTACHED TO TTY106, CONFIRM]
PASSWORD:

PTYCON>

STARTING THE SYSTEM

3.2.3 Loading via the Switch Register

Load the system via the switch register if you have to do any of the following:

1. Configure cache or memory yourself, because you cannot use the default configuration.
2. Load a bootstrap with a name other than BOOT.EXB; for example, MTBOOT.EXB, which loads a monitor from magnetic tape.
3. Load a TOPS-20 monitor other than PS:<SYSTEM>MONITR.EXE; for example, a monitor on magnetic tape or a monitor with a different name on disk.
4. Load from a disk pack or floppy disk that is not unit 0.
5. Dump the TOPS-20 monitor after a crash.

You must use a floppy disk or a disk pack to get the software for the front end. If you are going to use a disk pack, it must contain the appropriate software and be mounted on the dual-ported drive (CONTROLLER SELECT switch points to A/B). If a floppy disk is going to be used, you must have the appropriate floppy disk mounted (System Floppy A).

In brief, you must do the following:

1. Set the proper switches (or bits) in the switch register. Usually, you want to set switches 0, 1, and 2 to enter the KL initialization dialog. If you are going to use a disk pack on unit 0 to get the front-end software, also set switch 7.
2. Press the load switches SW REG and ENABLE simultaneously.
3. Answer the questions to the KL initialization operator dialog (Appendix B).
4. Type the current date and time and confirm it.
5. Type the reason for reloading.
6. Type the yes or no response to the run CHECKD question.

These steps load the front-end software, load the TOPS-20 monitor, and start the system for timesharing.

Now, a more detailed explanation of the above steps:

1. Set the appropriate switches (or bits) in the switch register by raising them. The bits and the meaning for those now used are listed in Table 3-1.

STARTING THE SYSTEM

Table 3-1
Switch Register Bit Definitions

Switch Register												
17	16	15	14	11	10	8	7	6	3	2	1	0
Bit	Meaning											
0	If this is set, the remaining bits are interpreted. You must set this to load via the switch register.											
2,1	<p>If both are set, the KL initialization operator dialog (KLINIT) is loaded and started.</p> <p>If either one is set, only the front-end monitor, RSX-20F, is started; there is no communication between the KL and console front-end processors.</p> <p>If neither is set, the system is loaded much like it is via the DISK or FLOPPY load switch. However, because other bits are interpreted, you can specify the unit number of the bootstrap device in bits 8-10. The default path is taken by KLINIT until the bootstrap prompts with BOOT>. Then, you can specify a monitor other than the default, which is PS:<SYSTEM>MONITR.EXE, or give a switch, e.g., /D to dump KL memory.</p>											
6-3	Currently not used and must not be set.											
7	<p>If this is set, the bootstrap device is a disk pack on a dual-ported drive. Front-end files on a disk pack will be used for system loading.</p> <p>If this is not set, the bootstrap device is a floppy disk. Front-end files on a floppy disk will be used for system loading.</p>											
10-8	These three bits allow you to specify in binary the unit number of the bootstrap device (0 to 7). For example, no bits set indicate unit 0; bit 8 set indicates unit 1.											
14-11	Currently not used and must not be set.											
15	This indicates what is done when an I/O error occurs during bootstrapping. When this is set, the operation is retried indefinitely if an error occurs. When this is not set, the normal case, a halt occurs after ten unsuccessful retries.											
17,16	Not used and must not be set.											

STARTING THE SYSTEM

2. Press the upper halves of the SW REG and ENABLE load switches simultaneously.

----- Example -----

The following is an example of what is then output on the CTY when bits 0, 1, and 2 are set, i.e., 7 is entered in the switch register.

```
RSX-20F YB10-44 11:26 25-OCT-77

[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB06-07 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>
```

The first line of output tells you the version, creation time, and date of the RSX-20F monitor for the front end. The next two lines tell you that DX0: (the floppy disk on unit 0) is the system device (SY0:) for the front-end tasks. If bit 7 had been set, the DX0: would have been DB0: for a disk pack. If any of bits 8-10 had been set, the unit number would have been something other than 0.

The lines beginning with KLI are output by KLINIT, the KL initialization operator dialog. If you are unfamiliar with that dialog, first see Appendix B for the details of KLINIT. Then go to step 3 in this section (3.2.3).

----- Example -----

The following is an example of the CTY output when bit 0 is set with bits 1 and 2 not set. Bits 7, 8, and 9 have been set to specify a different bootstrap device and unit.

```
RSX-20F YB10-44 11:39 25-OCT-77

[SY0: REDIRECTED TO DB3:]
[DB3: MOUNTED]
KLI -- VERSION YB06-07 RUNNING
KLI -- MICROCODE VERSION 202 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION:
      CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 128K  00  01  00  01    MA20    4
00400000 128K  02  03  02  03    MA20    4
KLI -- BOOTSTRAP LOADED AND STARTED

BOOT>
```

All lines beginning with KLI and the text between those lines contain output from KLINIT (Appendix B). In this case KLINIT took the default path up to and including the loading and starting of the KL bootstrap. Then, however, instead of loading the default monitor, PS:<SYSTEM>MONITR.EXE, the bootstrap prompts with BOOT> and lets you type in the name of the monitor that you want to load. For example,

```
BOOT><SUBSYS>TEST01.EXE
```

You could also press RETURN after BOOT> to get the default monitor.

STARTING THE SYSTEM

Once you specify the monitor, it is loaded and started and outputs:

```
[PS MOUNTED]
```

```
SYSTEM RESTARTING, WAIT...
```

The first line means that the public file structure has been mounted. The next line of text is output to all terminals to indicate the system is being restarted and will be available soon.

Because the bit settings in the latter example cause much of the dialog to take a default path, continue reading at step 4 for that example. For the former example, continue at step 3.

3. After the output:

```
CLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?  
CLI>
```

you are in the KL initialization operator dialog, also called KLINIT, and you must answer the questions asked. Answer them with the knowledge you gained from Appendix B, or simply follow Appendix B.

Once the KL bootstrap has been loaded and started via KLINIT, and you have responded successfully to the BOOT> prompt, the TOPS-20 monitor outputs:

```
[PS MOUNTED]
```

```
SYSTEM RESTARTING, WAIT...
```

The first line means that the public file structure has been mounted. The next line of text is output to all terminals to indicate the system is being restarted and will be available soon.

4. The system outputs:

```
ENTER CURRENT DATE AND TIME:
```

Type the current date and time in the format dd-mmm-yy hhmm, where:

dd = day of the month

mmm = first three letters of the month

yy = last two digits of the year

hhmm = time, between 0 and 2359

You can use spaces instead of hyphens or omit the hyphens. Other date formats may be accepted, also, but they are not recommended.

The system then outputs a line telling you the day of the week, date, and time you typed, and asks you if the information is correct. You must then type Y for yes or N for no.

STARTING THE SYSTEM

----- Example -----

ENTER CURRENT DATE AND TIME: 9 NOV 77 1057

YOU HAVE ENTERED WEDNESDAY, 9-NOVEMBER-1977 10:57AM,
IS THIS CORRECT (Y,N) Y

5. The system outputs:

WHY RELOAD?

Type a few words, or some abbreviations agreed upon by your system manager, that give the reason for reloading.

This answer is stored in the system error file and reported by SYSERR.

----- Example -----

WHY RELOAD? SCH

This means it's a scheduled reload.

6. The system either automatically runs CHECKD to check the file system if certain problems were previously found on the public structure, or it asks:

RUN CHECKD?

You must type Y for yes or N for no. On some regular basis, daily if you have a scheduled reload then, you should answer yes. After any disastrous hardware failure, you should answer yes. On other unscheduled reloads, however, you should usually answer no.

CHECKD takes about four to five minutes to run for each RP04 disk pack and eight to ten minutes for each RP06 disk pack. It outputs:

[CHECKING FILE CONSISTENCY]

[WORKING ON STRUCTURE - PS:]

and performs a bit table and directory consistency check for PS:, the public structure. It then lists any problems with bad pages or files. Next, it outputs a summary of page counts and the number of lost pages. Any lost pages are allocated to the file PS:<OPERATOR>PS-LOST-PAGES.BIN.n; n is the generation number. This filename is output to inform you of the generation number. (See Section 6.7 for more information on CHECKD.)

NOTE

If CHECKD lists any problems before the summary of page counts, or if it says there are lost pages after the summary, refer to Section 6.7.1 to determine what action to take.

STARTING THE SYSTEM

----- Example -----

```
RUN CHECKD? Y
[CHECKING FILE CONSISTENCY]

[WORKING ON STRUCTURE - PS:]
```

```
LOCAL COUNT OF FILE PAGES: 6692
LOCAL COUNT OF OVERHEAD PAGES: 2671
LOCAL COUNT OF USED PAGES: 9363
```

```
SYSTEM COUNT BEFORE CHECKD: 9363
SYSTEM COUNT AFTER CHECKD: 9363
```

THERE ARE NO LOST PAGES.

The system then outputs:

```
RUNNING DDMP
```

DDMP is a TOPS-20 background task that moves pages from the disk swapping area to the disk file area.

Then a message is output giving the SYSJOB version and the date and time SYSJOB started.

----- Example -----

```
SYSJOB 3(7) STARTED AT 9-NOV-77 1057
```

The file SYSTEM:SYSJOB.RUN is then output.

----- Example -----

```
RUN SYS:INFO
RUN SYS:MAILER
RUN SYS:QUASAR
JOB 0 /LOG OPERATOR XX OPERATOR
ENA
^ESET LOGINS ANY
^ESEND * SYSTEM IN OPERATION
PTYCON
GET SYSTEM:PTYCON.ATO
/
```

STARTING THE SYSTEM

Then, SYSJOB, running under job 0, outputs what was done by the job it started via JOB 0 /LOG OPERATOR. Each line of output begins with SJ 0:.

----- Example -----

```
SJ 0:
SJ 0:  INSTALLATION-TEST SYSTEM, TOPS-20 MONITOR 3(1360)
SJ 0:  @LOG OPERATOR OPERATOR
SJ 0:  JOB 1 ON TTY106 9-NOV-77 10:57:18
[FROM OPERATOR: SYSTEM IN OPERATION]

SJ 0:  @ENA
SJ 0:  $^ESET LOGINS ANY
SJ 0:  $^ESEND * SYSTEM IN OPERATION
SJ 0:  $PTYCON
SJ 0:  PTYCON> GET SYSTEM:PTYCON.ATO
SJ 0:  PTYCON> SILENCE
SJ 0:  PTYCON.LOG.1
SJ 0:  PTYCON> B-START
SJ 0:  PTYCON> L-START PLPT0=LPT0
SJ 0:  PTYCON>
SJ 0:  **** L(0) 10:57:48 ****
SJ 0:  START PLPT0=LPT0
SJ 0:  LPTSPL>
SJ 0:  **** B(1) 10:57:50 ****
SJ 0:  START
SJ 0:  !
SJ 0:  PTYCON> ;LPT1:L1-START PLPT1=LPT1
SJ 0:  PTYCON> ;CDR:S-START PCDR0:=CDR0:
SJ 0:  PTYCON> WHAT ALL
SJ 0:  L(0)          4      OPERATOR   LPTSPL    TI        0:0:0
SJ 0:  B(1)          5      OPERATOR   BATCON    TI        0:0:0
SJ 0:  P(2)          3      OPERATOR   OPLEAS   RN        0:0:0
SJ 0:  O(3)          2      OPERATOR   EXEC     TI        0:0:0
```

The above output from SYSJOB shows that SYSJOB processed the commands from the SYSJOB.RUN file. Because the last command from the file was GET SYSTEM:PTYCON.ATO, the output also shows the processing of that ATO file. (Refer to Section 3.4 for a discussion of the SYSJOB.RUN and PTYCON.ATO files.)

Once the PTYCON.ATO file is processed, the system is ready for timesharing. (Refer to Section 3.4.1 if you are going to have operator coverage, or to Section 3.4.2 if you are not.)

STARTING THE SYSTEM

3.3 LOADING THE TOPS-20 MONITOR

The TOPS-20 monitor is actually loaded during the procedure for loading the system, which was discussed in the three previous sections. The next two sections give more information on loading the TOPS-20 monitor to emphasize where the monitor can be.

3.3.1 Loading TOPS-20 from a Disk Pack with BOOT

When you load the system using the DISK or FLOPPY load switch, TOPS-20 is loaded and started from PS:<SYSTEM>MONITR.EXE.

When you load the system via the switch register, the bootstrap prompts, so you can either press RETURN for the default monitor, PS:<SYSTEM>MONITR.EXE, or type a file specification for a different monitor. If you omit a field in the file specification, that field is defaulted to what it is in the default monitor.

----- Example -----

```
BOOT><TESTSY>MON002.EXE
```

If you had set bits 1 and 2 in the switch register and received the KLINIT question:

```
CLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
```

you could also specify a bootstrap other than the default, BOOT.EXB. However, the file you specify must reside on the bootstrap device.

----- Example -----

In this example the KL bootstrap is VBORP4.EXB and the TOPS-20 monitor is PS:<SYSTEM>MON002.EXE.

```
CLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
```

```
CLI>VBORP4
```

```
CLI -- BOOTSTRAP LOADED AND STARTED
```

```
BOOT><SYSTEM>MON002.EXE
```

----- Hint -----

Entering the KLINIT dialog to get the question LOAD KL BOOTSTRAP or to get the BOOT> prompt is useful for testing new bootstraps or new TOPS-20 monitors.

3.3.2 Loading TOPS-20 from Magnetic Tape with MTBOOT

If for some reason you need to load a TOPS-20 monitor from magnetic tape, do the following:

1. Mount the magnetic tape containing the monitor on drive 0.
2. Load the system via the switch register with at least bits 0, 1, and 2 set.
3. Enter the KLINIT dialog.

STARTING THE SYSTEM

4. After LOAD KL BOOTSTRAP, type MTBOOT.
5. After BOOT>, type MT: and press RETURN to load and start the monitor on the magnetic tape.

----- Example -----

```
KLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
KLI>MTBOOT
KLI -- BOOTSTRAP LOADED AND STARTED
```

```
BOOT>MT:
```

----- Hint -----

If you cannot use drive 0 for step 1, mount the magnetic tape on any available drive, but be sure to put all other drives OFFLINE.

3.4 READING THE SYSTEM FOR TIMESHARING

As you saw in previous sections, once RSX-20F and TOPS-20 are loaded and started, SYSJOB starts running under job 0. SYSJOB then reads and outputs on the CTY the file <SYSTEM>SYSJOB.RUN and then performs the commands in that file. These commands start certain programs and issue some commands which aid you and the system in providing an efficient timesharing facility.

To see what commands SYSJOB actually performs, look at the file PS:<SYSTEM>SYSJOB.RUN. The one that is distributed follows.

```
RUN SYS:INFO
RUN SYS:MAILER
RUN SYS:QUASAR
JOB 0 /LOG OPERATOR XX OPERATOR
ENA
^ESET LOGINS ANY
^ESEND * SYSTEM IN OPERATION
PTYCON
GET SYSTEM:PTYCON.ATO
/
```

This file causes SYSJOB to:

1. Run INFO, a program that handles message identifications for the MAIL program and batch system.
2. Run MAILER, a program that handles messages sent via MAIL.
3. Run QUASAR, a program that handles the system queues for batch jobs and print requests.
4. Create a job on the system and log it in under OPERATOR. All text between / and / is passed to the job. Any input and output for the job is printed on the CTY and preceded by SJ 0: until you attach to that job (Section 3.4.1). SYSJOB identifies the job with 0, but 0 is not the system job number for that job. Section 3.4.1 tells you how to find the system job number for this job. The last example in Sections 3.2.1, 3.2.2, and 3.2.3 shows input and output for this job.

(See Appendix A under ^ESPEAK for details on SYSJOB commands. Remember that <SYSTEM>SYSJOB.RUN must contain SYSJOB commands.)

STARTING THE SYSTEM

The SYSJOB.RUN file makes the job under OPERATOR do the following:

1. Enables capabilities. This enables the OPERATOR capability, normally granted to the OPERATOR directory.
2. Does a ^ESET LOGINS ANY to allow LOGINS from all terminals.
3. Does a ^ESEND to send the message SYSTEM IN OPERATION followed by a bell to all terminals.
4. Runs PTYCON.
5. Starts various programs under PTYCON by using the file SYSTEM:PTYCON.ATO. The distributed PTYCON.ATO file with comments added follows. Note that ESCAPE in this file has to be typed as up-arrow dollar sign (^\$).

```

SILENCE                !silence output to CTY
LOG                    !create LOG file PTYCON.LOG
DEFINE ^$L             !define subjob 0 as L
;LPT1:DEFINE ^$L1      !for a second printer
DEFINE ^$B             !define subjob 1 as B
DEFINE ^$P             !define subjob 2 as P
;CDR:DEFINE ^$S        !for a card reader
DEFINE ^$O             !define subjob 3 as O
CONN O                 !connect to subjob O
LOG OPERATOR FOO OPERATOR !log in
^X                     !return to PTYCON
O-ENABLE               !enable capabilities
O-RUN SYSTEM:CHECKD    !run CHECKD under O
O-CHECK DIRECTORY     !use CHECK DIRECTORY command
O-EXIT                !exit from CHECKD
O-DISABLE              !disable capabilities
CONN P                 !connect to subjob P
LOG OPERATOR FOO OPERATOR !log in
ENABLE                 !enable capabilities
OPLEAS                 !run OPLEAS
^X                     !return to PTYCON
P-                     !don't require an id
CONN L                 !connect to subjob L
LOG OPERATOR FOO OPERATOR !log in
ENA                    !enable capabilities
LPTSPL                 !run LPTSPL
^X                     !return to PTYCON
;LPT1:CONN L1          !connect to subjob L1
;LPT1:LOG OPERATOR FOO OPERATOR !log in
;LPT1:ENA              !enable capabilities
;LPT1:LPTSPL           !run LPTSPL
;LPT1:^X               !return to PTYCON
CONN B                 !connect to subjob B
LOG OPERATOR FOO OPERATOR !log in
ENA                    !enable capabilities
BATCON                 !run BATCON
^X                     !return to PTYCON
;CDR:CONNECT S         !connect to subjob S
;CDR:LOGIN OPERATOR FOO OPERATOR !log in
:CDR:ENABLE            !enable capabilities
;CDR:SPRINT            !run SPRINT
;CDR:^X                !return to PTYCON
NO SILENCE             !allow output to CTY
B-START                !start BATCON
L-START PLPT0=LPT0     !start LPTSPL
;LPT1:L1-START PLPT1=LPT1 !start second LPTSPL
;CDR:S-START PCDR0:=CDR0 !start SPRINT
WHAT ALL               !print status of all subjobs

```

STARTING THE SYSTEM

The PTYCON.ATO file then causes PTYCON to do the following:

1. Silence output to the CTY from PTYCON until PTYCON processes a NO SILENCE command. This eliminates unnecessary output. Therefore, you do not see many of the following PTYCON actions output on the CTY. An example of what you do see is shown in the last example of Sections 3.2.1, 3.2.2, 3.2.3, and 4.1.1, beginning with SJ 0: \$PTYCON.
2. Create a LOG file PTYCON.LOG under <OPERATOR>. This contains a record of everything that happens under PTYCON.
3. Define subjob 0 as L, subjob 1 as B, subjob 2 as P, and subjob 3 as O. If your system has two line printers or a card reader, subjobs Ll or S, will also be defined. (See the DECSYSTEM-20 Software Installation Guide on editing PTYCON.ATO for a second line printer or a card reader.)
4. Connect to subjob 0 and log it in under OPERATOR. A fictitious password of FOO is acceptable in this case, because the job running PTYCON is already logged in under OPERATOR.
5. Return to PTYCON command level with CTRL/X.
6. Under the subjob 0, enable capabilities and run CHECKD with the CHECK DIRECTORY function, which rebuilds directory symbol tables and recomputes disk usage for directories needing such action. Then exit from CHECKD and disable capabilities.
7. Connect to subjob P, log it in under OPERATOR, enable capabilities, and run OPLEAS under it to handle PLEASE, SMOUNT, SREMOVE, and TMOUNT commands.
8. Return to PTYCON command level with CTRL/X.
9. Send a RETURN to OPLEAS, so PLEASE commands will not require an operator id.
10. Connect to subjob L, log it in under OPERATOR, enable capabilities, and run LPTSPL to handle requests to output to the line printer.
11. Return to PTYCON command level with CTRL/X.
12. If your system has a second line printer, PTYCON will then connect to subjob Ll, log it in under OPERATOR, enable capabilities, run LPTSPL to handle requests to output to the line printer, and return to PTYCON command level.
13. Connect to subjob B, log it in under OPERATOR, enable capabilities, and run BATCON to handle batch jobs.
14. Return to PTYCON command level with CTRL/X.
15. If your system has a card reader, PTYCON will then connect to subjob S, log it in under OPERATOR, enable capabilities, run SPRINT to read card decks, and return to PTYCON command level.
16. Resume output from PTYCON to the CTY (the NO SILENCE command).

STARTING THE SYSTEM

17. Start BATCON running under B.
18. Start LPTSPL running under L.
19. If there is a second line printer, start LPTSPL under L1; if there is a card reader, start SPRINT under S.
20. Print the status of all subjobs (WHAT ALL). Because PTYCON continues processing PTYCON commands while it passes off commands to subjobs, the WHAT ALL output may appear before the subjobs have finished processing their commands.

NOTE

See Chapter 4 for details on PTYCON.

When output to the CTY has stopped, the system is ready for timesharing. The front-end and TOPS-20 monitors are running, SYSJOB and the programs under its processes are running, an OPERATOR job is running PTYCON, and PTYCON's subjobs are running.

However, the CTY is not attached to any of these jobs. If you are going to have operator coverage, you should attach to the OPERATOR job running PTYCON (Section 3.4.1). Otherwise, you should set up the system for no operator coverage (Section 3.4.2).

WARNING

Whenever CTRL/\ (control backslash) is typed at the CTY, the console processor command language is entered (Appendix C). To get out of it, type QUIT or CTRL/Z.

If your system manager wants SYSJOB or PTYCON to perform functions other than those above, you can edit the SYSTEM:SYSJOB.RUN file or edit the SYSTEM:PTYCON.ATO file to reflect what is needed. Remember that SYSJOB commands, documented under ^ESPEAK in Appendix A, must be used in the SYSJOB.RUN file. Instructions for editing the PTYCON.ATO file for supporting a second line printer or a card reader are in the DECSYSTEM-20 Software Installation Guide.

To mount a structure that your system will always have on-line in addition to PS:, the public structure, add the following to the end of PTYCON.ATO.

```
O-SMOUNT structure,  
O-CANCEL  
O-
```

The CANCEL subcommand to SMOUNT causes the structure to be mounted if it's on-line. However, if it is not on-line, the command exits without causing an OPLEAS request to mount it.

STARTING THE SYSTEM

3.4.1 Timesharing with Operator Coverage

If you are going to have operator coverage, you should attach to the PTYCON job as soon as PTYCON has processed the PTYCON.ATO file. Then you can quickly respond to PTYCON subjobs.

Do the following:

1. Type CTRL/C to get the system identification message.
2. Type SYS OPERATOR and press RETURN to get a SYSTAT of all jobs logged in under OPERATOR. Check to see which job is running PTYCON.
3. Type ATTACH OPERATOR n, where n is the job number for the OPERATOR job running PTYCON, and press RETURN.
4. After the message [ATTACHED TO TTYn, CONFIRM], press RETURN to continue with the ATTACH. However, if you get the wrong job, type CTRL/C and start at step 3 again.
5. After PASSWORD: type the operator's password and press RETURN. For security, it will not be output as you type.
6. Press RETURN again to get the prompt PTYCON>. Then you can give PTYCON commands (Chapter 4).
7. Type:

```
PUSH
ENABLE
^ESET OPERATOR-IN-ATTENDANCE
POP
```

----- Example -----

```
DEVELOPMENT SYSTEM, TOPS-20 MONITOR 3(1241)
@SYS OPERATOR
```

```
0 DET SYSJOB OPERATOR
1 102 PTYCON OPERATOR
3 106 EXEC OPERATOR
4 105 OPLEAS OPERATOR
5 103 LPTSPL OPERATOR
6 104 BATCON OPERATOR
```

```
@ATTACH OPERATOR 1
[ATTACHED TO TTY102, CONFIRM] (RET)
PASSWORD: (RET)
PTYCON> PUSH
```

```
TOPS-20 COMMAND PROCESSOR 3(400)
@ENABLE
$^ESET OPERATOR-IN-ATTENDANCE
$POP
PTYCON>
```

Once you attach to the job running PTYCON, output from PTYCON does not have to be handled by SYSJOB. It comes directly from PTYCON.

STARTING THE SYSTEM

3.4.2 Timesharing without Operator Coverage

To continue timesharing, but without operator coverage, do the following:

1. Attach to the OPERATOR job running PTYCON, if you haven't already attached to it (Section 3.4.1).
2. Type PUSH after the PTYCON prompt.
3. Type ENABLE.
4. Type ^ESEND * NO OPERATOR COVERAGE AFTER time.
5. Type POP.

Just before you end operator coverage, type to PTYCON:

1. PUSH
2. ENABLE
3. ^ESET NO OPERATOR

NOTE

In the following three steps, the ^C has to be typed as up-arrow C, not CTRL/C, and the ^E and ^Z must be typed as CTRL/E and CTRL/Z.

4. ^ESPEAK
JOB 0/
^C
/^Z
5. ^ESPEAK
JOB 0/
ATTACH OPERATOR n
Ⓡ
POP
Ⓡ
/^Z

In step 5, n is the job number of the OPERATOR job running PTYCON.

After you type the above, the commands given to ^ESPEAK are output on the CTY. Then the actual processing of the commands is indicated by output preceded by SJ 0:. The CTY is then not attached to any job. If any messages are output by PTYCON subjobs, they are printed on the CTY preceded by SJ 0:.

----- Hint -----

The ^E commands are documented in detail in Appendix A.

STARTING THE SYSTEM

----- Example -----

```
PTYCON> PUSH
  TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE
$^ESET NO OPERATOR-IN-ATTENDANCE
$^ESPEAK
  [PLEASE TYPE SYSJOB COMMANDS - END WITH ^Z]
JOB 0/
^C
/^Z
$JOB 0/
^C
/
SJ 0: PTYCON>
SJ 0: 2102 DEVELOPMENT SYS., TOPS-20 MONITOR 3(1271)
SJ 0: @
SJ 0: @^C
SJ 0: @
^ESPEAK
  [PLEASE TYPE SYSJOB COMMANDS - END WITH ^Z]
JOB 0/
ATTACH OPERATOR 1

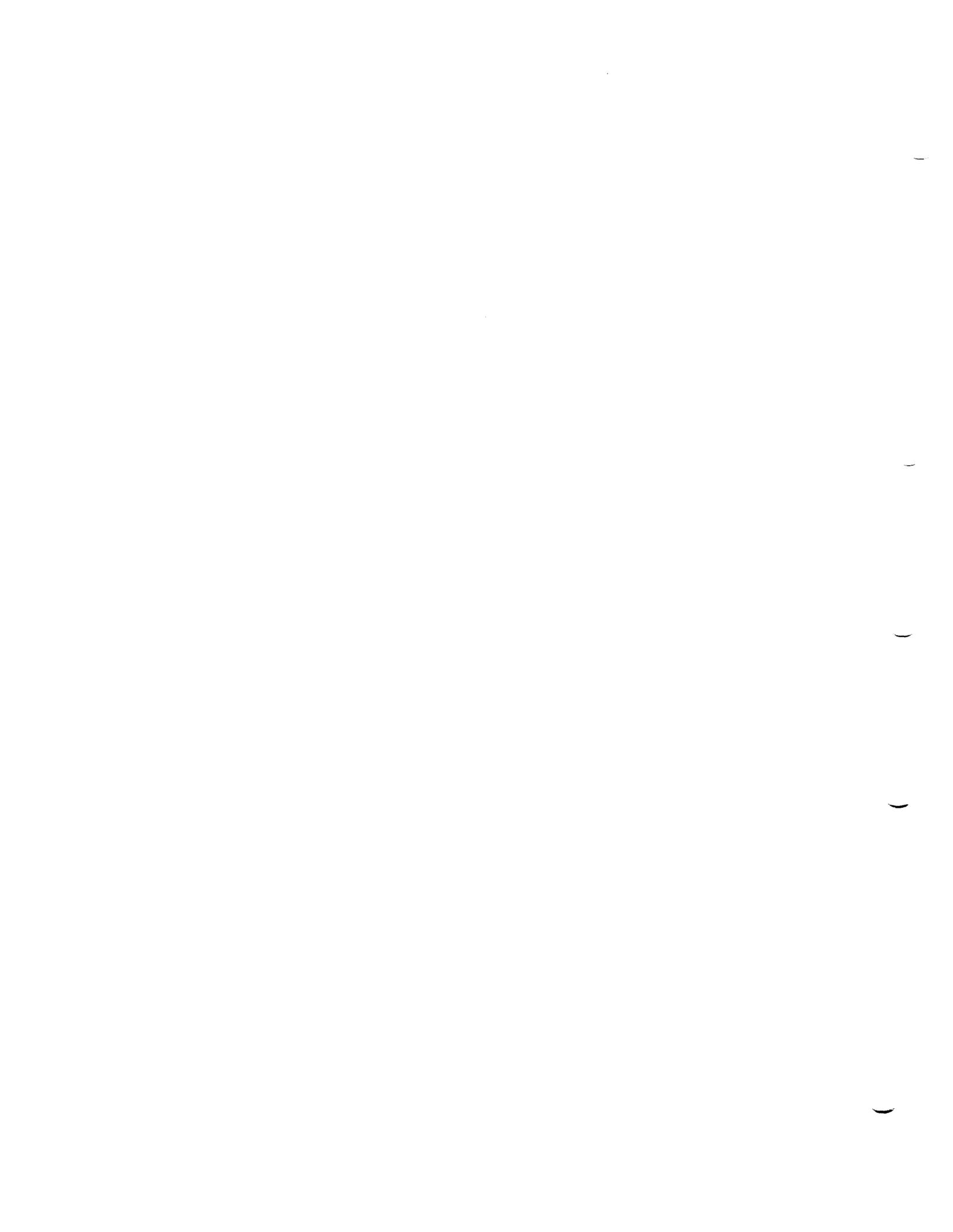
POP

/^Z
$JOB 0/
ATTACH OPERATOR 1

POP

/
SJ 0: @
SJ 0: @ATTACH OPERATOR 1
SJ 0: [ATTACHED TO TTY205, CONFIRM]

[JOB 1 DETACHED BY USER ON TERMINAL 206]
SJ 0: POP
SJ 0: PTYCON>
```



CHAPTER 4

OPERATOR SERVICE PROGRAMS

When you start the system for timesharing, some operator service programs start automatically; others you must start when you need them. All these programs and some commands are necessary to handle user requests, to satisfy the users' and system manager's needs, and to communicate easily with users. The list of these programs may vary slightly from one installation to another because of different peripherals and applications. This chapter, however, describes the standard operator service programs and some commands that will aid you in operating the system efficiently.

4.1 CONTROLLING SEVERAL JOBS WITH PTYCON

Many system programs are needed to process the various requests from timesharing and batch users. These requests include mounting magnetic tapes, printing listings on the line printer, reading batch jobs from the card reader, and answering users' questions. To handle these tasks quickly and accurately, you must communicate efficiently with the jobs running the appropriate system programs.

PTYCON is the system program that helps you run several jobs concurrently and respond easily to any of them. It gives you multiple job control, allowing you to perform all software-oriented operator tasks from a single terminal.

4.1.1 Automatically Starting Other Jobs

When the TOPS-20 monitor starts running, it automatically starts PTYCON, which reads a command file to start the necessary operator jobs. SYSJOB (Section 3.4) actually starts PTYCON and makes it use the command file SYSTEM:PTYCON.ATO. (Section 4.1.3 has a sample ATO file under the description of the GET command to PTYCON.)

If PTYCON doesn't use PTYCON.ATO automatically, you can attach to PTYCON (Section 3.4.1) and, after you see the prompt PTYCON>, type:

```
GET SYSTEM:PTYCON.ATO
```

You could also follow the GET with a different file specification to use a special ATO file.

OPERATOR SERVICE PROGRAMS

The following is an example of the output generated by PTYCON after the TOPS-20 monitor starts.

```
SJ 0: $PTYCON
SJ 0: PTYCON> GET SYSTEM:PTYCON.ATO
SJ 0: PTYCON> SILENCE
SJ 0: PTYCON.LOG.1
SJ 0: PTYCON> B-START
SJ 0: PTYCON> L-START PLPT0=LPT0
SJ 0: PTYCON>
SJ 0: **** L(0) 10:57:48 ****
SJ 0: START PLPT0=LPT0
SJ 0: LPTSPL>
SJ 0: **** B(1) 10:57:50 ****
SJ 0: START
SJ 0: !
SJ 0: PTYCON> ;LPT1:L1-START PLPT1=LPT1
SJ 0: PTYCON> ;CDR:S-START PCDR0:=CDR0:
SJ 0: PTYCON> WHAT ALL
SJ 0: L(0)          4      OPERATOR   LPTSPL   TI        0:0:0
SJ 0: B(1)          5      OPERATOR   BATCON   TI        0:0:0
SJ 0: P(2)          3      OPERATOR   OPLEAS   RN        0:0:0
SJ 0: O(3)          2      OPERATOR   EXEC     TI        0:0:0
```

It is important to look at this output when the system starts to check if the proper programs started. If you attach to the PTYCON job, you should also give a WHAT ALL command to PTYCON to check the status of these programs. (See the WHAT command in Section 4.1.3 to interpret the output.)

The commands to start and control programs under PTYCON are in the file SYSTEM:PTYCON.ATO. Your system manager must decide what those commands should be. If they differ from those in the PTYCON.ATO file supplied, you must change the file with EDIT. The programs normally run are:

1. BATCON, the batch controller
2. LPTSPL, the line printer spooler, one for each line printer
3. SPRINT, the spooling processor for card input, if you have a card reader
4. OPLEAS, the program for handling PLEASE, SMOUNT, SREMOVE, and TMOUNT requests

PTYCON also starts an open job, defined as 0, which you can use for various tasks.

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4.1.2 Communicating with PTYCON and Its Subjobs

PTYCON will allow you to start and control as many jobs as there are pseudo-terminals (PTYs) in the system, but never more than 24. (You can type the command INFORMATION (ABOUT) AVAILABLE DEVICES to find out how many PTYs are available on your system.) The jobs that are started under PTYCON are called subjobs.

The standard operator service programs start automatically under PTYCON subjobs. However, you may need to start other subjobs. For example, you need another subjob if you want to control from the CTY a program not started by PTYCON.ATO. Also, if subjob 0 is busy, you may want another subjob to do a task from the CTY.

Before you try to start a subjob under PTYCON, be sure that PTYCON is running. If it is, you should see the prompt PTYCON>. To get the prompt, you may have to type POP or the PTYCON escape character, CTRL/X by default. (See the CONNECT, PUSH, and REDEFINE commands to PTYCON in Section 4.1.3.) If PTYCON is not running, type PTYCON at system command level. For example,

```
@PTYCON  
PTYCON>
```

When PTYCON is running and has output its prompt, PTYCON>, you can communicate with it or its subjobs in the following ways.

1. You can type any PTYCON command (Section 4.1.3).
2. You can type a single-line subjob command to an existing subjob. A single-line subjob command is:

n-text

where n is the subjob name or number and text is a TOPS-20 command or input to a program running under subjob n.
3. You can give the CONNECT command to PTYCON to connect to a subjob. Then you can communicate directly with the subjob by typing exactly what you would type to a job not under PTYCON. To later return to PTYCON command level, type the PTYCON escape character, CTRL/X by default.
4. You can give the PUSH command to PTYCON to perform a task at TOPS-20 command level. You can type commands or run programs as you would under any job, but you do not have to log in a job. To return to PTYCON command level, type POP.

In communicating with a subjob, you can use all the standard TOPS-20 features. You can use CTRL/C, CTRL/T, CTRL/R, CTRL/U, recognition, rubout, DDT, EDIT, languages, and system commands. However, there are some restrictions.

1. If you are at PTYCON command level and you rub out as many characters as you typed in the last field, you get a bell or beep. This indicates that you cannot rub out any more characters.
2. You can never pass the current PTYCON escape character to a subjob, because it has a special purpose. (See the CONNECT command in Section 4.1.3.)

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3. CTRL/\ (control backslash) cannot be passed to a job or subjob from the CTY, because it causes you to enter the console processor command language (Appendix C). If you type CTRL/\ by mistake, immediately type QUIT.
4. If you are giving a single-line subjob command like:

```
PTYCON> 0-TYPE A.TXT
```

you can't use recognition, because the command isn't passed to the system until you press RETURN or LINE FEED.

To create a subjob, use either the CONNECT or DEFINE command. When you give either command with a number that has not yet been assigned to a subjob, you create a subjob with that number. If you type ESCAPE in place of a number in the DEFINE command, you create a subjob with the next free subjob number. The DEFINE command also allows you to associate a name with the subjob.

NOTE

Whenever you create a subjob, you must then log in, as you do for any other job, to get a system job number. You can use a fictitious password if you log in under the same name that PTYCON is logged in under.

----- Examples -----

1. Using CONNECT to create a subjob:

```
PTYCON> CONNECT 0  
[CONNECTED TO SUBJOB 0]
```

2. Using DEFINE to create a subjob with the name M:

```
PTYCON> DEFINE 1 M
```

Once a subjob exists, you can communicate with it by:

1. A single-line command
2. Direct connection

The single-line command must be given after the prompt PTYCON>. The format of the command is subjob name or number, followed by a hyphen, and the text to be sent to the subjob. The subjob name is an alternative way of specifying the subjob. It is established with the DEFINE command.

When you are giving a single-line command, be sure that you know if your subjob is awaiting program input or is at system command level. The last character output by the subjob is "@" or "\$" if it's at system command level, and a program-specific prompt if it's awaiting program input. If it is awaiting program input and you want to give it a system command, first send it CTRL/C (followed by RET to end the single-line command). Then send it the desired system command via another single-line command.

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----- Examples -----

1. Creating a subjob with the name OP and logging it in with a single-line command:

```
PTYCON> DEFINE 3 OP
PTYCON> OP-LOG OPERATOR FOO OPERATOR
```

2. Creating a subjob, logging it in, and sending it other single-line commands:

```
PTYCON> DEFINE 2
PTYCON> 2-LOG DEMO F 10400
PTYCON>
**** 2 12:28:39 ****
```

```
LOAD-TEST SYSTEM, TOPS-20 MONITOR 3(1271)
@LOG DEMO 10400
JOB 17 ON TTY103 18-NOV-76 12:28
```

```
@
PTYCON> 2-FILCOM
PTYCON>
**** 2 12:28:55 ****
```

FILCOM

```
*
PTYCON> 2-=A.ATO,B.ATO
PTYCON>
**** 2 12:29:09 ****
=A.ATO,B.ATO
```

No differences encountered

```
*
PTYCON> 2-^C
PTYCON>
**** 2 12:29:20 ****
^C
@
@
PTYCON> 2-SY .
PTYCON>
**** 2 12:29:34 ****
SY .
17* 103 EXEC DEMO
@
PTYCON>
```

To communicate with a subjob by direct connection, use the CONNECT command, type exactly what you want to communicate to the subjob, then finish with the PTYCON escape character, normally CTRL/X.

When you connect to a subjob that has not been logged in, the first character that you type will cause the identification message to be output on your terminal.

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----- Example -----

```
PTYCON> CONNECT 3
[CONNECTED TO SUBJOB 3]

LOAD-TEST SYSTEM, TOPS-20 MONITOR 3(1271)
@LOG BONS 10400
JOB 19 ON TTY110 18-NOV-76 11:00
@DIR

    <BONS>
    A.ATO.1
    PTYCON.ATO.1

TOTAL OF 3 FILES
@^X
PTYCON>
```

NOTE

You can't send the current PTYCON escape character to a subjob, because that character returns you to PTYCON command level if you are connected to a subjob, or it aborts the current command if you are at PTYCON command level. However, you can change that character with the REDEFINE command to PTYCON.

You can do the following with the output from subjobs.

1. Allow it to be typed on your terminal.
2. Buffer it until you request it.
3. Save it in a file.
4. Discard it.

The PTYCON commands which control the output of the subjobs either collectively or individually are:

1. ACCEPT
2. REFUSE
3. LOG
4. DISCARD

If REFUSE is set for a subjob, its output is typed on your terminal only when you are connected to the subjob. Otherwise, the output is buffered until you request it with the ACCEPT (or NO REFUSE) command or until you connect to the subjob. If DISCARD is set for a subjob, again its output is printed on your terminal only when you are connected to the subjob. Otherwise, the output is discarded, except for recording it in a file if the PTYCON LOG command was given.

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If neither REFUSE nor DISCARD has been set for a subjob, the subjob's output is printed on your terminal. If PTYCON is at command level, output from each subjob is preceded by a header containing the subjob name and number and the time. If you are connected to a subjob:

1. All output from the connected subjob is printed on your terminal without headers.
2. All other subjob output is printed on your terminal and preceded by a header containing the name and number of the subjob giving output and the time. The output is followed by a trailer containing the name and number of the connected subjob and the time.

NOTE

If you are at command level and entering a command, PTYCON temporarily suspends output from the subjobs.

----- Example -----

While you are connected to subjob 3, output is typed from subjob 1, which is defined as P, beginning with a header (**** P(1) time ****). When the output from subjob 1 is done, the trailer is output, indicating that the currently connected subjob is 3 (**** 3 time ****).

```
PTYCON> CONNECT 3
[CONNECTED TO SUBJOB 3]
**** P(1) 12:34:27 ****
```

```
[PLEASE: User OSA job 20 Line 21 Received at 5-FEB-76 15:03:53]
IS MTAL IN USE?
**** 3 12:34:32 ****
```

When you have completely finished using a subjob, you can log it out and deassign its subjob number with the KILL command. (See details under the KILL command to PTYCON.)

----- Examples -----

1. PTYCON> KILL P
2. PTYCON> KILL 2

To leave PTYCON permanently, you should be certain that you have no more use for any of the subjobs; then use KILL ALL and EXIT. During timesharing, you should never do this to the PTYCON controlling the batch components and other operator service programs, because you need them to service users.

----- Example -----

```
PTYCON> KILL ALL
PTYCON> EXIT
$
```

If you want to leave PTYCON temporarily to do something at system command level and not use a subjob, use the PUSH command, perform your commands, and return to PTYCON with POP. (See the example under PUSH in Section 4.1.3.)

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4.1.3 PTYCON Commands

The commands to PTYCON with their guide words in parentheses are shown in the PTYCON help message below.

```
ACCEPT (OUTPUT FROM SUBJOBS)      *
BELL (WHEN OUTPUT WAITING)        *
CONNECT (TO SUBJOB)
DEFINE (SUBJOB #)
DISCARD (OUTPUT FROM SUBJOB)      *
EXIT (FROM PTYCON)
GET (COMMANDS FROM FILE)
HELP MESSAGE
KILL (SUBJOB)
LOG (OUTPUT TO FILE)              *
PUSH (EXEC LEVEL)
REDEFINE (PTYCON ESCAPE CHARACTER TO BE)
REFUSE (OUTPUT FROM SUBJOBS)      *
SILENCE (ALL OUTPUT TO TERMINAL)  *
WHAT (IS STATE OF SUBJOB)
```

"*" MEANS THE COMMAND CAN BE PRECEDED BY "NO" TO REVERSE ITS MEANING

THE ESCAPE CHARACTER TO RETURN TO COMMAND LEVEL IS: ^X

NOTE

In the discussion of the PTYCON commands below, n represents a subjob name or number. ALL represents all subjobs.

```
ACCEPT n,...,n
ACCEPT ALL
NO ACCEPT n,...,n
NO ACCEPT ALL
```

The ACCEPT command allows you to receive output on your terminal from the specified subjobs. This is the normal mode. When used after NO ACCEPT or REFUSE, the ACCEPT command immediately types out any available output from the specified subjobs onto your terminal and continues to output information from the subjobs as it becomes available. If you do not specify any subjobs, ALL is automatically output and assumed.

NO ACCEPT is equivalent to REFUSE. If you do not specify any subjobs, ALL is assumed.

----- Example -----

```
PTYCON> ACCEPT ALL
```

```
BELL
NO BELL
```

The BELL command causes a bell to ring or a beep to sound every ten seconds to indicate that a refused subjob has output waiting. This is the normal mode. Therefore, you need to give the BELL command only when you want to cancel a NO BELL command that you previously issued.

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When you give the PUSH command to PTYCON, the output from all subjobs is implicitly refused, unless it is already being discarded. The BELL command also applies to these implicitly refused subjobs.

NO BELL suppresses any bell, indicating that a refused or implicitly refused subjob has some output. Consequently, you are not warned that there is output waiting.

----- Example -----

```
PTYCON> NO BELL
```

CONNECT n

This command connects your terminal to subjob n such that the subjob will appear to be a normal timesharing job that is not running under PTYCON. All commands that follow are passed directly to subjob n until you type the PTYCON escape character, which is CTRL/X by default. You can redefine the escape character with the REDEFINE command to PTYCON.

As soon as you connect to a subjob, you receive the message [CONNECTED TO SUBJOB name(n)] or [CONNECTED TO SUBJOB n]. Then any output that was being buffered for that subjob by the REFUSE or NO ACCEPT command is output on your terminal.

If you do not specify a subjob, PTYCON connects your terminal either to the last connected subjob or to the last subjob defined, whichever was done most recently. If you specify a valid subjob number that you haven't defined, a new subjob with that number will be created for you. However, you may not specify a subjob name that hasn't been defined.

NOTE

When you are connected to a subjob, type the PTYCON escape character, CTRL/X by default, to return to PTYCON. Then you will see the PTYCON prompt.

----- Example -----

```
PTYCON> CONNECT 2
[CONNECTED TO SUBJOB 2]
^X
PTYCON>
```

DEFINE number name

This command defines a subjob, i.e., it can create a new subjob, and it can associate a name with a subjob. If you press ESCAPE for the subjob number, the next free subjob number is chosen; this is the recommended way to define a new subjob.

You can define a new name for an existing subjob by giving the DEFINE command again with the new name. If you define a subjob with a name already given to another subjob, you get the message:

```
% NAME ALREADY IN USE, REASSIGNED TO THIS SUBJOB
```

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and the name is given to the new subjob. Also, defined names take precedence over subjob numbers when you define a subjob to be another number. If ALL is the name of a subjob, whenever you use ALL in a PTYCON command, it refers only to that subjob.

The name, which is optional, consists of up to five alphanumeric characters. PTYCON simply ignores any characters after the fifth one; it also ignores nonalphanumeric characters.

----- Example -----

```
PTYCON> DEFINE (SUBJOB #) 2 (AS) T
```

```
DISCARD n,...,n
DISCARD ALL
NO DISCARD n,...,n
NO DISCARD ALL
```

The DISCARD command allows you to eliminate output to your terminal from the specified subjob when you are not connected to that subjob. The output is thrown away as far as your terminal is concerned. However, output from the subjob does go into the LOG file, if the LOG command to PTYCON is in effect.

DISCARD differs from REFUSE, because REFUSE keeps the output for acceptance at a later time. Yet, if you discard a subjob's output after you have refused it, the output buffered by REFUSE will not be typed on your terminal. However, at the time of the DISCARD, any output buffered by REFUSE goes into the LOG file, providing the LOG command to PTYCON is in effect.

NO DISCARD, which is the normal mode, allows all output to appear on your terminal. However, if a REFUSE had been done for the subjob before the DISCARD, NO DISCARD puts the output of the subjob back into REFUSE mode and buffers output. (See the REFUSE command below.)

----- Example -----

```
PTYCON> DISCARD 3
```

EXIT

This command allows you to exit from PTYCON and gets you back to system command level. Use EXIT only when you want to leave PTYCON permanently. To return to system command level temporarily while subjobs are running, use the PUSH command.

If there are subjobs active when you type EXIT, you will get:

```
CAUTION: EXITING MAY LOG OUT THE STILL ACTIVE SUBJOBS!
CONFIRM: (TYPE CONTROL-a TO GET BACK TO PTYCON)
```

where "a" is the current PTYCON escape character. Type that control character to return to PTYCON immediately. If you press RETURN to CONFIRM, you exit from PTYCON and may lose the subjobs.

----- Example -----

In this case there were no active subjobs.

```
PTYCON> EXIT
@
```

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----- Hint -----

If you mistakenly type EXIT and press RETURN to CONFIRM, immediately type CONTINUE to return to PTYCON and preserve any subjobs. If you first run a program or give some command and then type CONTINUE, you may not be able to get back to PTYCON. If this happens, subjobs become detached and are automatically logged out in five minutes unless corrective measures are taken. Therefore, to recover them, immediately run PTYCON again. Then, for each subjob that became detached, connect to a new subjob and attach to a system job corresponding to a detached subjob. (Use the SYSTAT command to see what jobs were detached.) Note that you can't refer to the former subjob numbers; you must use the system job numbers until you establish PTYCON subjobs again.

To attach system jobs 6 and 7 that became detached and to make them subjobs with their former names, type:

```
@ENABLE
$PTYCON
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0]

LOAD-TEST SYSTEM, TOPS-20 MONITOR 3(1271)
@ATTACH (USER) OPERATOR (JOB #) 6
@^X
PTYCON> DEFINE 0 L
PTYCON> CONNECT 1
[CONNECTED TO SUBJOB 1]

LOAD-TEST SYSTEM, TOPS-20 MONITOR 3(1271)
@ATTACH OPERATOR 7
@^X
PTYCON> DEFINE 1 B
```

If five minutes have passed and the former subjobs have become logged-out jobs, type:

```
@ENABLE
$PTYCON
PTYCON> GET SYSTEM:PTYCON.ATO
```

This assumes that you have lost all the operator service jobs originally started from SYSTEM:PTYCON.ATO. The above GET command to PTYCON starts them all again.

GET file specification

This command reads and executes the commands in the specified file. If you do not give a file specification, the file PTYCON.ATO in your directory is assumed. When the system is first started, SYSJOB normally starts PTYCON and has PTYCON do a GET on SYSTEM:PTYCON.ATO. When the commands in the file are processed, they are echoed on your terminal as if they had been typed in directly (unless SILENCE is in effect).

----- Example -----

To have PTYCON perform the commands in <SYSTEM>AUX.ATO:

```
PTYCON> GET <SYSTEM>AUX.ATO
```

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NOTE

Certain characters in the command file must be typed differently than if they were typed directly on your terminal. Control characters must be typed as ^a, where ^ is the up-arrow, or circumflex, and "a" is the character. Do not use the CTRL key for typing control characters in the command file. ESCAPE must be typed as two characters ^\$ (up-arrow dollar sign). An up-arrow must be typed as ^^ (two up-arrows).

This is a sample SYSTEM:PTYCON.ATO file with comments added.

```

SILENCE                !silence output to CTY
LOG                    !create LOG file PTYCON.LOG
DEFINE ^$L            !define subjob 0 as L
;LPT1:DEFINE ^$L1     !for a second printer
DEFINE ^$B            !define subjob 1 as B
DEFINE ^$P            !define subjob 2 as P
;CDR:DEFINE ^$S       !for a card reader
DEFINE ^$O            !define subjob 3 as O
CONN O                !connect to subjob 0
LOG OPERATOR FOO OPERATOR !log in
^X                    !return to PTYCON
O-ENABLE              !enable capabilities
O-RUN SYSTEM:CHECKD   !run CHECKD under O
O-CHECK DIRECTORY     !use CHECK DIRECTORY command
O-EXIT               !exit from CHECKD
O-DISABLE             !disable capabilities
CONN P                !connect to subjob P
LOG OPERATOR FOO OPERATOR !log in
ENABLE               !enable capabilities
OPLEAS               !run OPLEAS
^X                    !return to PTYCON
P-                   !don't require an id
CONN L                !connect to subjob L
LOG OPERATOR FOO OPERATOR !log in
ENA                  !enable capabilities
LPTSPL               !run LPTSPL
^X                    !return to PTYCON
;LPT1:CONN L1        !connect to subjob L1
;LPT1:LOG OPERATOR FOO OPERATOR !log in
;LPT1:ENA            !enable capabilities
;LPT1:LPTSPL         !run LPTSPL
;LPT1:^X            !return to PTYCON
CONN B                !connect to subjob B
LOG OPERATOR FOO OPERATOR !log in
ENA                  !enable capabilities
BATCON               !run BATCON
^X                    !return to PTYCON
;CDR:CONNECT S       !connect to subjob S
;CDR:LOGIN OPERATOR FOO OPERATOR !log in
;CDR:ENABLE          !enable capabilities
;CDR:SPRINT          !run SPRINT
;CDR:^X              !return to PTYCON
NO SILENCE           !allow output to CTY
B-START              !start BATCON
L-START PLPT0=LPT0   !start LPTSPL
;LPT1:L1-START PLPT1=LPT1 !start second LPTSPL
;CDR:S-START PCDR0:=CDR0 !start SPRINT
WHAT ALL             !print status of all subjobs

```

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NOTE

When you run PTYCON under OPERATOR (the normal case), for any subjob you log in under OPERATOR you may give a fictitious password, e.g., FOO in the above sample.

HELP MESSAGE

This command prints a list of PTYCON commands with guide words.

----- Example -----

```
PTYCON> HELP
```

THE DEFINED COMMANDS ARE:

```
ACCEPT (OUTPUT FROM SUBJOBS)      *
BELL (WHEN OUTPUT WAITING)        *
CONNECT (TO SUBJOB)
DEFINE (SUBJOB #)
DISCARD (OUTPUT FROM SUBJOB)      *
EXIT (FROM PTYCON)
GET (COMMANDS FROM FILE)
HELP MESSAGE
KILL (SUBJOB)
LOG (OUTPUT TO FILE)              *
PUSH (EXEC LEVEL)
REDEFINE (PTYCON ESCAPE CHARACTER TO BE)
REFUSE (OUTPUT FROM SUBJOBS)      *
SILENCE (ALL OUTPUT TO TERMINAL)  *
WHAT (IS STATE OF SUBJOB)
```

"*" MEANS THE COMMAND CAN BE PRECEDED BY "NO" TO REVERSE ITS MEANING

THE ESCAPE CHARACTER TO RETURN TO COMMAND LEVEL IS: ^X

```
KILL n,...,n
KILL ALL
```

This command kills the indicated subjobs (logs them out) and deassigns the subjob numbers, provided that PTYCON is running with OPERATOR or WHEEL capability enabled, or that the subjobs are logged in under the same user name as PTYCON. If these conditions are not true, the command will not succeed, and you will receive the message:

```
COULD NOT KILL SUBJOB n
```

Then, you must connect to the subjob, log out, return to PTYCON, and issue the KILL command. For KILL ALL you must type ALL in its entirety.

The KILL command is necessary to deassign a subjob number. Simply logging out a subjob doesn't deassign the subjob number.

----- Example -----

```
PTYCON> KILL T
```

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LOG file specification
NO LOG

The LOG command causes all interactions with PTYCON to be recorded in the specified file. If you do not specify a file, PTYCON.LOG is assumed. If you omit only the file type, .LOG is assumed. If you specify a file that already exists, any new output is appended after the last entry of the existing file. Use this command to keep a record of what was typed at the console terminal.

NO LOG, which is the normal mode, stops output to a log file and closes the file. This is the only command that stops output to the LOG file.

Once the LOG command is given, the log file contains PTYCON prompts, commands, and error messages; all input to subjobs; and all output from subjobs. The order of information in the file resembles the input and output to PTYCON at your terminal. However, if you do a DISCARD for a subjob, or GET a file which has a SILENCE command, the log file contains all interactions as they occur, but your terminal output does not. (See DISCARD and SILENCE.) Also, when you do a DISCARD for a subjob after a REFUSE, the log file gets all the output buffered by the REFUSE, and then gets all output from the subjob as it occurs. However, your terminal will not get output from a subjob once a DISCARD is done.

----- Example -----

```
PTYCON> LOG NOV18
```

PUSH

This command allows you to perform a task at system command level without affecting subjobs. However, output from subjobs is suspended. Like REFUSE, PUSH causes a bell or beep to sound when output is waiting, providing the BELL command is in effect. When you return to PTYCON, waiting output is printed on your terminal.

The advantage of this command is that you do not have to use another subjob or job number to do a task at system command level. However, commands given after a PUSH from PTYCON and before a POP are not entered in the LOG file.

NOTE

Do not log out while you are pushed from PTYCON.

To return to PTYCON, type POP.

----- Example -----

```
PTYCON> PUSH
```

```
TOPS-20 COMMAND PROCESSOR 3(357)
@SY .
12* 20 EXEC BONS
@POP
PTYCON>
```

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REDEFINE CTRL/character

The REDEFINE command allows you to change the escape character to return to PTYCON command level. By default, the escape character is CTRL/X. With this command you can change it to any control character that is not treated specially by the system. Thus, you can use CTRL/character, where character is one of the following: A, B, D, E, F, G, H, K, N, P, Q, S, T, X, Y, or Z. Do not use CTRL/Q or CTRL/S, however, if you have TERMINAL PAGE mode set.

----- Example -----

```
PTYCON> REDEFINE ^B
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0]
SYSTAT .
  37* 133 EXEC BONS
@^B
PTYCON>
```

```
REFUSE n,...,n
REFUSE ALL
NO REFUSE n,...,n
NO REFUSE ALL
```

The REFUSE command allows you to refuse output from the specified unconnected subjobs. A bell or beep will sound every ten seconds if a refused subjob has output waiting. (See the BELL command to PTYCON.) Because the output is buffered, you can later get the output on your terminal by typing ACCEPT or NO REFUSE for the subjob or by connecting to the subjob. At that time the output is also written into the log file, providing the PTYCON LOG command is in effect. If you don't give an argument, ALL is assumed.

NO REFUSE, which is the normal mode, is equivalent to ACCEPT.

----- Example -----

```
PTYCON> REFUSE ALL
```

```
SILENCE
NO SILENCE
```

These commands are effective only when given in the file on which you do a GET. SILENCE discards any output that would normally be output on your terminal while PTYCON processes the file specified in the GET command. SILENCE does not stop output to a log file.

NO SILENCE, which is the normal mode, allows all output on your terminal while PTYCON processes the file specified in a GET command.

(For an example, see the sample ATO file under the GET command to PTYCON.)

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NOTE

If you have a SILENCE command in a file on which you intend to do a GET, you should then include a NO SILENCE in the file. If you don't, the SILENCE command suppresses the last PTYCON prompt on your terminal.

WHAT n
WHAT ALL

This command will give you a status report for specified subjobs. If you do not give an argument, PTYCON gives the status for all the subjobs. One line of information is given for each subjob.

The information for a logged-in subjob is:

subjob name--if it has one
subjob number--in parentheses if there is a subjob name
system job number
user logged in under the subjob
program running under the subjob
state of the job:

1. RN meaning running
2. TI meaning ready for terminal input
3. TO meaning the subjob has terminal output waiting
4. Any of the three above followed by (R), meaning the REFUSE or NO ACCEPT command is in effect for the subjob, or (D), meaning the DISCARD command is in effect for the subjob

runtime of the job in hours:minutes:seconds

If a subjob is defined but not logged in, the information is:

subjob name--if it has one
subjob number--in parentheses if there is a subjob name
system job number--if assigned, or, if the subjob has only
been defined, the message NO JOB NUMBER ASSIGNED
message NOT LOGGED IN--if the LOGIN is not complete
state of the job--see above
runtime of the job--hours:minutes:seconds

----- Example -----

```
PTYCON> WHAT ALL
A(0)          NO JOB NUMBER ASSIGNED          TI
M(1)          42          BONSAVAGE  WATCH          RN          0:0:1
2             41          MASELLA    EXEC          TI(R)         0:0:2
B(3)          16          BONSAVAGE  EXEC          TO           0:0:0
PTYCON>
```

OPERATOR SERVICE PROGRAMS

4.1.4 PTYCON Warning and Error Messages

----- Warning Message -----

8 NAME ALREADY IN USE, REASSIGNED TO THIS SUBJOB

This message says that you defined a subjob with a name that was already assigned to another subjob. Therefore, PTYCON has removed the name from the other subjob and assigned it to the one you just defined. You can still reference the other subjob by its subjob number.

----- Error Messages -----

? DOING A "GET" WITHIN A "GET" IS ILLEGAL

You are not allowed to process a GET from a file upon which you have done a GET.

? ILLEGAL SUBJOB DESIGNATOR

You referenced a subjob name that did not exist, or you tried to assign to a subjob a number that is larger than the number of PTYs on the system.

? NO EXEC

You did a PUSH, and there was no system command language, SYSTEM:EXEC.EXE, to run. Notify your system manager.

? NO LOWER FORKS AVAILABLE

You did a PUSH command, and there were no free processes available.

? NO MORE PTY'S AVAILABLE!

You tried to create another subjob, and there were no free PTYs to run the job.

? SUBJOBS ACTIVE, USE "PUSH" COMMAND!

You typed a CTRL/C to PTYCON and there were subjobs active. If you want to do a task at system level, use the PUSH command. If you really want to exit from PTYCON, see the EXIT command to PTYCON.

? TOO FEW ARGUMENTS!

You didn't give the proper arguments for the command you typed. Because of the severity of the DISCARD and KILL commands, they require either a subjob name or number, or ALL typed in its entirety. Also, these two commands do not accept ESCAPE for the argument.

? TYPE "EXIT" TO EXIT FROM PTYCON!

You typed a CTRL/C to PTYCON and there were no subjobs active. However, you must still type EXIT to exit from PTYCON.

? UNEXPECTED PTYCON ERROR: CANNOT ENABLE FOR CONTROL-C INTERCEPT

You cannot run PTYCON if you have done a SET NO CONTROL-C-CAPABILITY. Do a SET CONTROL-C-CAPABILITY and then run PTYCON.

OPERATOR SERVICE PROGRAMS

? UNEXPECTED PTYCON ERROR: COULDN'T GET HANDLE ON TTY FOR BINARY CHANNEL

This is an unexpected error and is not a result of any error on your part. Notify your software contact or system manager. You can try START immediately after the message and check the status of the subjobs. If that doesn't work, run PTYCON again, and within five minutes attach to the subjobs that became detached jobs.

? UNEXPECTED PTYCON ERROR: COULDN'T OPEN THE TTY IN BINARY FOR PTY COMMUNICATION

This is an unexpected error and is not a result of any error on your part. Notify your software contact or system manager. You can try START immediately after the message and check the status of the subjobs. If that doesn't work, run PTYCON again, and within five minutes attach to the subjobs that became detached jobs.

? UNEXPECTED PTYCON ERROR: DIDN'T GET LINEFEED AFTER RETURN FROM TERMINAL INPUT

This is an unexpected error and is not the result of any error on your part. Notify your software contact or system manager. PTYCON will continue to run.

? UNEXPECTED PTYCON ERROR: PANIC LEVEL INTERRUPT OCCURRED!

This is an unexpected error and is not the result of any error on your part. Notify your software contact or system manager. PTYCON will continue to run.

? UNEXPECTED PTYCON ERROR: RDTXT JSYS FAILED

This is an unexpected error and is not a result of any error on your part. Notify your software contact or system manager. You can try START immediately after the message and check the status of the subjobs. If that doesn't work, run PTYCON again, and within five minutes attach to the subjobs that became detached jobs.

? UNEXPECTED PTYCON ERROR: TABLK2: TABLE NOT IN PROPER FORMAT

This is an unexpected error and is not the result of any error on your part. Notify your software contact or system manager. PTYCON will continue to run.

? UNRECOGNIZED PTYCON COMMAND

You typed something to PTYCON which was not a PTYCON command. Type HELP to PTYCON for a list of PTYCON commands and their guide words.

OPERATOR SERVICE PROGRAMS

4.2 CONTROLLING BATCH JOBS

To handle batch jobs, you must have the following programs running.

1. INFO, the message identification handler
2. QUASAR, the queue manager
3. BATCON, the batch controller
4. LPTSPL, the line printer spooler, one for each line printer
5. SPRINT, the spooling processor for card input, if you have a card reader

Normally, the last three programs are started automatically under PTYCON. INFO and QUASAR are run automatically under SYSJOB.

(Detailed information on the batch programs, including running them, giving commands to them, and restarting them, is contained in the DECSYSTEM-20 Batch Operator's Guide. Be sure it is available.)

If users are submitting batch jobs on card decks, your system manager should establish:

1. Where the decks must be placed for submission
2. When the decks will be read
3. Where and when the decks and output will be returned to users

OPERATOR SERVICE PROGRAMS

4.3 HANDLING PRINT REQUESTS WITH LPTSPL

To handle users' requests to have files printed and to have specific forms used in printing, the LPTSPL program must be running. Normally, it is started automatically under PTYCON.

Because LPTSPL is also used heavily by the batch system, it is documented in the DECSYSTEM-20 Batch Operator's Guide. You must refer to that manual for detailed information on commands to LPTSPL and restarting LPTSPL.

Note that the LP05 and LP14 line printers have a direct access, vertical format unit. (Refer to MAKVFU.DOC and MAKVFU.HLP.) The LP10 line printer, however, uses a standard sprocketed carriage tape for the vertical format unit. (For more information on vertical formatting, see Chapter 7.)

After several listings have been printed, you must remove them from the line printer, separate them, and distribute them. Your system manager should set up the distribution method which includes:

1. Where you must put the listings so that users can pick them up
2. When you must distribute them

OPERATOR SERVICE PROGRAMS

4.4 COMMUNICATING WITH USERS

Timesharing and batch users often need to communicate with you to mount and dismount tapes or disk packs, tell you something, or ask for help. The following sections tell you how to:

1. Respond to PLEASE requests.
2. Respond to SMOUNT requests.
3. Respond to SREMOVE requests.
4. Respond to TMOUNT requests.
5. Run OPLEAS.
6. Help another user via TALK.
7. Mail a message to a user via MAIL.
8. Read with RDMAIL any messages sent to you.
9. Send a message to any or all users immediately with ^ESEND.

OPERATOR SERVICE PROGRAMS

4.4.1 Answering PLEASE Requests via OPLEAS

When a user sends a message with PLEASE, you receive a message at the console terminal from which OPLEAS is running. You can get two types of messages.

1. If the user sent via PLEASE a one-way message (one line ending with ESCAPE or CTRL/Z), OPLEAS outputs:

```
[PLEASE: ONE-WAY SENT AT time]
[USER name LINE y RECEIVED AT time]
text of user's message
```

where name is the user's name, y is the user's line number, and time is when the message was received. You can't type any response to this message. However, you should pay attention to what the user said in the line of text and, if possible, do what the user requested. If further communication is necessary, use TALK (Section 4.4.6), MAIL (Section 4.4.7), or ^ESEND (Appendix A).

2. If the user sent via PLEASE a two-way message (lines ending with `RET`), OPLEAS outputs:

```
[PLEASE: USER name JOB n LINE y RECEIVED AT date time]
text of user's message
```

where name is the user's name, n is the user's job number, y is the user's line number, and date and time is when the message was received. When you are responding to a user in a two-way conversation, you must type to the PTYCON subjob that is running OPLEAS. You can either CONNECT to the subjob or give it one-line commands. This two-way conversation continues until either of you types CTRL/Z or presses ESCAPE. PLEASE messages from other users are queued until this conversation ends.

----- Example -----

The following example shows what would appear on your terminal, which is running OPLEAS as a subjob of PTYCON, after a user sent a two-way message with PLEASE.

```
**** P(3) 14:39:44 ****
[PLEASE: USER BONSAVAGE JOB 25 LINE 112 RECEIVED AT
13-NOV-76 14:39:40]

WHEN CAN I GET A MAGNETIC TAPE DRIVE?
PTYCON> P-IN ABOUT 2 HRS
PTYCON>
**** P(3) 14:40:29 ****
IN ABOUT 2 HRS
PTYCON>
**** P(3) 14:40:39 ****
OKAY

[FINISHED at 14:40:55]
```

OPERATOR SERVICE PROGRAMS

4.4.2 Answering SMOUNT Requests via OPLEAS

When a user gives an SMOUNT command to request a structure that was not found on-line by the system, OPLEAS outputs:

```
[SMOUNT: USER name JOB n LINE y RECEIVED AT date time]
PLEASE MOUNT STRUCTURE str: OR TYPE NO<RET>
structure status messages
AVAILABLE DRIVES:
```

TYPE	UNIT	CHANNEL	STR NAME	PACK #
----	----	-----	-----	-----
list of available drives				

where name is the user's name, n is the user's job number, y is the user's line number, date and time indicate when the request was received, and str is the structure to be mounted. If a privileged user specified an alias for the structure that is different from the physical identification, "(ALIAS x:)" appears after str:, where x is the 1- to 6-character alphanumeric alias specified by the user.

A structure status message is:

```
STRUCTURE BEING IGNORED: structure name
```

The preceding message is repeated for each structure being IGNORED. (See ^ESET STRUCTURE in Appendix A.)

The list of available drives contains those drives that meet one of the following conditions.

1. The drive is off-line.
2. The drive has a nonrecognizable pack on it.
3. The drive is on-line, it has a recognizable pack on it, no user has SMOUNTed it, no user has CONNECTed to it, and no user has a file open on it.

The list gives the type of drive (RP04 or RP06) and the physical unit and channel number of the drive. If the drive is off-line, or if there is no recognizable pack on the drive, OPLEAS outputs NO DETECTABLE PACK ON THIS DRIVE. If the drive is on-line and has a recognizable pack on it, OPLEAS outputs the structure identification of the pack. OPLEAS then outputs the unit number of the pack in the structure and the total number of units in the structure.

If this list changes while an SMOUNT request is pending, OPLEAS outputs the list again. Note that the list changes as you physically mount individual units of a multipack structure or units of a structure that was not requested.

If there are no available drives, the line AVAILABLE DRIVES: and the lines following it are replaced with:

```
NO DRIVES CURRENTLY AVAILABLE FOR MOUNTING
NEW STRUCTURES...
```

OPERATOR SERVICE PROGRAMS

You must answer an SMOUNT request by doing one of the following:

1. Mount all the packs of the structure requested on any of the available drives in the list. OPLEAS will then make the structure known to the system. It will also read the file SYSTEM:OPLEAS.CMD and perform the commands in that file that relate to the requested structure.

Once the structure is known by the system, OPLEAS outputs a message similar to:

```
[STRUCTURE FOR: MOUNTED AS A 2-UNIT RP04 STRUCTURE]
[TRANSACTION FINISHED AT 13:42:07]
```

OPLEAS outputs the preceding message only after you have physically mounted all the packs in the structure.

NOTE

Currently, the only valid command for OPLEAS.CMD is:

DOMESTIC (STRUCTURE) structure:

This command makes a structure DOMESTIC. (See ^ESET STRUCTURE DOMESTIC in Appendix A.)

You can edit SYSTEM:OPLEAS.CMD anytime without having to restart OPLEAS.

2. Cancel the request by typing NO to OPLEAS and then a reason. The reason is output at the user's terminal. OPLEAS then outputs:

```
[TRANSACTION FINISHED AT time]
```

3. Don't do anything if you see the message:

```
[USER ABORTED TRANSACTION AT time]
```

before you can answer the request. In this case, the user has canceled his own request.

----- Hints -----

If you do not respond to an SMOUNT request with some action, OPLEAS will not be able to handle any other requests.

Sometimes you will see a message like:

```
[STRUCTURE DIAG: MOUNTED AS A 1-UNIT RP06 STRUCTURE]
```

without seeing an SMOUNT request. This happens when a user does an SMOUNT for a structure that the system found on-line. This is just an informational message for you; it requires no action.

OPERATOR SERVICE PROGRAMS

----- Example -----

In this example, a user wanted to SMOUNT a structure that was being ignored. The CTY output shows that the request was canceled -- NO was typed to OPLEAS (subjob P). When OPLEAS asked for a reason, STR BEING IGNORED was typed by an operator.

PTYCON>

**** P(5) 13:36:01 ****

[SMOUNT: USER BON JOB 49 LINE 2 RECEIVED AT 8-DEC-76
13:36:01]

PLEASE MOUNT STRUCTURE 4SQM: OR TYPE NO<RET>

STRUCTURE BEING IGNORED: 4SQM

AVAILABLE DRIVES:

TYPE	UNIT	CHANNEL	STR NAME	PACK #
----	----	-----	-----	-----
RP04	1	1	NO DETECTABLE	PACK ON THIS DRIVE

PTYCON> P-NO

PTYCON>

**** P(5) 13:36:36 ****

NO

PLEASE TYPE THE REASON - END WITH <RET>:

PTYCON> P-STR BEING IGNORED

PTYCON>

**** P(5) 13:36:56 ****

STR BEING IGNORED

[TRANSACTION FINISHED AT 13:36:55]

OPERATOR SERVICE PROGRAMS

4.4.3 Answering SREMOVE Requests via OPLEAS

When a user gives a valid SREMOVE command, OPLEAS outputs:

```
[SREMOVE: USER name JOB n LINE y RECEIVED AT date time]
PLEASE REMOVE STRUCTURE str: FROM THE DRIVES WHEN IT APPEARS
ON THE LIST OF FREE DRIVES, OR TYPE NO.
```

where name is the user's name, n is the user's job number, y is the user's line number, date and time indicate when the request was received, and str is the structure to be removed. If a privileged user specified an alias for the structure that was different from the physical identification when the structure was first mounted, "(ALIAS x:)" appears after str:, where x is the 1- to 6-character alphanumeric alias specified by the user.

The above message is then followed by either a list of reasons for not removing the structure or a list of free drives. For example, a list of reasons for not removing the structure is:

```
STRUCTURE 4SQM: CAN'T BE REMOVED WHILE USERS ARE CONNECTED TO IT
STRUCTURE 4SQM: CAN'T BE REMOVED UNTIL USERS CLOSE FILES ON IT AND
DISMOUNT IT
```

If there are some free drives, the output is similar to:

PACKS AVAILABLE FOR REMOVAL AND FREE DRIVES:

TYPE	UNIT	CHANNEL	STR NAME	PACK #
----	----	-----	-----	-----
RP04	2	2	SNARK:	1 OF 1

The list of free drives contains those drives that meet one of the following conditions.

1. The drive is off-line.
2. The drive has a nonrecognizable pack on it.
3. The drive is on-line, it has a recognizable pack on it, no user has SMOUNTed it, no user has CONNECTed to it, and no user has a file open on it.

The list gives the type of drive (RP04 or RP06) and the physical unit and channel number of the drive. If the drive is off-line, or if there is no recognizable pack on the drive, OPLEAS outputs NO DETECTABLE PACK ON THIS DRIVE. If the drive is on-line and has a recognizable pack on it, OPLEAS outputs the structure identification of the pack. OPLEAS then outputs the unit number of the pack in the structure and the total number of units in the structure.

If this list changes while an SREMOVE request is pending, OPLEAS outputs the list again.

OPERATOR SERVICE PROGRAMS

You must answer the SREMOVE request by doing one of the following:

1. If there is a list of reasons for not removing the structure, either answer NO to OPLEAS to cancel the request or send messages to the users of the structure to have them SDISMOUNT the structure. Once all users have SDISMOUNTed the structure, OPLEAS will output a list of free drives, including those of the structure to be removed. You can then complete the SREMOVE by removing all packs of the structure from their drives or by setting off-line at least one drive of the structure. (See Hint below.)

Once you successfully complete the SREMOVE, you will see a message like:

```
[STRUCTURE MOD: REMOVED FROM DRIVES]
[TRANSACTION FINISHED AT 13:31:16]
```

If you had typed NO, you would also have had to type a reason. Then you would have received a message like:

```
[TRANSACTION FINISHED AT 11:15:55]
```

2. If there is a list of free drives and the structure to be removed appears in the list, remove all packs of the structure from their drives, or set at least one drive of the structure off-line. You then receive a message like:

```
[STRUCTURE XYZ: REMOVED FROM DRIVES]
[TRANSACTION FINISHED AT 21:16:20]
```

If the structure to be removed does not appear in the list, type NO and a reason to OPLEAS. Then you receive a message like:

```
[TRANSACTION FINISHED AT 20:20:31]
```

3. Don't do anything if you see the message:

```
[USER ABORTED TRANSACTION AT time]
```

before you can answer the request. In this case, the user has canceled his own request.

OPERATOR SERVICE PROGRAMS

----- Hints -----

If you do not respond to an SREMOVE request with some action, OPLEAS will not be able to handle any other requests.

As with an SMOUNT request, if the list of free drives changes while an SREMOVE request is pending, OPLEAS outputs the list again.

----- Example -----

In this example, the user requested that structure MOD be removed. The SREMOVE request listed MOD, a single unit RP04 structure, as a free drive. Then the operator removed MOD from its drive to satisfy the request.

**** P(5) 13:31:50 ****

[SREMOVE: USER LEE JOB 40 LINE 40 RECEIVED AT 8-DEC-76
13:31:50]

PLEASE REMOVE STRUCTURE MOD: FROM THE DRIVES WHEN IT APPEARS
ON THE LIST OF FREE DRIVES, OR TYPE NO. PACKS AVAILABLE FOR
REMOVAL AND FREE DRIVES:

TYPE	UNIT	CHANNEL	STR NAME	PACK #
----	----	-----	-----	-----
RP04	1	1	MOD:	1 OF 1
RP04	2	2	4SQM:	1 OF 1

[STRUCTURE MOD: REMOVED FROM DRIVES]
[TRANSACTION FINISHED AT 13:31:58]

OPERATOR SERVICE PROGRAMS

4.4.4 Answering TMount Requests via OPLEAS

When a user gives a TMount command, OPLEAS outputs:

```
[TMount: USER name JOB n LINE y RECEIVED AT date time]
MOUNT MAGTAPE: ID=volid/switch
RESPOND WITH DRIVE NAME:
```

where name is the user's name, n is the user's job number, y is the user's line number, date and time indicate when the request was received, volid is the volume identification the user specified, and switch is WRITE-LOCKED or WRITE-ENABLED. If the user did not specify a volid, (SCRATCH) is output for the volid.

You must then type to OPLEAS one of the following:

1. An octal number indicating the number of the magnetic tape drive on which you are going to mount the tape
2. MTAn:, where n is an octal number indicating the number of the magnetic tape drive on which you are going to mount the tape
3. CTRL/Z to abort the user's request

If you type one of the first three above, and you successfully assign a drive, you receive a message similar to:

```
[MTA0: ASSIGNED TO JOB 6]
```

If you do not successfully assign a drive, you receive the message:

```
?DEVICE NOT AVAILABLE - CTRL/Z TO ABORT
```

After you have successfully assigned a drive or aborted a request, OPLEAS outputs:

```
[TRANSACTION FINISHED AT hh:mm:ss]
```

where hh:mm:ss is the time the request was finished.

After the user deassigns the drive or logs off the system, you receive the message:

```
[TMount: DEVICE MTAn: RETURNED]
```

where n is the number of the drive returned.

If you see:

```
[USER ABORTED TRANSACTION AT hh:mm:ss]
```

before you answer the request, do nothing. The user canceled his request.

OPERATOR SERVICE PROGRAMS

----- Example -----

If user SMITH, logged in on line 7 under job 19, requests that a tape with volume identification INPUT be mounted and write-locked, the output on the terminal running OPLEAS as a subjob of PTYCON would be similar to:

**** P(3) 09:52:23 ****

[TMOUNT: USER SMITH JOB 19 LINE 7 RECEIVED AT 17-JUN-76
09:52:22]
MOUNT MAGTAPE: ID=INPUT/WRITE-LOCKED
RESPOND WITH DRIVE NAME:
**** O(4) 09:52:31 ****

Then, if you want to assign MTAl: to the job, type l or MTAl: to OPLEAS (defined as subjob P in this case).

PTYCON> P-MTAl:
PTYCON>
**** P(3) 09:56:02 ****
MTAl:

[MTAl: ASSIGNED TO JOB 19]

[FINISHED AT 09:56:02]
**** O(4) 09:56:07 ****

OPERATOR SERVICE PROGRAMS

4.4.5 Running OPLEAS

To handle PLEASE, SMOUNT, SREMOVE, and TMOUNT requests, you must have OPLEAS running. Normally, commands in the PTYCON.ATO file get OPLEAS started automatically as a PTYCON subjob. However, to start it yourself under a job with OPERATOR or WHEEL capability, type ENABLE and then:

```
    $OPLEAS id
or
    $OPLEAS
    WHAT IS YOUR OPERATOR ID?id
```

where id is an identification for an operator at a certain site.

The CTY or any terminal located next to the DECSYSTEM-20 must run OPLEAS without an id. This lets OPLEAS handle SMOUNT, SREMOVE, and TMOUNT requests, and PLEASE requests that don't specify an operator id. To run OPLEAS without an id, use the second format above and press RETURN for the id. This method is used in PTYCON.ATO.

If you want some PLEASE messages to go to a different terminal, run OPLEAS at that terminal and specify an operator id. Then announce that id to users, so they can send PLEASE messages to that terminal, if they wish, by specifying that operator id in their PLEASE messages.

Currently, only one OPLEAS needs to be running and only one ID is necessary. However, if there were remote stations on the system, each station would run OPLEAS and have a different ID.

Once OPLEAS is running, you can receive messages from users' PLEASE, SMOUNT, SREMOVE, and TMOUNT requests. Then at any time, if you type CTRL/T to OPLEAS, you will get

```
[NUMBER OF USERS WAITING = m]
```

where m is the number of users that have requests pending.

If a fatal error occurs and OPLEAS returns to system command level, you can restart it by typing CONTINUE. OPLEAS then restarts and asks for the ID. For example,

```
CONTINUE
[RESTARTING]

WHAT IS YOUR OPERATOR ID?
```

----- Requirement -----

OPERATOR or WHEEL capability.

OPERATOR SERVICE PROGRAMS

----- Warning Messages -----

%CONTACT LOST.

The current user's copy of PLEASE is no longer running. OPLEAS proceeds to the next user.

%INSUFFICIENT PRIVILEGE. UNABLE TO INCREASE QUOTA.

You do not have sufficient privilege to increase send and receive quotas, because the job doesn't have OPERATOR capability. The default should be adequate to provide normal service, however, regardless of this message. To eliminate the message, you should run OPLEAS under OPERATOR, which should have OPERATOR capability.

%NO CURRENT USER. INPUT IGNORED.

You typed an illegal character in the operator id. Type CTRL/C, run OPLEAS again, and type a different id. Do not use ESCAPE for any part of the id.

%NUMBER OF ONE-WAY MESSAGES EXCEEDS MAXIMUM.

The number of one-way messages has exceeded the maximum (default is 32). One or more users may have sent one-way messages that were not received. SEND a message to all users immediately that their one-way PLEASE messages may have been lost.

%PART OF YOUR MESSAGE WAS NOT TRANSMITTED.

The user exited before all of your text was sent.

%TEXT DELETED FROM INCOMING MESSAGE.

The buffer containing incoming text messages has overflowed. Excess text is lost. Send a message to the user with ^ESEND.

%TEXT EXCEEDS MAXIMUM FOR ONE MESSAGE. MESSAGE BEING SENT.

You typed, without a terminator, more text than can be sent in one message. The first part is sent and reading continues. The user will receive the message in two parts instead of one.

%USER NOT RESPONDING. (TYPE ESCAPE TO PROCEED TO NEXT USER.)

The user has probably exited.

%USER QUEUE OVERFLOW.

The queue of waiting users has exceeded the maximum (default is 32). The excess users are not queued. Using ^ESEND, immediately send a message to all users that the queue for PLEASE messages has overflowed and that their one-way PLEASE messages may have been lost. Also, tell your system manager if this happens frequently.

OPERATOR SERVICE PROGRAMS

----- Error Messages -----

?DEVICE NOT AVAILABLE - <CTRL>Z TO ABORT

Either no magnetic tape drive is available or the drive you specified is not available. Choose a different drive if one is available or abort the request.

?ILLEGAL OPERATOR ID.

The name sent to INFO by OPLEAS is illegal. This probably means that OPLEAS is being run from a directory other than PS:<OPERATOR>, but you may have entered a strange ID.

?INPUT TOO LONG. IT HAS BEEN REJECTED.

You entered an ID that is too long. OPLEAS restarts.

?OPERATOR ID IN USE.

An operator has already signed in with this ID.

?SYSTEM JOBS NOT RUNNING.

An attempt to send the operator ID to INFO failed because INFO is not running. Restart INFO, which is running under SYSJOB.

OPERATOR SERVICE PROGRAMS

4.4.6 Talking to Another User Immediately

If a user has indicated that he needs some help from you to use some system feature, you can help him via the TALK command. Type PUSH to PTYCON and then give the following command, or type the following command to a PTYCON subjob:

```
TALK user
```

or

```
TALK n
```

where n is the number of the user's terminal line.

The command links your terminal and the other user's terminal. Then, whatever text the system would normally print on your terminal or on the linked terminal appears on both terminals. Thus, you can show a user what to type without physically being in the same location.

The linkage affects only the output of the terminals; input works as usual. For example, if the other user's program is awaiting input and you type a command, that command works only for your job, not his. The other user will simply see what you typed.

(See the DECSYSTEM-20 User's Guide for more details on TALK.)

----- Example -----

Just to tell a user that a task that was requested is now complete:

```
@TALK MACK
```

```
LINK FROM OPERATOR, TTY 1
@!UPDATED FORTRAN SOURCES ARE NOW ON <FORLIB>
@!THANKS
@BREAK
```

The ! indicates that a comment follows.

----- Hints -----

The BREAK command breaks any links that you have established with the TALK command and any links that have been made with you by other terminals.

If you talk to a batch job, remember that a ? or any character that the batch job has specified as an error character can cause a batch error.

----- Requirement -----

If the user is set to receive links, which he can do by typing the command RECEIVE LINKS, the default, you can talk to him without being enabled. If he is set to REFUSE LINKS, you must enable before you talk to him.

OPERATOR SERVICE PROGRAMS

4.4.7 Mailing a Message for a User to Read Later

You can send a message to one or more users by doing the following:

1. Type MAIL.
2. After TO: type the names of the users to whom you are mailing the message.
3. After CC: type the names of the users to whom you want copies of the message sent, or simply press RETURN if you don't want copies sent to anyone.
4. After SUBJECT: type a few words to indicate the subject of the message.
5. After the line beginning with MESSAGE, type the message, which can be several lines of text, and end it with ESCAPE or CTRL/Z.

----- Example -----

This example shows how to send a message to user TES. If you are going to do this from the console terminal which is running PTYCON, first connect to a PTYCON subjob or do a PUSH command to PTYCON.

```
@MAIL
TO: TES
CC:
SUBJECT: USER'S GUIDE
MESSAGE (TERMINATE WITH ESC OR CTRL/Z):

WE NOW HAVE MORE COPIES AVAILABLE AT THE COMP CENTER
$
PROCESSING MAIL...
NO ERRORS.
-DONE-
```

If you want to follow TO: or CC: with a list of users, separate their names with commas. You can also specify one indirect file which contains a list of names separated by commas. Just precede the file name with @, but be sure you put it last in the list. For example,

```
TO: SMITH,JONES,@LISTA.USR
```

would send a message to SMITH, JONES, and all the users in the file LISTA.USR. You can use recognition input on the user names and file name.

You can also use one indirect file for the message itself. Precede the file name, which contains the message, with @ and follow it with CTRL/Z or . You can use recognition on the file name.

OPERATOR SERVICE PROGRAMS

----- Example -----

An example showing the use of an indirect file for the message follows.

```
@MAIL
TO: NANCYR
CC: FOLKLORE
SUBJECT: TEST
MESSAGE (TERMINATE WITH ESC OR CTRL/Z):

@A.TST

PROCESSING MAIL...
NO ERRORS.
-DONE-
@
```

Once you have sent the message, any of the users in the TO: or CC: list who are also logged in will be notified immediately that they have a message. If they aren't currently logged in, they will be notified when they do log in. The users must read the message by running RDMAIL. Consequently, the time when the message is actually read is up to the user.

----- Error Messages -----

?ILLEGAL USER NAME - name

The name you typed is not a user name on the system.

(See the DECSYSTEM-20 User's Guide for other messages from MAIL.)

OPERATOR SERVICE PROGRAMS

4.4.8 Reading Your Messages with RDMAIL

If someone sends you a message via MAIL, you are notified, either when you log in or when the message is sent, that you have a message. You should read the message with RDMAIL. To do this:

1. Type PUSH to PTYCON.
2. Run RDMAIL.
3. Press RETURN after DATE AND TIME (/H FOR HELP).
4. Type POP to return to PTYCON.

Once you press RETURN after DATE AND TIME, any messages that you haven't read before are output on your terminal. If you want to read old messages, specify a date and time after DATE and TIME. The format for the date and time is explained when you type /H for HELP, or you can read about it in Section 5.1.9 of this guide.

(The DECSYSTEM-20 User's Guide contains more information on RDMAIL.)

----- Example -----

```
@RDMAIL
DATE AND TIME (/H FOR HELP)
```

```
-----
DATE: 14-JAN-77 15:39
FROM: WELLS
TO: OPERATOR
```

```
-----
SUBJECT: FILES-ONLY DIRECTORY
```

```
WHERE CAN I GET A FORM TO APPLY FOR A FILES-ONLY DIRECTORY?
=====
```

OPERATOR SERVICE PROGRAMS

4.4.9 Sending a Message to Users Immediately

When you need to send a message immediately to all users or to a particular user on the system, use ^ESEND. Do the following:

1. Type PUSH to PTYCON.
2. Type ENABLE.
3. Type ^ESEND terminal number and message. To indicate all terminals, use * for the terminal number.
4. Type DISABLE.
5. Type POP to return to PTYCON.

This allows you to send one line of text, because the message ends when you press RETURN. The message is then immediately output on the terminals of all users on the system.

(Appendix A contains more detail on ^ESEND.)

----- Example -----

```
PTYCON> PUSH
      TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE
$^ESEND * DELETE AND EXPUNGE ALL UNNECESSARY FILES
[FROM OPERATOR: DELETE AND EXPUNGE ALL UNNECESSARY FILES]
$DISABLE
@POP
PTYCON>
```

CHAPTER 5
SOFTWARE TASKS

There are several software tasks involving both system programs and commands that you need to perform. Some of them must be done on a daily basis and in a particular order. Others may be done less frequently or only on request. Your system manager or operations staff should establish a daily schedule, perhaps broken down by operator shifts, and weekly, monthly, or yearly schedules, if appropriate.

Section 5.1 of this chapter contains some tasks that might be included in a daily schedule. Section 5.2 explains those tasks that are generally done on a less frequent schedule and those tasks that are requested.

5.1 DAILY SCHEDULE

The following sections up to Section 5.2 discuss in chronological order possible daily tasks. They are to be done after you ready the system for timesharing (discussed in Chapter 3). You should follow the schedule given to you by your system manager or operations staff to determine when you need to perform a task.

SOFTWARE TASKS

5.1.1 Setting LOGINS-ALLOWED and OPERATOR-IN-ATTENDANCE

When the system is started, you must allow LOGINS on the appropriate terminals and indicate that you are present. Do the following:

1. Type PUSH to PTYCON.
2. Give the INFORMATION (ABOUT) SYSTEM-STATUS command.
3. Use ^ESET LOGINS-ALLOWED if you need to change the set of terminals for LOGINS. Be sure to ENABLE first.
4. Use ^ESET OPERATOR-IN-ATTENDANCE, if necessary, to indicate that you are present. Be sure to ENABLE first.
5. Type POP to return to PTYCON.

You may also need to use this procedure later to change the set of terminals from which LOGINS are allowed, or to indicate that there will not be any operator present. (Details on ^ESET LOGINS-ALLOWED and ^SET OPERATOR-IN-ATTENDANCE are given in Appendix A.)

----- Example -----

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(357)
@INFORMATION (ABOUT) SYSTEM-STATUS
OPERATOR IS NOT IN ATTENDANCE
REMOTE LOGINS ARE NOT ALLOWED
LOCAL LOGINS ALLOWED
PSEUDO-TERMINAL LOGINS ALLOWED
ARPANET TERMINAL LOGINS ALLOWED
CONSOLE TERMINAL LOGIN ALLOWED
ACCOUNTING IS BEING DONE
ACCOUNT VALIDATION IS ENABLED
```

Then to allow LOGINS on all terminals and indicate that an operator is present:

```
@ENABLE
$^ESET LOGINS-ALLOWED (ON) ANY-TERMINAL
$^ESET OPERATOR-IN-ATTENDANCE
$POP
PTYCON>
```

----- Hint -----

You can put the initial ^ESET LOGINS-ALLOWED and ^ESET OPERATOR-IN-ATTENDANCE commands in the file SYSTEM:SYSJOB.RUN. Decide with your system manager what ^ESET commands, if any, need to be in the SYSJOB.RUN file, and when you should manually change a ^ESET parameter. It might be wise to put ^ESET LOGINS-ALLOWED ANY in the SYSJOB.RUN file, but to make the operator on duty do the ^ESET OPERATOR-IN-ATTENDANCE. Thus, if there is no operator on duty, the status is NO OPERATOR-IN-ATTENDANCE. The defaults, before the SYSJOB.RUN file is read, are LOGINS ALLOWED from the CONSOLE TERMINAL and PSEUDO-TERMINALS with NO OPERATOR-IN-ATTENDANCE.

SOFTWARE TASKS

5.1.2 Creating the Message of the Day with MAIL

To send a message to all users of the system, do the following:

1. Enable capabilities.
2. Run MAIL.
3. After the TO: type SYSTEM.
4. After the CC: press RETURN.
5. Give the subject.
6. Type the message.
7. End the message with ESCAPE or CTRL/Z.

If you are going to do this task from the terminal that is running PTYCON, you should first connect to a PTYCON subjob or do a PUSH command to PTYCON.

The message is put into the file MAIL.TXT in PS:<SYSTEM>. Then when a user logs in to the system, he receives on his terminal the messages that he hasn't seen before. Also, as soon as you finish mailing to SYSTEM, all on-line terminals receive the message:

```
[NEW MESSAGE-OF-THE-DAY AVAILABLE]
```

Users already logged in can then read the new message by running RDMAIL with the /M switch.

----- Example -----

```
PTYCON> PUSH
```

```
TOPS-20 COMMAND PROCESSOR 3(357)  
@ENABLE  
$MAIL
```

```
TO: SYSTEM  
CC:  
SUBJECT: CHRISTMAS  
MESSAGE (TERMINATE WITH ESC OR CTRL/Z):
```

```
THE SYSTEM WILL BE UP FOR TIMESHARING ON CHRISTMAS DAY, BUT THERE  
WILL BE NO OPERATOR COVERAGE.
```

```
$  
PROCESSING MAIL...  
NO ERRORS.  
-DONE-  
$POP  
PTYCON>
```

SOFTWARE TASKS

----- Hints -----

Never change the file PS:<SYSTEM>MAIL.TXT with an editor. Always use MAIL.

If you receive a message from SYSJOB, before or while trying to run MAIL, and the message indicates a problem with MAILER or INFO, restart MAILER or INFO (Section 6.8). Then type DIRECTORY MAIL.CPY. If it is not found, type UNDELETE MAIL.CPY. Then do the following:

1. Type GET SYS:MAIL.
2. Type REENTER.
3. After FILE NAME OF MESSAGE FILE:, type MAIL.CPY.
4. After -DONE-, type DISABLE.

----- Example -----

```
$GET SYS:MAIL
$REENTER
```

```
FILE NAME OF MESSAGE FILE:MAIL.CPY
```

```
PROCESSING MAIL...
NO ERRORS.
-DONE-
$DISABLE
@
```

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Messages -----

?COULD NOT SEND TO MAILER

MAILER is hung or not running. Restart it (Section 6.8).

?MAILER DIED, MESSAGES NOT SENT

Restart MAILER (Section 6.8).

PROCESSING MAIL...SYSTEM NOT SENT BECAUSE:
reason

The reason indicates why you couldn't send the mail. Often, the reason is WHEEL OR OPERATOR CAPABILITY REQUIRED. If so, be sure that you are logged in under OPERATOR, which should have OPERATOR capability, and that you have typed ENABLE.

PROCESSING MAIL...SYSTEM NOT SENT QUOTA EXCEEDED

You cannot send the mail, because the directory PS:<SYSTEM> has exceeded its disk storage limit.

SOFTWARE TASKS

5.1.3 Entering Account Validation Data with EDIT

To initially create and later update account validation data, use EDIT. Create or modify account entries as you are directed by your system manager. Your system manager must also tell you the file specification of the base account validation file, if one exists.

Type to PTYCON:

1. CONNECT 0
2. ENABLE
3. CONNECT <directory containing file>
4. EDIT file
5. commands to EDIT to add or modify entries in the file
6. EU
7. CONNECT
8. DISABLE
9. CTRL/X

The base account validation file contains entries for each base account in the system. The format of the entries for each base account is:

```
ACCOUNT name/SUBACCOUNT:file specification
USER user name, user name,...
DIRECTORY structure:<directory>
GROUP (ON STRUCTURE) structure:/USER:user group number
GROUP (ON STRUCTURE) structure:/DIRECTORY:directory group number
```

Part of the format is optional, and some entries can be given more than once.

Each entry can also specify an expiration date with:

```
/EXPIRES:dd-mm-yy hh:mm
```

When you place /EXPIRES after an account name, user name, directory, or group number, the expiration date applies to that item only. When you place /EXPIRES immediately after USER, the expiration date applies to all user names.

SOFTWARE TASKS

The various entries are briefly described below.

ACCOUNT	Specifies the name of the base account.
/SUBACCOUNT:	Specifies the file containing additional data for the base account. The ACCOUNT entry allows only one /SUBACCOUNT:.
USER	Specifies users who are allowed to use the account. An argument of * means all users of the system.
DIRECTORY	Specifies a directory. Anyone with write access to the directory can use the account. A * can be used for the structure or directory to mean all structures or directories.
GROUP	Specifies that the account can be used by certain user or directory groups on a structure.
/USER:	Modifies GROUP and specifies that the account can be used by this user group.
/DIRECTORY:	Modifies GROUP and specifies that the account can be used by this directory group.

----- Example -----

To add a new base account to PS:<ACCOUNTS>ACCOUNTS.TXT:

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(4)]
ENABLE
$CONNECT <ACCOUNTS>
$EDIT ACCOUNTS.TXT
EDIT: ACCOUNTS.TXT.3
*I^!2
00050 ACCOUNT LUMBER/SUBACCOUNT:<FORESTRY>ACCTS.TXT
00070 USER MILLER,JACK,HACKSAW
00090 $
*EU

[ACCOUNTS.TXT.4]
$CONNECT
$DISABLE
@^X
PTYCON>
```

----- Hint -----

Refer to the DECSYSTEM-20 User's Guide for more information on the EDIT program.

SOFTWARE TASKS

5.1.4 Updating the Account Validation Data Base with ACTGEN

After you change account validation data with EDIT or after a project administrator changes a subaccount file, you must run ACTGEN before the new data is effective.

Type to PTYCON:

1. CONNECT 0
2. ENABLE
3. CONNECT PS:<ACCOUNTS>
4. ACTGEN
5. TAKE file specification
Specify the base account validation file used in the previous section.
6. INSTALL
7. EXIT
8. DELETE ACCOUNTS-TABLE.BIN
9. CONNECT
10. DISABLE
11. CTRL/X

----- Example -----

```
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0(5)]
ENABLE
$CONNECT PS:<ACCOUNTS>
$ACTGEN
ACTGEN>TAKE (COMMANDS FROM) ACCOUNTS.TXT
ACTGEN>INSTALL (NEW ACCOUNT VALIDATION DATA BASE)
ACTGEN>EXIT (TO MONITOR)
$DEL ACCOUNTS-TABLE.BIN.*
ACCOUNTS-TABLE.BIN.2 [OK]
$CONNECT
$DISABLE
@^X
PTYCON>
```

----- Requirement -----

OPERATOR or WHEEL capability enabled.

SOFTWARE TASKS

----- Error Messages -----

? ACTGEN: GARBAGE AT END-OF-COMMAND

Press RETURN at the end of a command.

? ACTGEN: INVALID FILE SPECIFICATION, FILE NOT FOUND

The file you specified was not found. Check the directory of the file.

? ACTGEN: NO SUCH ACTGEN COMMAND AS "xxx"

You typed the command "xxx" to ACTGEN, and it wasn't a valid command, or in the file you specified for the TAKE command to ACTGEN, there is an invalid entry beginning with "xxx".

? INCORRECT FIELD: xxx IN ENTRY: aaa
IN FILE: file specification

In the file you specified for the TAKE command to ACTGEN, the field xxx was incorrect in entry aaa. If the field is a file specification, check that the file exists in the appropriate directory.

? WHEEL OR OPERATOR CAPABILITY REQUIRED

You must have WHEEL or OPERATOR capability enabled. Use a job logged in under OPERATOR, which should have OPERATOR capability, and type ENABLE before you run ACTGEN.

SOFTWARE TASKS

5.1.5 Adding, Changing, and Deleting Directories with ^ECREATE

If you need to add a directory or user to the system, change some directory parameters, or delete a directory from the system, use the ^ECREATE command. The details of using ^ECREATE and an explanation for all the directory parameters that you can define with ^ECREATE are in Appendix A. Brief directions are given below.

Adding Directories For Users

To give users the ability to log in to the system, you must create directories for them on PS:, the public structure. Use the name approved by your system manager for the directory name for a user.

If the directory name contains a ".", e.g., <C.SMITH>, the directory will actually be a subdirectory. Before you create a subdirectory, you must first have created its superior directory, in this case <C>. You can determine the superior directory for a subdirectory by using the name of the subdirectory and eliminating the last "." and the characters after it. For example, the superior directory for <AL.BROWN> is <AL>, and the superior directory for <B.BLACK.1> is <B.BLACK>.

To create a directory with default parameters, type to PTYCON:

1. CONNECT O
2. ENABLE
3. ^ECREATE PS:<directory> password
4. to finish
5. DISABLE
6. CTRL/X

NOTE

If you are connected to structure PS: when you are creating a directory to allow a user to log in, you can omit PS: in the ^ECREATE command.

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(4)]
ENABLE
$^ECREATE PS:<NATHANIEL> MATHEW
[NEW]
$$ 
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

To create a directory with some nondefault values, type to PTYCON:

1. CONNECT 0
2. ENABLE
3. ^ECREATE PS:<directory>
4. PASSWORD password
5. Other nondefault parameters and arguments, if any
6. to finish
7. DISABLE
8. CTRL/X

(See Appendix A for ^ECREATE commands to set directory parameters.)

----- Example -----

In this example, assume that subjob 0 is connected to structure PS:
and that <G> already exists and allows subdirectories.

```
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0(5)]
ENABLE
$^ECREATE <G.PLAZA>
[NEW]
$$PASSWORD STACHIA
$$ACCOUNT-DEFAULT TEXTILES
$$WORKING (DISK STORAGE PAGE LIMIT) 900
$$PERMANENT (DISK STORAGE PAGE LIMIT) 600
$$
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

Adding Directories on Mountable Structures

To create a directory which a user can CONNECT to or ACCESS on a structure other than PS:, type to PTYCON:

1. CONNECT O
2. SMOUNT structure
3. ENABLE
4. ^ECREATE structure:<directory>
5. Any nondefault parameters
6. to finish
7. DISABLE
8. SDISMOUNT structure
9. CTRL/X

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(0)]
SMOUNT 4SQM
STRUCTURE 4SQM: MOUNTED
@ENABLE
$^ECREATE 4SQM:<TESTQ>
[NEW]
$$PASSWORD KITS
$$
$DISABLE
@SDISMOUNT 4SQM
STRUCTURE 4SQM: DISMOUNTED
@^X
PTYCON>
```

SOFTWARE TASKS

Adding Files-Only Directories

To create a directory that no one can log in to, but one that will be used only to store files, type to PTYCON:

1. CONNECT O
2. ENABLE
3. ^ECREATE structure:<directory>
4. FILES-ONLY
5. Other nondefault parameters and arguments, if any
6. to finish
7. DISABLE
8. CTRL/X

You can specify structure: in step 3 or omit it to indicate your currently connected structure.

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(1)]
ENABLE
$^ECREATE <FORTRAN-DATA>
[NEW]
$$FILES-ONLY
$$WORKING (DISK STORAGE PAGE LIMIT) 2000
$$PERMANENT (DISK STORAGE PAGE LIMIT) 2000
$$DIRECTORY-GROUP 17
$$
$DISABLE
@^X
PTYCON>
```

----- Hint -----

A password is optional for a FILES-ONLY directory. (See the FILES-ONLY subcommand to ^ECREATE in Appendix A.)

SOFTWARE TASKS

Changing Directories

To simply change a password, type to PTYCON:

1. CONNECT O
2. ENABLE
3. ^ECREATE structure:<directory> new-password
4. DISABLE
5. CTRL/X

You can omit structure: in step 3 if you are connected to the structure containing the directory.

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(4)]
ENABLE
$^ECREATE <MCKIE> PQXY
[OLD]
$$
$DISABLE
@^X
PTYCON>
```

To change other directory parameters, type to PTYCON:

1. CONNECT O
2. ENABLE
3. ^ECREATE structure:<directory>
4. Parameters and new values
5. to finish
6. DISABLE
7. CTRL/X

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(5)]
ENABLE
$^ECREATE QAT:<GOLDSTEIN>
[OLD]
$$IPCF
$$WORKING (DISK STORAGE PAGE LIMIT) 1000
$$
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

Changing Directory Names

To change a directory name: create a temporary directory, rename the user's files into it, list the parameters of the directory that you are changing, and then kill it. Then create a new directory with the correct name and parameters, rename the user's files into it from the temporary directory, and kill the temporary directory.

The procedure for changing a directory name is given below. Structure must be the name of the structure containing the directory you want to change. You can omit steps 3 and 23 if the structure is PS:.

Type to PTYCON:

1. CONNECT 0
2. ENABLE
3. SMOUNT structure:
4. CONNECT structure:
5. ^ECREATE <temporary-directory>
6. FILES-ONLY
7. Other directory parameters; be sure that the disk storage page limits are large enough to accommodate the files from the old directory that you are changing.
8. to finish creating the directory
9. RENAME<old-directory>*. *.* (TO BE) <temporary-directory>*. *.*
10. ^ECREATE <old-directory>
11. LIST
12. KILL
13. to [CONFIRM]
14. to finish killing the directory
15. ^ECREATE <new-directory>
16. Directory parameters output by LIST in step 11
17. to finish creating the directory
18. RENAME<temporary-directory>*. *.* (TO BE) <new-directory>*. *.*
19. ^ECREATE <temporary-directory>
20. KILL
21. to [CONFIRM]
22. to finish killing the directory
23. CONNECT

SOFTWARE TASKS

24. SDISMOUNT structure:
25. DISABLE
26. CTRL/X

----- Example -----

This example shows what must be done to change a directory on TST:
from RINKO to HRINKO.

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(4)]
ENABLE
$SMOUNT TST:
STRUCTURE TST: MOUNTED
$CONNECT TST:
$^ECREATE <TMPDIR>
[NEW]
$$FILES-ONLY
$$WORKING (DISK STORAGE PAGE LIMIT) 500
$$PERMANENT (DISK STORAGE PAGE LIMIT) 500
$$
$RENAME (EXISTING FILE) <RINKO>*.*.* (TO BE) <TMPDIR>*.*.*
  <RINKO>A..2 => <TMPDIR>A..2 [OK]
  <RINKO>SORT.MAC.1 => <TMPDIR>SORT.MAC.1 [OK]
  <RINKO>TEST..1 => <TMPDIR>TEST..1 [OK]
$^ECREATE <RINKO>
[OLD]
$$LIST
  NAME <RINKO>
  PASSWORD HELEN
  WORKING DISK STORAGE PAGE LIMIT 350
  PERMANENT DISK STORAGE PAGE LIMIT 350
  NUMBER OF DIRECTORY 24
  LAST LOGIN 29-AUG-77 16:03:25

$$KILL
[CONFIRM]
$$
$^ECREATE <HRINKO>
[NEW]
$$PASSWORD HELEN
$$WORKING (DISK STORAGE PAGE LIMIT) 350
$$PERMANENT (DISK STORAGE PAGE LIMIT) 350
$$NUMBER (OF DIRECTORY) 24
$$
$RENAME (EXISTING FILE) <TMPDIR>*.*.* (TO BE) <HRINKO>*.*.*
  <TMPDIR>A..2 => <HRINKO>A..2 [OK]
  <TMPDIR>SORT.MAC.1 => <HRINKO>SORT.MAC.1 [OK]
  <TMPDIR>TEST..1 => <HRINKO>TEST..1 [OK]
$^ECREATE <TMPDIR>
[OLD]
$$KILL
[CONFIRM]
$$
$CONNECT
$$DISMOUNT TST:
STRUCTURE TST: DISMOUNTED
$DISABLE
*^X
PTYCON>
```

SOFTWARE TASKS

Deleting User Names or Directories

To delete a user name or directory from the system, type to PTYCON:

1. PUSH
2. ENABLE
3. ^ECREATE structure:<directory>
4. KILL
5. to [CONFIRM]
6. to finish
7. POP

You can omit structure: in step 3 if you are connected to the structure containing the directory.

----- Example -----

```
PTYCON> PUSH
TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE
$^ECREATE BASIC:<HJOHN>
[OLD]
$$KILL
[CONFIRM]
$$
$POP
PTYCON>
```

----- Hints -----

CAUTION: When you kill a directory, you delete the files in that directory. Do not kill a user's directory if the user is logged in, because you will not be able to free his job number until you reload TOPS-20. If you need to log out the user, use the LOGOUT command, and then KILL the directory. If you can't kill a directory, see the KILL subcommand to ^ECREATE in Appendix A.

Explanations for all ^ECREATE parameters and default values are in Appendix A. Error messages for ^ECREATE are also in Appendix A.

Your system manager should have a form that new users can complete to request access to the system. There is a sample form on the next page.

SOFTWARE TASKS

USER ACCOUNT REQUEST

REQUESTOR'S NAME:

DATE:

SUPERVISOR:

NAME OF DIRECTORY:

PASSWORD:

PERMANENT STORAGE ALLOCATION (PAGES):

ACCOUNT:

WORKING STORAGE ALLOCATION (PAGES):

OPTIONAL ATTRIBUTES

NUMBER OF GENERATIONS TO KEEP (DEFAULT IS 1):

STANDARD FILE PROTECTION (DEFAULT IS 777700):

PROTECTION OF DIRECTORY (DEFAULT IS 777700):

DIRECTORY GROUPS:

USER GROUPS:

MAXIMUM SUBDIRECTORIES ALLOWED:

SUBDIRECTORY USER GROUPS ALLOWED:

FILES-ONLY?

CONFIDENTIAL INFORMATION ACCESS CAPABILITY?

MAINTENANCE CAPABILITY?

OPERATOR CAPABILITY?

WHEEL CAPABILITY?

IPCF CAPABILITY?

ENQ-DEQ CAPABILITY?

DO NOT WRITE BELOW THIS LINE

APPROVED BY:

DATE:

IMPLEMENTED BY:

DATE:

DIRECTORY NUMBER ASSIGNED:

SOFTWARE TASKS

5.1.6 Dumping Directory Parameters with DLUSER

Once you add, change, or delete a directory, you should run DLUSER to get a backup copy of the directory parameters defined with ^ECREATE. Also, if your installation allows users to change directory parameters with SET DIRECTORY or create subdirectories with BUILD, you should get this backup copy periodically at a time scheduled by your system manager. The backup copy can be used to restore directory parameters when you are recovering part of the file system (Section 6.5).

The following three sections explain how to do the following:

1. Dump directory parameters for the public structure, PS:, and create a system backup tape. This tape is helpful for restoring directories.
2. Dump directory parameters for structures other than PS:.
3. Use DLUSER.

5.1.6.1 Dumping Directory Parameters for PS: and Creating a System Backup Tape - You should put a backup copy of directory parameters for PS: onto magnetic tape. For ease in restoring the directories after re-creating the file system, you should also have the following critical system programs on the same tape as the directory parameters.

1. PS:<SYSTEM>MONITR.EXE
2. SYSTEM:EXEC.EXE
3. SYS:DLUSER.EXE
4. SYS:DUMPER.EXE
5. All files from PS:<NEW-SYSTEM> and PS:<SYSTEM>
6. All files from PS:<NEW-SUBSYS> and PS:<SUBSYS>

To dump user directories from PS: with DLUSER and put them on magnetic tape along with the files listed above, type CONNECT 0 to PTYCON. Then:

1. Type SUBMIT SYS:SYSTAP.CTL.
2. Wait until SYSTAP.LOG and SYSTAP.LPT are printed on the line printer.
3. Look at the two files. If there are errors, try the SUBMIT command again or notify your system manager.
4. Once the control file runs without error, file the backup tape along with the two listings.

----- Example -----

```
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0(0)]
SUBMIT SYS:SYSTAP
[INP:SYSTAP=/SEQ:2745/TIME:0:05:00]
@^X
PTYCON>
```

SOFTWARE TASKS

5.1.6.2 **Dumping Directory Parameters for Other Structures** - If there are other structures, in addition to PS:, on your system, put a backup copy of the directory parameters for each of those structures into files SYSTEM:str.TXT, where str is the relevant structure name.

For each structure, type to PTYCON:

1. CONNECT O
2. SMOUNT str:
3. ENABLE
4. DLUSER
5. STRUCTURE str:
6. DUMP SYSTEM:str.TXT
7. EXIT
8. SDISMOUNT str:
9. DISABLE
10. CTRL/X

----- Example -----

To get a backup copy of the directory parameters for SNARK:

```
PTYCON> CONNECT (TO SUBJOB) O
[CONNECTED TO SUBJOB O(0)]
SMOUNT SNARK:
STRUCTURE SNARK: MOUNTED
$ENABLE
$DLUSER
DLUSER>STRUCTURE (TO USE) SNARK:
DLUSER>DUMP (TO FILE) PS:<SYSTEM>SNARK.TXT

DONE.
DLUSER>EXIT (TO MONITOR)
$$DISMOUNT (FILE STRUCTURE) SNARK:
STRUCTURE SNARK: DISMOUNTED
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

5.1.6.3 Using DLUSER - The following discussion gives more detail on DLUSER if you want to run it from your terminal.

Once DLUSER is running, it outputs DLUSER> as its prompt. Then, after it finishes a command, it outputs the prompt again. You can type ? after the prompt to get a list of DLUSER commands. While DLUSER is processing a DUMP or LOAD command, you can find out what directory it is currently working on by typing CTRL/A. You will get the message:

WORKING ON DIRECTORY structure:<directory>

The commands to DLUSER are:

1. DUMP (TO FILE) file specification

This dumps directory parameters into a file. The default file is USERS.TXT.

2. EXIT (TO MONITOR)

This causes the DLUSER program to exit.

3. HELP

This outputs a help message summarizing the functions and commands of DLUSER.

4. LOAD (FROM FILE) file specification

This loads directory parameters from the file specified.

5. STRUCTURE (TO USE) structure name:

This specifies the structure to be used for the DUMP or LOAD function. The default is your connected structure.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

SOFTWARE TASKS

----- Error Messages -----

? GROUP BLOCK IS TOO SMALL, ABORTING ...

If this error occurs, notify the person responsible for system software at your installation.

? INVALID COMMAND CONFIRMATION

You pressed a key other than RETURN or LINE FEED after a command.

? INVALID STRUCTURE NAME GIVEN

You specified a structure that is not mounted, or you forgot the colon after the structure name.

? NOT A DLUSER COMMAND

The command that you typed is not a valid DLUSER command.

? UNABLE TO GET FIRST DIRECTORY

There is a problem on the structure for which you are running DLUSER. The file you are dumping will not be complete. Run CHECKD with the CHECK BITTABLE command (Section 6.7) to determine the problems on the structure.

? UNABLE TO GET NEXT DIRECTORY

There is a problem on the structure for which you are running DLUSER. The file you are dumping will not be complete. Run CHECKD with the CHECK BITTABLE command (Section 6.7) to determine the problems on the structure.

? WHEEL OR OPERATOR CAPABILITY REQUIRED

You do not have OPERATOR or WHEEL capability enabled. Log in under OPERATOR, which should have OPERATOR capability. Then type ENABLE.

SOFTWARE TASKS

5.1.7 Getting Information about Directories

To check various directory parameters or to provide your system manager with certain directory information, you can use the ^ECREATE command, the ^EPRINT command, or the ULIST program. The following three sections show what each one can list for you.

If you decide to change any parameters after you have listed them, be sure to run DLUSER (Section 5.1.6) and DUMP directories.

5.1.7.1 Listing Directory Parameters with ^ECREATE - If you expect to change some directory parameters, this method is useful.

To list all the parameters of one directory, use the LIST VERBOSE command to ^ECREATE. To list only nondefaulted parameters for the directory, use the LIST command to ^ECREATE. Type to PTYCON:

1. CONNECT O or PUSH
2. ENABLE
3. ^ECREATE structure:<directory>
4. LIST VERBOSE or LIST
5. ABORT
6. DISABLE
7. CTRL/X or POP (if you did a PUSH)

You can omit structure: in step 3 if you are connected to the structure containing the directory. You can also change some parameters after listing them. (See Appendix A for details on ^ECREATE.)

LIST VERBOSE to ^ECREATE outputs the same information as ^EPRINT directory VERBOSE, and LIST to ^ECREATE is equivalent to ^EPRINT directory. The advantage of using the LIST subcommand to ^ECREATE, instead of ^EPRINT, is that you can immediately give another subcommand to ^ECREATE.

SOFTWARE TASKS

----- Examples -----

1. To list all parameters:

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE
$^ECREATE <HESS>
[OLD]
$$LIST VERBOSE
NAME <HESS>
PASSWORD FRIEND
WORKING DISK STORAGE PAGE LIMIT 800
PERMANENT DISK STORAGE PAGE LIMIT 300
WHEEL
NOT OPERATOR
NOT CONFIDENTIAL INFORMATION ACCESS
NOT MAINTENANCE
NOT IPCF
NOT ENQ-DEQ
NOT FILES-ONLY
NUMBER OF DIRECTORY 330
DEFAULT FILE PROTECTION 777752
ACCOUNT DEFAULT FOR LOGIN 841
PROTECTION OF DIRECTORY 777740
GENERATIONS TO KEEP 1
MAXIMUM SUBDIRECTORIES ALLOWED 0
LAST LOGIN 18-AUG-77 01:40:22
USER GROUPS 1
DIRECTORY GROUPS - NONE SET
SUBDIRECTORY USER GROUPS ALLOWED - NONE SET

$$ABORT
$POP
PTYCON>
```

2. To list nondefaulted parameters:

```
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0(0)]
ENABLE
$^ECREATE (DIRECTORY NAME) ARCH:<MURPHY>
[OLD]
$$LIST
NAME ARCH:<MURPHY>
PASSWORD PAUL
WORKING DISK STORAGE PAGE LIMIT 4000
PERMANENT DISK STORAGE PAGE LIMIT 600
IPCF
NUMBER OF DIRECTORY 20
GENERATIONS TO KEEP 3
LAST LOGIN 19-AUG-77 11:51:30
USER GROUPS 1

$$ABORT
$DISABLE
@^X
PTYCON>
```

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5.1.7.2 Listing Directory Parameters with ^EPRINT - To list all the parameters of one directory, use the ^EPRINT command with the VERBOSE subcommand. To list only nondefaulted parameters, use ^EPRINT with no subcommands. Type to PTYCON:

1. CONNECT O or PUSH
2. ENABLE
3. ^EPRINT structure:<directory>,
VERBOSE
RET

or

^EPRINT structure:<directory>
4. CTRL/X or POP (if you did a PUSH)

You can omit structure: in step 3 if you are connected to the structure containing the directory.

After you get the list of parameters with ^EPRINT, you must then use ^ECREATE to change any of them. (More details on ^ECREATE and ^EPRINT are in Appendix A.)

SOFTWARE TASKS

----- Examples -----

1. To list the nondefaulted parameters of a directory:

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE
$^EPRINT <N.ROSEN>
NAME PS:<N.ROSEN>
PASSWORD ABE
WORKING DISK STORAGE PAGE LIMIT 1000
PERMANENT DISK STORAGE PAGE LIMIT 150
NUMBER OF DIRECTORY 344
ACCOUNT DEFAULT FOR LOGIN LANGUAGES
LAST LOGIN 26-AUG-77 06:19:11

$POP
```

2. To list all the parameters of a directory:

```
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0(0)]
ENABLE
$^EPRINT <MILLER>,
$$VERBOSE
$$ (RET)
NAME PS:<MILLER>
PASSWORD MITCH
WORKING DISK STORAGE PAGE LIMIT 1000
PERMANENT DISK STORAGE PAGE LIMIT 600
NOT WHEEL
NOT OPERATOR
CONFIDENTIAL INFORMATION ACCESS
NOT MAINTENANCE
NOT IPCF
NOT ENQ-DEQ
NOT FILES-ONLY
NUMBER OF DIRECTORY 104
DEFAULT FILE PROTECTION 777752
ACCOUNT DEFAULT FOR LOGIN - NONE SET
PROTECTION OF DIRECTORY 777740
GENERATIONS TO KEEP 1
MAXIMUM SUBDIRECTORIES ALLOWED 2
LAST LOGIN 19-AUG-77 10:44:05
USER GROUPS 1, 2, 3
DIRECTORY GROUPS 2
SUBDIRECTORY USER GROUPS ALLOWED 3

$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

5.1.7.3 **Listing Directory Parameters with ULIST** - The ULIST program can give you four types of listings.

1. An alphabetic list of all directories on a structure, with passwords, if desired, and all the directory parameters
2. A numeric list of directories on a structure according to directory numbers, with passwords, if desired, and all the directory parameters
3. A mini-listing containing only directory numbers and names on a structure
4. A directory group listing giving groups used, highest directory in use, first free directory, the directories in each group, the users having access to each group, the users with special capabilities, and directories that are files-only.

To run ULIST, you must have OPERATOR or WHEEL capability, but you do not need to enable. Connect to a PTYCON subjob and type:

1. ULIST
2. ULIST commands, separated by `(RET)`, to select the desired type and format of listing
3. BEGIN to start the listing
4. EXIT to return to TOPS-20 command level

When ULIST is running, it prompts with ULIST> for each command. Follow each command with `(RET)`. To see the commands to ULIST, type HELP as the command. For example,

```
@ULIST
ULIST>HELP
```

COMMANDS ARE:

```
ALPHABETIC (LIST OF USERS)
BEGIN (LISTING) [STARTS OUTPUTTING THE LISTING]
DIRECTORY (GROUP LISTING)
EXIT (TO MONITOR)
HELP
INCLUDE (PASSWORDS IN LISTING)
MINI (LISTING FORMAT) [NAME & DIRECTORY NUMBER ONLY]
NARROW (PAPER FORMAT)
NUMERIC (LIST OF USERS)
OMIT (PASSWORDS FROM LISTING)
OUTPUT (TO FILE) FILE-SPEC
PRINT (LISTING ON PRINTER)
STRUCTURE (TO USE) STR-NAME
WIDE (PAPER FORMAT)
```

ASSUMED ARE: NUMERIC, WIDE, OMIT, AND OUTPUT TO TTY:

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The different types of lists are obtained with the commands ALPHABETIC, NUMERIC, MINI, and DIRECTORY. These commands correspond to the explanations at the beginning of this section. If you do not specify the type of list, NUMERIC is assumed. Each of these commands produces a different listing.

If you want to include passwords in the alphabetic or numeric listing, give the command INCLUDE, because OMIT is the default.

If you want the output on narrow paper (80 columns), give the NARROW command, because WIDE (132 columns) is the default.

The listing will be output on your terminal, because output to TTY: is the default, unless you give the OUTPUT or PRINT command. The PRINT command will give you a listing on the line printer. OUTPUT followed by a file specification will put the listing into the file given. The default file for the OUTPUT command is USERS.TXT.

----- Examples -----

1. To produce a numeric list of directories on structure SNARK on the printer with narrow paper and without passwords:

```
@ULIST
ULIST>PRINT
ULIST>STRUCTURE SNARK:
ULIST>NARROW
ULIST>BEGIN
DONE

ULIST>EXIT
@
```

There may be a time lag before and after DONE is output.

The line printer listing starts as follows:

```
NAME,ACCOUNT      (STRUCTURE: SNARK)      WED 31-AUG-77      PAGE 1
DIR-#  PRIVILEGES  LOGIN-QUOTA  LOGOUT-QUOTA  USER-GROUPS  DIR-GROUPS
(  MODES      DEF-FILE-PRO  DIR-PROT  DEF-FILE-RET )

SNARK:<ROOT-DIRECTORY>
   1              0              4700              4700
(600000000000 500000777700 500000777700              1 )
SNARK:<SYSTEM>
   2              0              7000              7000
(600000000000 500000777752 500000777740              0 )
SNARK:<SUBSYS>
   3              0              10000             4800              1
(600000000000 500000777752 500000770000              1 )
SNARK:<ACCOUNTS>
   4              0              10000            10000
(600000000000 500000777700 500000777700              0 )
SNARK:<OPERATOR>,390
   5            300000              2000              2000      2479,2480
SNARK:<SPOOL>
   6              0              2000              150
(600000000000 500000777700 500000777777              0 )
SNARK:<TES>,QA
  20              0              250              250              5,4,7              2,4
(200000000000 500000777700 500000777740              1 )
```

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Thus, the listing is in ascending order according to directory number. The line beginning and ending with parentheses is omitted if the values for the parameters in that line are system defaults.

For each directory the following are given.

NAME

This is the directory name.

ACCOUNT

This is the default account for a user logging into the directory.

DIR-#

This is the number of the directory.

PRIVILEGES

This is the right half of the capability word (bits 18-35).
Bit 18=1 allows WHEEL capability
Bit 19=1 allows OPERATOR capability
Bit 20=1 allows CONFIDENTIAL INFORMATION ACCESS capability
Bit 21=1 allows MAINTENANCE capability
Bit 22=1 allows IPCF capability
Bit 23=1 allows ENQ-DEQ capability
Bit 24=1 allows ARPANET-WIZARD capability
Bit 25=1 allows ABSOLUTE-ARPANET-SOCKETS capability

LOGIN-QUOTA

This is the number of pages for working disk storage page limit.

LOGOUT-QUOTA

This is the number of pages for permanent disk storage page limit.

USER-GROUPS

This indicates which user groups the user belongs to.

DIR-GROUPS

This indicates which directory groups this directory is in.

MODES

This is the mode word of the directory (bits 0 to 35).

Bit 0=1 allows a FILES-ONLY directory
Bit 1=1 allows ALPHANUMERIC ACCOUNTS
Bit 2=1 allows REPEATED LOGIN MESSAGES

DEF-FILE-PRO

This is the default file protection. Only the rightmost six octal digits are significant.

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DIR-PROT

This is the default protection for the directory. Only the rightmost six octal digits are significant.

DEF-FILE-RET

This is the default number of generations of a file to keep.

(See the ^ECREATE command in Appendix A for more detail on the above parameters.)

2. To produce an alphabetic list of directories on structure SNARK on your terminal, with passwords and on narrow paper:

```
@ULIST
```

```
ULIST>NARROW (PAPER FORMAT)
```

```
ULIST>STRUCTURE (TO USE) SNARK:
```

```
ULIST>INCLUDE (PASSWORDS IN LISTING)
```

```
ULIST>ALPHABETIC (LIST OF USERS)
```

```
ULIST>BEGIN
```

```
DONE
```

```
^LNAME,PASSWORD,ACCOUNT (STRUCTURE: SNARK)          WED 7-SEP-77    PAGE 1
DIR-#  PRIVILEGES  LOGIN-QUOTA LOGOUT-QUOTA USER-GROUPS DIR-GROUPS
(  MODES      DEF-FILE-PRO  DIR-PROT  DEF-FILE-RET )
```

```
SNARK:<LA>,,TEST
```

```
65          0          250          250
```

```
SNARK:<BEN>,HUNTER
```

```
611      400000      2500      2000
```

```
(600000000000 500000777752 500000777740          1 )
```

```
SNARK:<FIELD-IMAGE>,
```

```
315          0          2000          250          1
```

```
(600000000000 500000777752 500000777740          1 )
```

```
⋮
```

The output is alphabetical by directory name. The information for each directory is identical to that in a numeric list. In this example, however, INCLUDE (PASSWORDS IN LISTING) was specified. Thus, each directory name is followed by a comma and password, if one exists. The line beginning and ending with parentheses is omitted if the values for the parameters in that line are system defaults.

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3. To get a mini-listing on your terminal on narrow paper of the directories on the public structure:

```
@ULIST
ULIST>MINI
ULIST>NARROW
ULIST>BEGIN
DONE
```

```
List of structure: PS          WEDNESDAY, 7 SEPTEMBER 77

1 PS:<ROOT-DIRECTORY>          71 PS:<DOC-LANGUAGE>
2 PS:<SYSTEM>                  72 PS:<FITZY>
3 PS:<SUBSYS>                  73 PS:<BONSAVAGE.A>
4 PS:<ACCOUNTS>               74 PS:<MAINTENANCE>
5 PS:<OPERATOR>              75 PS:<TWAITS>
6 PS:<SPOOL>                  76 PS:<DIPACE.1>
7                               77 PS:<CALABI>
10                              100 PS:<SKOGLUND>
11                              101 PS:<2BOSACK>
12                              102 PS:<BEERS>
13                              103 PS:<LEACHE>
14                              104 PS:<MILLER>
15                              105 PS:<ESTEY>
16                              106 PS:<BERKOWITZ>
17                              107 PS:<FREE4>
20 PS:<FINER>                 110 PS:<VANDERHOOF>
```

The output is given in order of directory numbers, going down the page in columns. Each entry has directory number and structure name:directory name, which may be blank if no directory has been created for that number.

4. To get a directory group listing for the public structure on your terminal on narrow paper:

```
@ULIST
ULIST>DIRECTORY
ULIST>NARROW
ULIST>BEGIN
DONE
```

USER AND DIRECTORY GROUPS ON STRUCTURE: PS

WEDNESDAY, 7 SEPTEMBER 77

THE FOLLOWING GROUPS ARE IN USE:

1 2 3 2393

THE HIGHEST DIRECTORY IN USE IS NUMBER: 605

THE FIRST FREE DIRECTORY NUMBER IS: 60

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THE FOLLOWING DIRECTORIES ARE IN GROUP 1

PS:<1FIELD-IMAGE>, PS:<1HURLEY>, PS:<1KIRSCHEN>, PS:<1MILLER>,
PS:<1MONITOR>, PS:<1SOURCES>

THE FOLLOWING USERS HAVE ACCESS TO GROUP 1

PS:<BOSACK>, PS:<HALL>, PS:<HELLIWELL>, PS:<HESS>, PS:<HURLEY>,
PS:<KIRSCHEN>

THE FOLLOWING DIRECTORIES ARE IN GROUP 2

PS:<ABEL>, PS:<EXERCISER>

THE FOLLOWING USERS HAVE ACCESS TO GROUP 2

PS:<ALUSIC>

.
.
.

The following users are WHEELS:

PS:<HALL>, PS:<HURLEY>, PS:<KIRSCHEN>, PS:<MCLEAN>, PS:<MILLER>,
PS:<SNYDER>

The following users are OPERATORS:

PS:<OPERATOR>

The following users have CONFIDENTIAL INFORMATION ACCESS:

PS:<MCLEAN>

The following directories are FILES-ONLY:

PS:<1-UTILITIES>, PS:<1A-EXEC>, PS:<1A-MONITOR>, PS:<1A-UTILITIES>,
PS:<ROOT-DIRECTORY>, PS:<SPOOL>, PS:<SUBSYS>, PS:<SYSTEM>,
PS:<V-SOURCES>

.
.
.

ULIST>EXIT

@

SOFTWARE TASKS

----- Hints -----

You will know if a privileged user runs ULIST and includes passwords, because the following message will be output on the CTY.

* * * ULIST WITH PASSWORDS BY name JOB number

Check the name. If it is someone that should not have access to users' passwords, try to find the listing immediately and destroy it. Also, notify the system manager and investigate why that person was able to access this confidential information.

You should always be careful about where you leave ULIST output, because it might contain users' passwords.

ULIST starts looking for free directory numbers at 20 (octal), because 1 to 17 (octal) are reserved.

----- Requirement -----

OPERATOR or WHEEL capability.

----- Error Messages -----

? INVALID STRUCTURE NAME GIVEN

You specified a structure that is not mounted or you omitted the colon after the structure name.

? ULIST: CANNOT OPEN SPECIFIED FILE

The file access protection is such that you can't write into the file.

? ULIST: GARBAGE AT END-OF-COMMAND

You typed an illegal character within the command or at the end of the command.

? ULIST: INVALID FILE SPECIFICATION

The file specification that you typed is not valid.

? ULIST: NO SUCH ULIST COMMAND AS "command typed"

You typed something that is not a ULIST command. Type H after the prompt ULIST> to get a list of commands.

? ULIST: NOT PRIVILEGED TO READ SYSTEM FILES

You need OPERATOR or WHEEL capability to read the directory information.

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5.1.8 Checking System Status

While the system is running, you may have to check on the status of certain jobs, devices, or system statistics. The following three sections discuss various ways of doing these tasks.

5.1.8.1 Determining the Status of Jobs with SYSTAT - To get a summary of the jobs being used on the system, use the SYSTAT command. It will tell you the job number, the terminal line number connected to that job, the program being run, and the user. The SYSTAT command can also be followed by an argument to get a more detailed summary or a specific part of the summary. For example,

```
@SYSTAT n
```

where n is a job number, prints out information for job n only. Also

```
@SYSTAT user
```

where user is a user's name, prints out information for the jobs logged in by that user only. (See the DECSYSTEM-20 User's Guide for more details on SYSTAT.)

----- Examples -----

1. To get a summary of all jobs, type PUSH to PTYCON and then type SYSTAT.

```
@SYSTAT
MON 19-JAN-76 14:56:21 UP 5:42:10
21+6 JOBS  LOAD AV  3.43  3.72  4.26

JOB  LINE PROGRAM  USER
  2   13  MCO      HALL
  5   25  QUENCH   COHEN
  9   11  TV       PORCHER
 10   27  EXEC     CLARK
 11   56  FILCOM   KOHLBRENNER
 12   55  TV       EIBEN
 14   61  EXEC     FECZKO
 15    6  EXEC     POMMER
 16   14  EXEC     MILLER
 17   72  EXEC     BROWNE
 18   67  EXEC     1STUDENT
 19   24  EXEC     HURLEY
 20   22  DUMPER   MURPHY
 22  110  MACRO    MURPHY
 23   44  MACRO    DCAMPBELL
 24   63  EXEC     2STUDENT
 25   23  EXEC     MCKIE
 26   64  EXEC     3STUDENT
 27   70  EXEC     YEASTED
 28   20  EXEC     BONSAVAGE
 29   62  EXEC     LIEMAN

  1  101  PTYCON   OPERATOR
 3* 106  EXEC     OPERATOR
  4  107  DUMPER   OPERATOR
  6  105  OPLEAS   OPERATOR
  7  103  LPTSPL   OPERATOR
  8  104  BATCON   OPERATOR

@
```

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2. To get a SYSTAT of job 10, type PUSH to PTYCON and SYSTAT 10.

```
@SYSTAT 10
  10    27 EXEC    CLARK
```

3. To find out what jobs are running under OPERATOR, type PUSH to PTYCON and SYSTAT OPERATOR.

```
@SYSTAT OPERATOR
  0  DET  SYSJOB OPERATOR
  1  101  PTYCON OPERATOR
  4  107  DUMPER OPERATOR
  6  105  OPLEAS OPERATOR
  7  103  LPTSPL OPERATOR
  8  104  BATCON OPERATOR
```

@

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5.1.8.2 Periodically Watching System and Job Statistics with WATCH -
The WATCH program allows you to periodically output TOPS-20 monitor statistics and/or a job summary. Under any job, type the following:

1. WATCH
2. After OUTPUT TO FILE:, the name of the file to contain the output; it can be TTY: if you want the output on your terminal. If you type /H after OUTPUT TO FILE:, you will get an explanation of the WATCH output and another prompt for the output file.
3. YES or NO to the questions PRINT MONITOR STATISTICS and PRINT JOB SUMMARY. If you answer NO to both questions, you will get the output for load averages only.
4. mm:ss or mm (where mm is the number of minutes and ss the number of seconds) to specify a fixed time period; press RETURN for a variable time period. Type ? for a help text on time periods. If you requested a variable time period, you must press RETURN again whenever you want more output. Statistics are gathered over every fixed or variable time period and then output.

NOTE

The length of the time period actually used may not be exactly what you specified, because the outputting of information may delay the next sampling period. Do not make the time period too small, because WATCH itself will use too much time. A time period of two minutes is reasonable.

To stop WATCH, type two CTRL/Cs. Then, if your output was to a disk file, you can PRINT it on the line printer.

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The abbreviations used in the output and their meanings are given below.

USED

The percentage of processor time spent in user computations in the last time interval. A sum of runtimes kept by the scheduler is used in the calculation.

IDLE

The percentage of processor time with no requests for service in the last time interval.

SWPW

The percentage of processor time spent in a SWAP WAIT, waiting for pages, in the last time interval.

SKED

The percentage of processor time spent scheduling.

NOTE

USED+IDLE+SWPW+SKED should equal 100%, within rounding error.

SUSE

The percentage of processor time spent in user computations in the last interval. The sum of the runtimes of individual jobs is used in the calculation.

NCOR

The number of global core management cycles (number of core garbage collect cycles) that occurred during the last time interval.

AJBL

The number of forced calls to adjust the balance set.

NREM

The number of runnable processes pre-empted from the balance set in the last interval.

TRAP

The percentage of processor time spent in pager traps during the last interval.

NRUN

The average number of runnable processes during the last interval.

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NBAL

The average number of processes in the balance set during the last interval, i.e., the average number of runnable processes loaded into core.

BSWT

The average number of processes in a wait state in the balance set during the last interval.

DSKR

The percentage of processes in BSWT waiting for disk reads.

DSKW

The percentage of processes in BSWT waiting for disk writes.

SWPR

The percentage of processes in BSWT waiting for swapping.

DMRD

The number of drum pages read during the last interval.

DMWR

The number of drum pages written during the last interval.

DKRD

The number of disk pages read during the last interval.

DKWR

The number of disk pages written during the last interval.

TTIN

The number of characters input on terminals during the last time interval.

TTOU

The number of characters output on terminals during the last time interval.

WAKE

The number of process wakeups during the last time interval.

TTCC

The number of terminal interrupts during the last time interval.

FPGS

The average number of free pages, i.e., pages on the replaceable queue.

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----- Example -----

This example shows the output for one time period of two minutes. Note that you must type CTRL/C to exit from WATCH. Otherwise, for this example, WATCH would output a report every two minutes.

@WATCH

WATCH 3(6), /H FOR HELP.
OUTPUT TO FILE: /H

ALL DATA IS FOR LAST INTERVAL ONLY.

USED: USED TIME AS PERCENTAGE
IDLE: IDLE TIME AS PERCENTAGE
SWPW: SWAP-WAIT TIME AS PERCENTAGE
SKED: SCHEDULER OVERHEAD TIME AS PERCENTAGE
SUSE: SUM OF JOB RUNTIMES AS PERCENTAGE
NCOR: NUMBER OF GCCOR'S (GARBAGE-COLLECT CORE)
AJBL: NUMBER OF FORCED CALLS TO AJBALS (ADJUST BALANCE SET)
NREM: COUNT OF FORCED PROCESS REMOVALS
TRAP: PAGER TRAP SERVICE TIME PERCENTAGE (COUNTS IN USED ALSO)
NRUN: AVERAGE NUMBER RUNNABLE FORKS DURING INTERVAL
NBAL: AVERAGE NUMBER FORKS IN BALANCE SET DURING INTERVAL
BSWT: AVERAGE NUMBER BALANCE SET FORKS WAITING DURING INTERVAL
DSKR: PERCENT OF BALANCE SET WAITS ATTRIBUTABLE TO DSK READS
DSKW: PERCENT OF BALANCE SET WAITS ATTRIBUTABLE TO DSK WRITES
SWPR: PERCENT OF BALANCE SET WAITS ATTRIBUTABLE TO SWAP READS
UPGS: AVERAGE NUMBER OF PAGES IN THE BALANCE SET (SUM OF WORKING SET SIZES)
DMRD: NUMBER OF DRUM READS
DMWR: NUMBER OF DRUM WRITES
DKRD: NUMBER OF DISK READS
DKWR: NUMBER OF DISK WRITES
TTIN: NUMBER OF TERMINAL INPUT CHARACTERS
TTOU: NUMBER OF TERMINAL OUTPUT CHARACTERS
WAKE: NUMBER OF PROCESS WAKEUPS
TTCC: NUMBER OF TERMINAL INTERRUPTS
FPGS: AVERAGE NUMBER OF FREE PAGES (PAGES ON REPLACEABLE QUEUE)

QUEUE DISTRIBUTION PERCENTAGE: FRACTION OF "USED" TIME USED ON EACH SCHEDULER QUEUE.
LOAD AVERAGES: EXPONENTIAL AVERAGE OF NUMBER OF RUNNABLE FORKS WITH TIME CONSTANTS OF 1, 5, AND 15 MINUTES.
HIGH QUEUE AVERAGES: COMPONENT OF LOAD AVERAGE DUE TO FORKS ON INTERACTIVE QUEUES.
LOW QUEUE AVERAGES: COMPONENTS OF LOAD AVERAGE DUE TO FORKS ON COMPUTE QUEUE.

RUN TIME: TOTAL ACCUMULATED RUN TIME OF JOB (ALL FORKS) AS HH:MM:SS.
DELTA RT: JOB RUNTIME IN LAST INTERVAL
%: JOB RUNTIME AS PERCENTAGE OF "USED"

SOFTWARE TASKS

OUTPUT TO FILE: TTY:
 PRINT MONITOR STATISTICS? Y
 PRINT JOB SUMMARY ? Y

TIME PERIOD (MM:SS): 2:00

WATCH IN OPERATION --

WATCH SUMMARY AT 15-SEP-77 16:41:46
 FOR AN INTERVAL OF 0:00:15 WITH 40 ACTIVE JOBS.

USED: 73.7 IDLE: 0.0 SWPW: 9.9 SKED: 16.4
 SUSE: 73.5 NCOR: 2 AJBL: 111 NREM: 0
 TRAP: 6.4 NRUN: 6.8 NBAL: 6.4 BSWT: 1.8
 DSKR: 50.5 DSKW: 19.6 SWPR: 28.0 UPGS: 431.
 DMRD: 55 DMWR: 304 DKRD: 253 DKWR: 154
 TTIN: 98 TTOU: 2213 WAKE: 160 TTCC: 1
 FPGS: 353.
 QUEUE DISTRIBUTION PERCENTAGE: 28.28 16.23 1.25 26.42

LOAD AVERAGES: 6.43 6.72 6.09
 HIGH QUEUE AVERAGES: 4.47 4.46 3.84
 LOW QUEUE AVERAGES: 1.96 2.26 2.24

JOB	TTY	PROGRAM	RUN TIME	DELTA RT	%	USER
5	120	EXEC	0:01:06	2.59	17.20%	NIXON
2	23	MACRO	0:02:18	1.39	9.24%	LCAMPBELL
10	117	CREF	0:02:50	1.24	8.25%	CHEN
40	124	WATCH	0:00:02	1.08	7.18%	BONSAVAGE
14	35	EXEC	0:00:39	0.94	6.25%	POMMER
9	60	PASREQ	0:00:41	0.88	5.85%	TOTTON
30	113	EXEC	0:00:05	0.70	4.67%	OTOOLE
18	DET	PERF	0:00:19	0.31	2.08%	OPERATOR
0	DET	SYSJOB	0:00:29	0.26	1.70%	OPERATOR
32	47	PTYCON	0:00:16	0.21	1.37%	GUNN
12	21	SRT1	0:00:15	0.21	1.37%	FRIES
8	40	TV	0:00:46	0.19	1.28%	BERKOWITZ
22	212	LPTSPL	0:00:06	0.19	1.28%	OPERATOR
38	3	EXEC	0:00:01	0.16	1.09%	OPERATOR
3	76	MAIL	0:00:14	0.12	0.82%	MURPHY
7	221	D60SPL	0:00:13	0.10	0.66%	OPERATOR
13	12	TV2	0:00:17	0.09	0.62%	RANDALL
31	222	D60SPL	0:00:07	0.09	0.58%	OPERATOR
37	225	NEW-DY	0:00:05	0.03	0.23%	GUNN
19	211	SPRINT	0:00:05	0.03	0.19%	OPERATOR
1	205	PTYCON	0:00:44	0.02	0.14%	OPERATOR
24	214	BATCON	0:00:05	0.02	0.14%	OPERATOR
29	215	BATCON	0:00:02	0.02	0.12%	OPERATOR

^C
 @

SOFTWARE TASKS

5.1.8.3 **Getting Other Information** - The system command INFORMATION (ABOUT) has several different arguments to give you information on various system and job parameters. The arguments useful for you, as an operator, are given here; others are in the DECSYSTEM-20 User's Guide.

ARGUMENT	OUTPUT
AVAILABLE DEVICES	List of mounted structures and unused system devices
AVAILABLE LINES	List of unused terminal lines
BATCH-REQUESTS	List of jobs in the batch queue
DIRECTORY	Directory parameters and their values
LOGICAL-NAMES (OF) SYSTEM	System logical names
MONITOR-STATISTICS	List of monitor and system performance statistics
NETWORK-STATUS	ARPANET status and IMP status (See the <u>TOPS-20AN User's Guide</u> .)
OUTPUT-REQUESTS	List of jobs in the line printer output queue
STRUCTURE name:	Mount count, open file count, number of units, status and users of the structure name specified (* for the name gives information on all mounted structures)
SUBSYSTEM-STATISTICS	Name of subsystems, their total runtime, number of page defaults per second they cause, their size in blocks, and their working-set size in pages
SYSTEM-STATUS	whether or not the operator is in attendance, what terminals are allowed for LOGIN, if accounting entries are being made, and if account validation is being done
TAPE-PARAMETERS	Current default tape density, parity, format, and record length
VERSION	System name and date installed, version of the command language (the EXEC), name and version of program in memory

SOFTWARE TASKS

----- Examples -----

```
@INFORMATION (ABOUT) SYSTEM-STATUS
OPERATOR IS NOT IN ATTENDANCE
REMOTE LOGINS ALLOWED
LOCAL LOGINS ALLOWED
PSEUDO-TERMINAL LOGINS ALLOWED
ARPANET TERMINAL LOGINS ALLOWED
CONSOLE TERMINAL LOGIN ALLOWED
ACCOUNTING IS BEING DONE
ACCOUNT VALIDATION IS ENABLED
@INFORMATION (ABOUT) STRUCTURE (NAME) SNARK:
STATUS OF STRUCTURE SNARK:
MOUNT COUNT: 1, OPEN FILE COUNT: 0, UNITS IN STRUCTURE: 1
DOMESTIC
USERS WHO HAVE SMOUNTED SNARK: HESS
USERS ACCESSING SNARK: HESS
NO USERS CONNECTED TO SNARK:
@
```

SOFTWARE TASKS

5.1.9 Listing User Remarks with RDMAIL

To list users' comments that have been mailed to REMARKS:

1. Enable capabilities.
2. Run RDMAIL.
3. Type Y to SPECIAL USER.
4. Type REMARKS to USER NAME.
5. Press RETURN to DATE AND TIME.
6. Disable capabilities.

All other remarks which haven't been read before from PS:<REMARKS>MAIL.TXT will be output on your terminal.

NOTE

If some other privileged user has run RDMAIL on PS:<REMARKS> before you, for step 5 above type the date and time you last did this task.

----- Example -----

```
@ENABLE
$RDMAIL

SPECIAL USER (Y OR N)? Y

USER NAME: REMARKS
DATE AND TIME (/H FOR HELP)
.
.
.
$DISABLE
```

The comments output on your terminal should be distributed and answered according to a method established by your system manager.

Sometimes you may need to perform other functions with RDMAIL. If you need to read all the remarks from PS:<REMARKS>MAIL.TXT, even those that you've listed before, type /A after DATE AND TIME. If you need to read only those remarks created after a certain date and time, type after DATE AND TIME:

```
mmm dd,yyyy hh:mm
```

where:

mmm = the first three letters of the month

dd = the number for the day of the month

yyyy = the year

hh:mm = hour:minute (equal to 00:01 if omitted after the date)

Other date formats may be accepted, but they are not recommended.

SOFTWARE TASKS

To list the headings but not the text part of the remarks, type date and time, and then /P. For example,

```
@ENABLE
$RDMAIL
```

```
SPECIAL USER (Y OR N)? Y
```

```
USER NAME: REMARKS
DATE AND TIME (/H FOR HELP) SEP 20,1975/P
```

```
-----
DATE: 20-SEP-75 20:39
FROM: MCKIE
TO: HELLIWELL
CC: LEWINE,WERME,HESS,REMARKS
```

```
SUBJECT: The EXEC's printing of EDIT files.
```

```
-----
DATE: 22-SEP-75 10:23
FROM: OSMAN
TO: MILLER,REMARKS,OSMAN
```

```
SUBJECT: ALLOWING USERS TO STOP SPENDING MONEY ....
```

```
-----
$DISABLE
```

To list remarks and pause between each one, type date and time followed by /S. You will be asked to press RETURN to get the next remark. You can stop with CTRL/C.

To get help with RDMAIL, type /H after DATE AND TIME. For example,

```
@ENABLE
$RDMAIL
```

```
SPECIAL USER (Y OR N)? Y
```

```
USER NAME: REMARKS
DATE AND TIME (/H FOR HELP) /H
```

```
TYPE IN A DATE AND TIME IN TOPS-20 FORMAT AS FOLLOWS:
```

```
MMM DD,YYYY HH:MM
```

```
OR
```

```
MMM DD,YYYY
```

```
THE LATTER CASE WILL ASSUME TIME 00:01.
(FOR EXAMPLE, A VALID DATE AND TIME IS MAR 16,1976 15:30)
```

```
OR TYPE AN EMPTY LINE AND GET ALL MESSAGES SINCE THE LAST
READING OF THE MESSAGE FILE.
```

```
/H PRINT THIS TEXT
/A TYPES ALL MESSAGES IN THE FILE
/P FOR PERUSING MESSAGES ONLY
/S WILL CAUSE RDMAIL TO PAUSE AFTER EACH MESSAGE TYPED
/M WILL USE THE MESSAGE OF THE DAY FILE FOR MESSAGE TYPE OUT
/L WILL OUTPUT MESSAGES TO THE LINE PRINTER
```

```
DATE AND TIME (/H FOR HELP)
```

SOFTWARE TASKS

----- Hint -----

Because the file PS:<REMARKS>MAIL.TXT continues to get bigger as users MAIL their remarks, you should periodically RENAME it and save the renamed file on magnetic tape with DUMPER.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Message -----

?ILLEGAL SEPARATOR IN DATE/TIME FIELD

You typed an invalid date and/or time.

SOFTWARE TASKS

5.1.10 Reporting System Errors with SYSERR

SYSERR is a program that lists the contents of the system error file for you. You should run it daily for summary information (see examples 1,2 and 4) and file it for later reference by field service. Then, whenever there is an indication that a piece of hardware is failing, run SYSERR again and request a detailed report for that device.

To run SYSERR, type the following to PTYCON.

1. PUSH
2. SYSERR
3. Command lines to SYSERR
4. CTRL/C
5. POP

When SYSERR is started, it prompts with *. At that time you can type a command line to SYSERR. When SYSERR has finished processing one command line, it prompts again with *, so that you can give another or type CTRL/C to stop.

To see the SYSERR help file on your terminal, type the command line /HELP to SYSERR.

SYSERR can also process commands from a disk file as well as from your terminal. This disk file, an indirect command file, is useful if you have a set of command lines that you often use. To make the indirect command file, create a file with the same command lines that you would normally type to SYSERR from your terminal. Then type the following to SYSERR:

```
*@dev:name.typ
```

where dev is the location of the file (default is DSK:) and name.typ is the name of the indirect command file.

The general form of a command line to SYSERR is:

```
*odev:ofile.typ=idev:ifile.typ/switch/switch... (RET)
```

where:

odev: = the output device where you want the listing file.
It may be any device which can perform output.

ofile.typ = the name and type of the listing file.

idev: = the input device where the system error file resides.
It may be any device which can perform input.

ifile.typ = the name and type of the input file.

/switch: = the control switches which tell SYSERR what types of errors or listings you want.

SOFTWARE TASKS

In some cases it is not necessary to type a full command line to SYSERR. Certain portions have default values that SYSERR uses if you omit them from the command line. The default values used by SYSERR are:

COMMAND PORTION	DEFAULT
odev:	DSK: in your connected directory
ofile.typ	The default for OFILE is the listing control switch specified, and the default for TYP is LST. For /MASALL the output file would be MASALL.LST.
idev:	<SYSTEM> on your connected structure
ifile.typ	ERROR.SYS
/switch	/ALLSUM - If this default is used, the default output file is ERROR.LST.

The listing control switches available for use include:

SWITCH	FUNCTION
/ALL	List all entries
/ALLNXM	List all entries caused by NXM
/ALLPAR	List all entries caused by parity errors
/ALLPER	List all performance entries
/ALLSUM	Give all device summaries
/CPUALL	List all processor-related entries
/CPUPAR	List processor entries caused by parity errors
/CPUPER	List all CPU performance entries
/MASALL	List all entries concerning MASSBUS devices (TU45, TU77, DX20, RP04, and RP06)
/MASPAR	List MASSBUS entries caused by parity errors
/MASNXM	List MASSBUS entries caused by NXM
/NETALL	List all network entries (doesn't include ARPANET)
/NETPER	List network performance entries (doesn't include ARPANET)

SOFTWARE TASKS

Other control switches are also available to further control the listing. They are used to select a particular device, group of devices, or errors occurring during a specific date/time period. Switches of this type include:

SWITCH	FUNCTION
/BEGIN:mm-dd-yy:hh:mm:ss	Begin listing with entries logged on or immediately after the date and time specified by mm-dd-yy:hh:mm:ss. Other date formats such as JAN-16-1976 are acceptable. The format dd-mm-yy can be ambiguous, so it is not recommended. You can also use -nD for the date and time, which means from n days ago.
/DETAIL:	List all information for MASSBUS and magnetic tape. The abbreviation /DET is acceptable.
/DEV:name /DEV:type	List only those entries which involve the device specified by name or type. Available device types include 11CPU, KLCPU, LP20, CD20, DH11, TU45, TU77, DX20, RPU4, RPU6, KLINIK, and KLERR. To indicate a specific disk drive (DP) or magnetic tape drive (MT), you must use /DEV:name. Name is in the form DPabc or MTabc, where: a = the logical controller address b = the logical MASSBUS address c = the logical slave address for MT and 0 for DP. If /DEV:name is used, a listing control switch, such as /MASALL, must be used. Using only /DEV:type without a listing switch, such as /MASALL, causes SYSERR to examine each entry and force listings for entries with a device type matching that specified.
/END:mm-dd-yy:hh:mm:ss	End listing with entries on or immediately prior to the date and time specified. The same formats as above are acceptable.
/NDEV:name	Use with /MASALL to list all MASSBUS entries for devices other than the device name specified. Name is in the form DPabc or MTabc. This form is explained under /DEV:.
/RETRY:n	List only those entries whose retry count is greater than n.

SOFTWARE TASKS

----- Examples -----

1. To list on your terminal summary information about the entire contents of the error file:

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(360)
@SYSERR

FOR HELP, TYPE "/HELP"
*TTY:=

      .
      .
      .

*^C
@POP
```

Because SYSERR uses defaults for unspecified portions of the command line, TTY:= is equivalent to:

```
TTY:ERROR.LST=<SYSTEM>ERROR.SYS/ALLSUM
```

2. To list on your terminal summary information for errors which occurred in the last 24 hours:

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(360)
@SYSERR

FOR HELP, TYPE "/HELP"
*TTY:=/BEGIN:-1D

      .
      .
      .

*^C
@POP
```

The value specified in the /BEGIN switch may be changed to increase the number of days (-7D for 1 week), It can also be used to specify a date as described under /BEGIN.

3. To obtain a detailed report for all entries from the the system error file concerning any RP04 and write the report into the file ERROR.LST on your disk area:

See example 1 above, but substitute the command line:

```
*=/DEV:RP04/DETAIL:
```

Note that * is the SYSERR prompt.

Later you can print the file on the line printer.

SOFTWARE TASKS

4. To obtain summary information about the entire contents of the error file and write it into the file ERROR.LST on your disk area:

See example 1 above, but substitute the command line:

```
*=
```

This command line uses all the defaults. Thus it is equivalent to:

```
*DSK:ERROR.LST=<SYSTEM>ERROR.SYS/ALLSUM
```

5. To create the file MASALL.LST on your disk area which contains detailed information about all the errors detected by device DP030 from 1a.m. on January 1, 1976, to 1a.m. January 7, 1976:

See example 1 above, and substitute the command line:

```
*=/MASALL/BEGIN:JAN-1-76:1:00/END:JAN-7-76:1:00/DEV:DP030/DET
```

6. To write the report on MTA1 and read the error file from MTA2 and list all entries concerning either a MASSBUS device or the CPU during a period beginning 30 days ago and ending 3 days ago:

First ASSIGN and mount magnetic tapes. Then see example 1 above, and substitute the command line:

```
*MTA1:=MTA2:/MASALL/CPULL/BEGIN:-30D/END:-3D
```

7. To execute the commands in the file SYSERR.CMD:

See example 1 above and substitute the command line:

```
*@SYSERR.CMD
```

8. To get KLERR information after a TOPS-20 crash and write it into the file KLERR.LST on your area:

See example 1 above and substitute the command line:

```
*KLERR.LST=/DEV:KLCPU/BEGIN:-0:30
```

You should put this command line into a file and then give the @file command as in example 7.

9. To list all network information into the file NET.LST on your area (doesn't include ARPANET):

See example 1 above and substitute the command line:

```
*NET.LST=/NETALL
```

----- Hint -----

Refer to the DECSYSTEM-20 Error Detection, Recovery, and Reporting Reference Manual for more information on SYSERR.

SOFTWARE TASKS

5.1.11 Backing Up Disk Files on Magnetic Tape with DUMPER

To minimize loss of disk files, you should put backup copies of files on magnetic tape with DUMPER. This should be done on a daily basis. You have the option of saving either all disk files or only those which haven't been saved before (an incremental save). It is advisable to save all files once a week and to do an incremental save the other days.

If your installation has structures other than PS:, the public structure, be sure to back up files on those structures too. Use different magnetic tapes for different structures, and follow the procedure for a full save or incremental save for each structure. (Refer to the DECSYSTEM-20 User's Guide for details on DUMPER.)

NOTE

An incremental save includes those files which haven't been saved since the last incremental save. The first incremental save is equal to a complete save.

To save all disk files of a structure, do the following:

1. Type CONNECT 0 to PTYCON.
2. Type ENABLE.
3. Type ASSIGN MTAn:.. Also assign any other tape drives you expect to use (step 8).
4. Mount a magnetic tape, to which you can write, on the assigned drive.
5. If you want to save files from a structure other than PS:, type SMOUNT structure:..
6. Type DUMPER.

SOFTWARE TASKS

7. Type the following DUMPER commands.

```
TAPE MTAn:  
REWIND  
LIST filename  
SAVE structure:
```

Structure is the name of the structure for which you did the SMOUNT above; or it is omitted, along with the colon, to indicate your currently connected structure.

As DUMPER starts to save files for each directory on the structure, it prints the structure and directory name.

8. If you receive the message:

```
END OF TAPE, CONTINUE SAVE ON  
TAPE (FILESPEC)
```

mount another tape, to which you can write, on MTAn or on any available drive that you have assigned in step 3. Then type MTAm: RET, where m is the number of the drive on which you just mounted the tape.

9. After DUMPER has finished the SAVE and prompted with DUMPER>, type REWIND RET and EXIT RET.
10. If you did an SMOUNT above, type SDISMOUNT structure:.
11. Unload any magnetic tapes that you still have mounted.
12. Type DEASSIGN MTAn:.
13. Print the file specified in the LIST command in step 7.
14. Type DISABLE.
15. Type CTRL/X to return to PTYCON.
16. Dismount magnetic tapes.
17. Store the magnetic tapes and DUMPER's output to your terminal in the place decided upon by your system manager.

SOFTWARE TASKS

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(3)]
ENABLE
$ASSIGN MTA1:
$DUMPER

DUMPER 3(163)

DUMPER>TAPE MTA1:
DUMPER>REWIND
DUMPER>LIST 27JAN.LOG
DUMPER>SAVE

DUMPER TAPE # 1, , THURSDAY, 27-JAN-77 1010
PS:<SYSTEM>
PS:<SUBSYS>
PS:<ACCOUNTS>
PS:<OPERATOR>
PS:<SPOOL>
.
.
.
PS:<BARON>
PS:<GLEAN>
PS:<PALL>

TOTAL FILES DUMPED = 467
TOTAL PAGES DUMPED = 7721
DUMPER>REWIND
DUMPER>EXIT
$UNLOAD MTA1:
$DEASSIGN MTA1:
$PRINT 27JAN.LOG
[LPT:27JAN=/SEQ:101/LIMIT:50, 1 FILE]
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

To do an incremental save of a structure, do the following:

1. Type CONNECT 0 to PTYCON.
2. Type ENABLE.
3. Type ASSIGN MTAn:. Also assign any other tape drives you expect to use (step 8).
4. Mount a magnetic tape, to which you can write, on the assigned drive.
5. If you want to save files from a structure other than PS:, type SMOUNT structure:.
6. Type DUMPER.
7. Type the following DUMPER commands.

```
TAPE MTAn:  
REWIND  
LIST filename  
SAVE /INCREMENTAL structure:
```

Structure is the name of the structure for which you did the SMOUNT above; or it is omitted, along with the colon, to indicate your currently connected structure.

DUMPER prints the structure and directory name of the files it saves.

8. If you receive the message:

```
END OF TAPE, CONTINUE SAVE ON  
TAPE (FILESPEC)
```

mount another tape, to which you can write, on MTAn or on any available drive that you have assigned in step 3. Then type MTAm: (m), where m is the number of the drive on which you just mounted the tape.

SOFTWARE TASKS

9. After DUMPER has finished the SAVE and prompted with DUMPER>, type REWIND (RET) and EXIT (RET).
10. If you did an SMOUNT above, type SDISMOUNT structure:.
11. Unload any magnetic tapes that you still have mounted.
12. Type DEASSIGN MTAn:.
13. Print the file specified in the LIST command in step 7.
14. Type DISABLE.
15. Type CTRL/X to return to PTYCON.
16. Dismount magnetic tapes.
17. Store the magnetic tapes and DUMPER's output to your terminal in the place decided upon by your system manager.

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(3)]
ENABLE
$ASSIGN MTAl:
$SMOUNT SNARK:
STRUCTURE SNARK: MOUNTED
$DUMPER

DUMPER 3(163)

DUMPER>TAPE MTAl:
DUMPER>REWIND
DUMPER>LIST 28JAN.LOG
DUMPER>SAVE /INCREMENTAL SNARK:
DUMPER TAPE # 1, , FRIDAY, 28-JAN-77 1110
SNARK:<SYSTEM>
.
.
.
SNARK:<PALL>

TOTAL FILES DUMPED = 251
TOTAL PAGES DUMPED = 5217
DUMPER>REWIND
DUMPER>EXIT
$SDISMOUNT SNARK:
STRUCTURE SNARK: DISMOUNTED
$UNLOAD MTAl:
$DEASSIGN MTAl:
$PRINT 28JAN.LOG
[LPT:28JAN=/SEQ:187/LIMIT:23, 1 FILE]
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

----- Hints -----

If you are saving disk files with DUMPER and the system crashes, you do not have to start from the beginning after the system is started again. Do the following:

1. Leave the tape positioned where it is.
2. CONNECT to subjob 0.
3. Type ENABLE.
4. Type ASSIGN MTAn: and assign any other tape drives you expect to use later in this procedure. (See step 8 in the two preceding procedures in this section.)
5. If you are saving files from a structure other than PS:, type SMOUNT structure:.
6. Type DUMPER.
7. Type the following DUMPER commands.

```
TAPE MTAn:  
LIST filename  
INIT <directory>  
SET TAPE-NUMBER n  
SAVE structure: or SAVE /INCREMENTAL structure:
```

where filename is the DUMPER log file, directory is the last directory name output by DUMPER before the system crashed, n is the relative reel number that you are currently using (the first reel is 1), and structure is the name of the structure for which you did the SMOUNT above. You can omit structure: to indicate your currently connected structure.

8. Follow steps 8 through 17 above.

If you are restoring files with DUMPER and the system crashes, you can use the same technique stated in the hint above. Simply replace the SAVE command and switches with RESTORE and appropriate switches.

You should always specify a disk file after the LIST command to DUMPER to ensure that the information in the log file is correct. If you LIST the log file to the spooled line printer (as in LIST LPT:DUMPER.LOG, the default file specification) and the system crashes, you may not be able to print or continue the log file.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

SOFTWARE TASKS

5.1.12 Ending Timesharing with ^ECEASE

As soon as you know the next scheduled time to end timesharing, use the ^ECEASE command. Type to PTYCON:

1. PUSH
2. ENABLE
3. ^ECEASE (TIMESHARING AT) date time (RESUMING AT) date time
(See details in Appendix A under ^ECEASE.)
4. POP

----- Examples -----

1. PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE
\$^ECEASE 26-AUG-77 1900 26-AUG-77 2000
[SYSTEM GOING DOWN AT 26-NOV-76 19:00:00]
\$POP
PTYCON>
2. To cancel a ^ECEASE command, type ^ECEASE and press RETURN.

\$^ECEASE
[SHUTDOWN CANCELLED]

If you also need to power off the hardware after timesharing has finished, do the following:

1. Wait until SHUTDOWN COMPLETE is output on the CTY.
2. Type CTRL/\ (control backslash) to enter the console processor command language.
3. Give the SHUTDOWN command and wait for the **HALTED** message.
4. Unload all tape drives.
5. Power off the tape drives.
6. Stop all disk drives by setting the START/STOP switch to STOP.
7. Turn off system power by setting the black power switch to POWER OFF.

SOFTWARE TASKS

5.2 OTHER TASKS

The tasks in Sections 5.2.1 through 5.2.1.2 could be daily tasks at your installation, but they could also be scheduled less frequently. Decide upon a schedule for them with your system manager.

The tasks in the remaining sections of this chapter are performed as needed.

5.2.1 Generating Accounting Reports

The USAG20 program allows you to produce accounting reports from system accounting data. The CHPNT program enables you to include disk usage in these reports and makes the accounting data available to USAG20.

These accounting functions are discussed briefly in Sections 5.2.1.1 and 5.2.1.2. You can find more information in the DECSYSTEM-20 USAGE File Specification.

You must discuss with your system manager the schedule for performing these tasks.

NOTE

USAG20 does not receive top priority support, because it is included in the list of category C software. However, the USAG20 program is discussed here for anyone wishing to use it.

SOFTWARE TASKS

5.2.1.1 Getting Disk and System Usage with CHPNT - To include disk usage in the accounting reports and then make the disk and system usage available for reports, type to PTYCON:

1. CONNECT O
2. ENABLE
3. CHPNT
4. DISK-STATISTICS structure:

Repeat this command for each structure for which you want disk usage. If you omit structure:, your currently connected structure is used.

5. COPY (SYSTEM DATA TO) output file

The output file can contain up to six characters for the filename and three characters for the filetype. It will later be used as the input file for USAG20. The default filename is USAGE.OUT in your connected directory.

6. EXPUNGE (PROCESSED SYSTEM DATA)
7. EXIT
8. DISABLE
9. CTRL/X

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(5)]
ENABLE
$CHKPNT
TOPS20 CHPNT VERSION 3
CHKPNT>DISK-STATISTICS (FOR STRUCTURE) PS:
CHKPNT>DISK-STATISTICS (FOR STRUCTURE) AK:
CHKPNT>COPY (SYSTEM DATA TO) USAGE.OUT
CHKPNT>EXPUNGE (PROCESSED SYSTEM DATA)
      [123 PAGES FREED]
CHKPNT>EXIT (TO MONITOR)
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

----- Hints -----

If you run CHPNT under batch, you must use R CHPNT.

If you do not want any reports on disk usage, omit step 4 above.

The EXPUNGE command to CHPNT in step 6 deletes and expunges all system accounting data files already processed by the COPY command to CHPNT. If you want to save these files, you should rename them, copy them, or save them with DUMPER before you expunge them. The files are called SYSTEM-DATA.BIN.n in PS:<ACCOUNTS>, where n is a generation number. If you do not expunge these files, the next COPY command to CHPNT will process them again and make them available to USAG20 again.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Messages -----

?CHPNT: COULD NOT FIND SYSTEM-DATA FILE
? JSYS ERROR: DIRECTORY ACCESS PRIVILEGES REQUIRED

You typed the COPY command, but you do not have privileges to read the SYSTEM-DATA files. Be sure you are connected to a subjob of PTYCON, logged in under OPERATOR, and enabled.

? CHPNT: GARBAGE AT END-OF-COMMAND

You did not type carriage return or line feed after a command.

? CHPNT: INVALID FILENAME SPECIFIED

Your file specification contained an invalid filename or an unmounted structure.

? CHPNT: INVALID STRUCTURE NAME GIVEN

You specified an unmounted structure, you forgot the colon after the structure name, or you omitted the structure name.

? CHPNT: NO SUCH CHPNT COMMAND AS "xxx"

You typed "xxx," which is not a valid CHPNT command.

SOFTWARE TASKS

5.2.1.2 **Reporting Usage with USAG20** - To get various cost summaries reported in a disk file, which can later be printed on the line printer and distributed, do the following. First, be sure that you processed system accounting data with the COPY command to CHPNT (Section 5.2.1.1). You may or may not have included disk usage. Second, be sure you have USAG20.CHG in your connected directory. Your system manager should have created USAG20.CHG by using the information in the DECSYSTEM-20 USAGE File Specification. Then, connect to subjob 0 of PTYCON and type:

1. USAG20

2. input file

This is the file output by the COPY command to CHPNT in the previous section. The default is USAGE.OUT in your currently connected directory.

3. S or D

S will give a report of system usage, and D will give a report of disk usage. You can press RETURN to get system usage, the default.

4. N or A

N will sort the report by directory name, and A will sort the report by account. You can press RETURN to get name, the default.

5. output file

This is the file that will contain the report. The default is USAGE.RPT in your currently connected directory.

6. EXIT

7. PRINT output file/REPORT:argument

The argument must correspond to the type of report requested. The type of report and arguments are:

Report	Argument
System usage by name	NAME
System usage by account	ACCOUNT
Disk usage by name	DNAME
Disk usage by account	DACCOUNT

8. CTRL/X

If you want to produce different reports, after step 5, go back to step 2.

For easy identification you might use an output file that indicates the day or week of the report.

SOFTWARE TASKS

----- Example -----

```
PTYCON> CONNECT O
[CONNECTED TO SUBJOB O(5)]
USAG20
TOPS20 ACCOUNTING SYSTEM
READ USAGE FILE: USAGE.OUT
  INPUT FILE NAME: USAGE .OUT
REPORT BY [SYSTEM USAGE (S) OR DISK USAGE (D)]: S
SORT BY [NAME (N) OR ACCOUNT (A)]: N
WRITE TO FILE: USAGE.RPT
  OUTPUT FILE NAME: USAGE .RPT
READ USAGE FILE: EXIT

EXIT

@PRINT USAGE.RPT/REPORT:NAME
[LPT:USAGE=/SEQ:105/LIMIT:100, 1 FILE]
@^X
PTYCON>
```

----- Hint -----

Refer to the DECSYSTEM-20 USAGE File Specification for additional accounting information.

----- Requirement -----

OPERATOR or WHEEL capability is necessary to have given the COPY command to CHPNT previously.

SOFTWARE TASKS

----- Error Messages -----

FILE CHARGE-FILE [USAG20CHG] CANNOT BE OPENED ON DEVICE DSK

When you run USAG20, you must have the file USAG20.CHG in your connected directory. This file, which should be created by your system manager, contains billing rates.

FILE IN-FILE [inputfile] CANNOT BE OPENED ON DEVICE DSK

The file that you want USAG20 to read must be in your connected directory. Inputfile is the filename and filetype that USAG20 interpreted from what you typed after READ USAGE FILE:.

INCOMPLETE INPUT SPOOLER ENTRY

USAG20 did not find all three records of an input spooler entry. Therefore, the other records of the entry are ignored.

INCOMPLETE OUTPUT SPOOLER ENTRY

USAG20 did not find all three records of an output spooler entry. Therefore, the other records of the entry are ignored.

INCOMPLETE SESSION ENTRY

USAG20 did not find all three records of a session entry. Therefore, the other records of the entry are ignored.

INPUT FILE ERROR: inputfile

You typed inputfile after READ USAGE FILE:, but inputfile was not a valid filename and filetype.

OUTPUT FILE ERROR: outputfile

You typed outputfile after WRITE TO FILE:, but outputfile was not a valid filename and filetype.

SOFTWARE TASKS

5.2.2 Restoring Certain Files from Magnetic Tape to Disk with DUMPER

If a user requests that you restore some files for him from a magnetic tape, be sure to find out:

1. What magnetic tape(s) to use. You might have to use a tape containing a complete SAVE and some tapes from an INCREMENTAL SAVE. You or the user should look through the terminal output kept for each DUMPER SAVE and determine which tapes to use.
2. What files to restore and what directory they are in.
3. What directory to put them into.
4. What special DUMPER status commands to use, if any. (See the DECSYSTEM-20 User's Guide for details on DUMPER status commands.)

Then do the following:

1. CONNECT to the subjob O.
2. Type ENABLE.
3. Type ASSIGN MTAn:.
4. If you are connected to another structure, CONNECT to structure PS:.
5. Type DUMPER.
6. Type the following DUMPER commands.

TAPE MTAn:
REWIND
LIST filename
DUMPER status commands, separated by
RESTORE arguments

(See argument types below or refer to the RESTORE command in the DECSYSTEM-20 User's Guide.)
7. When DUMPER prompts again, type EXIT.
8. Type UNLOAD MTAn:.
9. Type DEASSIGN MTAn:.
10. Type DISABLE.
11. Type CTRL/X to return to PTYCON.
12. Dismount the magnetic tape.
13. Print the file that you specified in the LIST command above.

SOFTWARE TASKS

Argument types for RESTORE:

1. To restore an entire user area, i.e., to copy all the files of directory PS:<DIR> on tape to directory PS:<DIR> on disk:
RESTORE <DIR>
2. To restore certain files of directory PS:<DIR> on tape to directory PS:<DIR> on disk:
RESTORE <DIR>file1,<DIR>file2,...
3. To restore PS:<A>A.MAC to PS:<SOURCE>A.MAS and PS:X.MAC to PS:<SOURCE>X.MAS:
RESTORE <A>A.MAC <SOURCE>A.MAS,X.MAC <SOURCE>X.MAS
4. To copy all files from PS:<SOURCES> on tape to OLD:<SOURCES> on disk:
(Be sure to SMOUNT OLD before you run DUMPER, and SDISMOUNT OLD after you run DUMPER.)
RESTORE PS:<SOURCES> OLD:<SOURCES>

(For more information on DUMPER, refer to the DECSYSTEM-20 User's Guide.)

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Hint -----

If the user's files on the DUMPER tape(s) have accounts not in the installed ACCOUNTS-TABLE.BIN file, do the following:

1. Log in under the user who requested the file restoration and specify a valid account for that user.
2. Follow steps 3 through 9 in the procedure above, but be sure to type the DUMPER command:

ACCOUNT SYSTEM-DEFAULT

before the RESTORE command to DUMPER.

3. Type LOGOUT.

SOFTWARE TASKS

5.2.3 Helping a User Having Problems with a Terminal

If a user tells you that he is getting no response from his terminal, try the following:

1. Check speed or baud rate. Ask the user for his terminal number, or if the user was logged in, do a SYSTAT user to determine the terminal number. Then type the file SYSTEM:n-CONFIG.CMD, where n is the TOPS-20 release number. Find the line referring to the proper terminal number and see what its initial speed should be. If the terminal number is not in the file, the speed is 300. If the terminal is designated for autobaud detection, the speed is 110, 150, or 300. Have the user manually set the terminal for the correct speed and then try again. (Refer to the DECSYSTEM-20 Software Installation Guide for more information on n-CONFIG.CMD and setting terminal speeds.)
2. If Step 1 doesn't work, be sure the user leaves the terminal set for the speed in the n-CONFIG.CMD file. Then type to PTYCON:

```
PUSH
ENABLE
^ESET TERMINAL n SPEED m
POP
```

where n is the terminal number and m the speed in the n-CONFIG.CMD file. Then have the user try again.

3. If Step 2 doesn't succeed because the user can't set the terminal for the speed in the n-CONFIG.CMD file, you should do a ^ESET TERMINAL command as above for a speed which the user can manually set for the terminal. Then have the user try again. If that succeeds and the terminal is going to be used permanently, you should also edit the file SYSTEM:n-CONFIG.CMD to contain the correct initial speed for that terminal.
4. If none of the above works, the terminal is broken or the job is hung. Notify the user of his options, given below. Then notify your system manager and software contact.

If a terminal is not functioning correctly or a job is hung, the user has the following options.

1. If not logged in, he can simply look for another terminal and log in.
2. If he is logged in and wants the same job, try to unattach the user's job. Type to PTYCON:

```
PUSH
ENABLE
UNATTACH (USER) name (JOB #) n
(RET) after [ATTACHED TO TTYxxx, CONFIRM]
POP
```

where name is the user's name and n the user's job number.

The user should then try to attach to job n at another terminal. If he is still unsuccessful, go to step 3.

SOFTWARE TASKS

3. If the user is logged in, you can try to log him out by typing to PTYCON:

```
PUSH
ENABLE
LOGOUT n
POP
```

where n is the user's job number. (Section 5.2.4 has more detail on logging out a user.) If LOGOUT succeeds within ten seconds and the terminal is functioning correctly, the user should then be able to log in at his same terminal. If it doesn't succeed, go to step 4 and report the problem to your software contact.

----- Example -----

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE
$LOGOUT 23
$POP
PTYCON>
```

4. If the user is logged in and LOGOUT in step 3 did not work because of system software problems, you can unattach him by typing to PTYCON:

```
PUSH
ENABLE
UNATTACH (USER) name (JOB #) n
  (RET) after [ATTACHED TO TTYxxx, CONFIRM]
POP
```

where name is the user's name and n the user's job number.

The user should then be able to log in at the same terminal. If he can't, there is a problem with the terminal, the terminal line, or the system. Report the situation to your system manager. The user must try another terminal or terminal line.

----- Example -----

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(357)
@ENABLE (CAPABILITIES)
$UNATTACH (USER) PORADA (JOB #) 23
  [ATTACHED TO TTY105, CONFIRM] (RET)
$SYSTAT 23
  23 DET EXEC PORADA
$POP
```

SOFTWARE TASKS

5. If the user cannot find another terminal, he may request that you perform some task for him. If this is within the rules of your installation, you can perform the task for the user. You might do the entire task from the subjob 0, or you might attach to the user's job from the subjob 0, perform the task, log out, and attach back to the subjob being sure to give the correct password.

To attach to a user's job, type to PTYCON:

```
CONNECT 0
ENABLE
ATTACH user n
```

where user is the user's name and n is the user's job number.

----- Example -----

```
PTYCON> CONNECT (TO SUBJOB) 0
[CONNECTED TO SUBJOB 0(3)]
ENABLE
$ATTACH (USER) POR (JOB #) 23
  DETACHING JOB # 3
@          !PERFORM TASK FOR USER
.
.
.
@LOGO
KILLED JOB 23, USER POR, ACCOUNT 104, TTY 101,
  AT 8-SEP-77 08:55:16, USED 0:0:6 IN 0:5:1

LOAD-TEST SYSTEM, TOPS-20 MONITOR 3(1271)
@ATTACH (USER) OPERATOR (JOB #) 3
$^X
PTYCON>
```

----- Hints -----

You can find more information on the n-CONFIG.CMD file in the DECSYSTEM-20 Software Installation Guide.

More information on the ^ESET TERMINAL command is in Appendix A.

Once a user establishes terminal communication, he can use the TERMINAL SPEED command (in the DECSYSTEM-20 User's Guide) to specify a different speed and then manually set the terminal for that speed.

SOFTWARE TASKS

5.2.4 Logging Out a User with LOGOUT

To get rid of unwanted jobs from the system, type the command:

```
LOGOUT n
```

where n is the number of the job you want to eliminate. You must first enable to do this. Also, be absolutely sure that a job is unwanted before you log it out.

The types of unwanted jobs should be listed for you by the system manager. Then you can periodically give the SYSTAT command and check the output against the list to find any unwanted jobs. A possible list of unwanted jobs and ways of identifying them in the SYSTAT output is:

1. Jobs that haven't used any runtime over a certain time period. Periodically use the command SYSTAT TIME or SYSTAT n TIME, where n is a job number, to see if the job's runtime has increased.
2. All jobs that have been detached longer than five minutes, provided your system manager has decided not to allow any detached jobs and has sufficiently warned all users of this. This means you should log out all users whose line designation in the output from SYSTAT is DET, which means detached. However, you are never able to log out SYSJOB.
3. A job that a user has requested you to log out for him due to some problem. Be sure the request is valid, perhaps by asking the user his password and verifying it with ^EPRINT (Section 5.1.7.2). Then check that the job number the user wants you to log out belongs to that user. Do this by typing to the PTYCON subjob 0:

```
PTYCON> O-SYSTAT n
```

where n is the job number, and check that the user name is correct. If all is well, you can log out the job.

----- Example -----

If you want to log out job 7 and you have a subjob of PTYCON called 0, which is logged in as OPERATOR having WHEEL or OPERATOR capability, type:

```
PTYCON> CONNECT 0  
[CONNECTED TO SUBJOB 0(4)]  
ENABLE  
$LOGOUT 7  
$DISABLE  
@^X
```

SOFTWARE TASKS

----- Hints -----

Because there is no message output on your terminal to indicate that you have successfully logged out another job, you can use SYSTAT to verify that the job is gone. However, keep in mind that by the time you give the SYSTAT command a user could already have that job number again.

If you log out a job that was a subjob of some PTYCON job, that PTYCON job will output a message about the subjob being killed.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Messages -----

?ILLEGAL TO LOGOUT JOB 0

You are not allowed to log out job 0 under which SYSJOB runs.

?THAT JOB DOES NOT EXIST

You typed the wrong job number, or the job you intended to log out is already logged out.

?WHEEL OR OPERATOR CAPABILITY REQUIRED TO LOGOUT ANOTHER JOB

You must have WHEEL or OPERATOR capability given to you when your directory was created, and you must type ENABLE first.

SOFTWARE TASKS

5.2.5 Giving Input to Another Job with ADVISE

If you ever need to provide input to another job, you can do so with the ADVISE command. Type PUSH to PTYCON and then give the following command, or type the following to a PTYCON subjob:

```
ADVISE user
or
ADVISE n
```

where n is the number of the user's terminal. If you use the command ADVISE user and the user has a job on more than one terminal, the system lists each terminal number and what is being run on that terminal. The system then outputs TTY: and waits for you to type the terminal number that you want to advise.

The command links your terminal and the other job's terminal as in the TALK command (Section 4.4.6). Then, whatever text the system would normally print on your terminal or the other job's terminal appears on both terminals.

Unlike the TALK command, however, anything you type is used as input for the other job. To send a control character, type CTRL/^ (CTRL/up-arrow) and the character. To end the ADVISE command, type CTRL/E.

----- Example -----

To deassign a magnetic tape drive for job 11:

```
@ENABLE
$ADVISE 17
  ESCAPE CHARACTER IS <CTRL>E, TYPE <CTRL>^? FOR HELP
  BONS JOB 11 EXEC

LINK FROM BONS, TTY 20
[ADVISING]
SY .
  11* 17 EXEC BONS
$DEASSIGN MTA0
$                                !CTRL/E typed here
[ADVICE TERMINATED]
$DISABLE
@
```

----- Requirement -----

The terminal for the job that you are trying to advise must have been set to accept advice by that job having done a RECEIVE ADVICE command. However, if you have OPERATOR or WHEEL capability enabled, advice is always accepted by another job.

----- Error Message -----

```
?DESTINATION NOT RECEIVING ADVICE
```

The terminal that you are trying to advise is not accepting advice. Enable for OPERATOR capability and try again.

SOFTWARE TASKS

5.2.6 Creating a Structure during Timesharing

While the system is timesharing, you can create a structure by doing the following:

1. Obtain the number of formatted disk packs needed for the structure.
2. Physically mount the packs on any available disk drives.
3. Under a job logged in as OPERATOR, type ENABLE.
4. Run CHECKD.
5. Type CREATE structure name to CHECKD.
6. Answer questions from CHECKD.
7. Type EXIT to CHECKD.
8. Type DISABLE.

When you are running CHECKD, you must first type the CREATE command and specify the name of the structure you want to create. This name is a physical identification written on the structure by CHECKD.

CHECKD then asks a series of questions. For each question you can type ? to get a help message. The questions are:

ENTER ALIAS:

Type a 1- to 6-character alphanumeric name for the alias. If no other structure on the system has the same name as the structure you are creating, type the structure name as the alias. If another structure of the same name is mounted, press RETURN to get the default alias, CHECKD. The alias is just a temporary name that the system uses for your structure.

HOW MANY UNITS IN THIS STRUCTURE?

Type the decimal number of disk packs that will be in the structure.

CHANNEL , DRIVE FOR LOGICAL UNIT n:

This question is asked for each unit n in the structure. You must type in a channel number, followed by a comma and a unit (or drive) number to indicate where unit n is currently mounted.

The help message for this question is similar to:

PAIR OF OCTAL NUMBERS FROM ONE OF THE FOLLOWING:

TYPE	CHANNEL	DRIVE	STRUCTURE NAME	LOGICAL UNIT
RP06	1	0	OFF-LINE	
RP06	1	1	OFF-LINE	
RP04	1	2	STR2	0 (1 OF 1)
RP06	1	5	OFF-LINE	

SOFTWARE TASKS

This output lists each drive that is currently unavailable for use by other users on the system. Thus, each disk pack for the structure you are creating must be on some drive in the list. A structure name appears in the list if a disk pack is on-line and was formerly part of a structure. Do not specify the drive for that pack if you still want data from that structure.

If the help message does not eliminate confusion over channel and drive correspondence, consult your field service representative.

NUMBER OF PAGES TO ALLOCATE FOR SWAPPING?

Type 0 if the structure is never going to be used as a public structure, PS:.. Press ESCAPE to set the default value. Type a decimal number between 2000 and 40000 to specify an amount.

If you have any question about the amount of swapping space, see your system manager. Note that swapping space is necessary on a public structure, but the default value is usually sufficient. (See Section 6.11 to use a public structure other than PS:.) If past experience has shown many SWAPPING SPACE LOW messages, you may need more swapping space. Increasing the swapping space here, however, may not be sufficient, because the maximum swapping space allocated by the monitor takes precedence.

NUMBER OF PAGES TO ALLOCATE FOR THE FRONT END FILE SYSTEM?

Type 0 if the structure will never be used as the public structure, PS:.. Press ESCAPE to get the default; the default should always be sufficient for the front-end file system.

OWNER NAME?

Type a 1- to 12-character alphanumeric name for the owner of the structure.

When CHECKD finishes the CREATE function, it prompts again. You can then exit from CHECKD.

CAUTION

When you create a structure, you destroy any information that was previously on the disk packs in the structure being created. If you want to save any information from an old structure, run DUMPER to save the files before you create the new structure on the same disk packs.

SOFTWARE TASKS

----- Example -----

In this example structure QWERTY is created as a 1-pack structure. An ESCAPE was pressed to get the defaults for the allocation of pages for swapping space and the front-end file system. Therefore, QWERTY has the possibility of being used as a public structure.

```
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0(6)]
ENABLE
$CHECKD
CHECKD>CREATE (NEW FILE SYSTEM FOR) QWERTY
ENTER ALIAS: QWERTY
HOW MANY UNITS IN THIS STRUCTURE? 1
CHANNEL , DRIVE FOR LOGICAL UNIT 0: ?
```

PAIR OF OCTAL NUMBERS FROM ONE OF THE FOLLOWING:

TYPE	CHANNEL	DRIVE	STRUCTURE NAME	LOGICAL UNIT
----	-----	-----	-----	-----
RP06	1	2	STR2	0 (1 OF 1)

```
CHANNEL , DRIVE FOR LOGICAL UNIT 0: 1,2
NUMBER OF PAGES TO ALLOCATE FOR SWAPPING? 3050
NUMBER OF PAGES TO ALLOCATE FOR THE FRONT END FILE SYSTEM? 950
OWNER NAME? KIRSCHEN
```

```
[QWERTY: MOUNTED AS QWERTY:]
```

```
[DISMOUNTING STRUCTURE - QWERTY:]
```

```
CHECKD>EXIT
$DISABLE
@~X
PTYCON>
```

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Messages -----

?INVALID CONFIRMATION

You typed an invalid character within or after an argument.

? INVALID DECIMAL NUMBER

You did not type a valid decimal number for the argument.

? NAME STRING GREATER THAN 12. CHARACTERS

You typed more than 12 decimal characters for the owner name.

?WHEEL OR OPERATOR CAPABILITY REQUIRED

You must have WHEEL or OPERATOR capability enabled. Use a job logged in under OPERATOR, which should have OPERATOR capability, and type ENABLE before you run CHECKD.

SOFTWARE TASKS

5.2.7 Mounting a Structure with SMOUNT

To request that a structure be mounted, use the SMOUNT command.

----- Example -----

To request that structure SNARK be mounted:

```
@SMOUNT SNARK
```

This command specifies a structure whose physical identification is SNARK and whose alias, while the structure is mounted, is also SNARK.

To mount a structure whose physical identification is identical to the alias of a structure already mounted, you must specify a different alias for the structure you want to mount. (While this structure is mounted, users must refer to it with the different alias that you specified for the structure.)

To specify a different alias in the mount request, type the following to PTYCON.

1. CONNECT 0
2. ENABLE
3. SMOUNT alias,
4. STRUCTURE-ID physical identification
5. An additional carriage return
6. DISABLE
7. CTRL/X

----- Example -----

To request that a structure named SNARK be mounted with an alias of CHECK:

```
PTYCON> CONNECT 0
[CONNECTED TO SUBJOB 0(5)]
@ENABLE
$SMOUNT CHECK,
$$$STRUCTURE-ID (IS) SNARK
$$
WAITING FOR STRUCTURE CHECK: TO BE PUT ON LINE...
STRUCTURE CHECK: MOUNTED
$DISABLE
@^X
PTYCON>
```

SOFTWARE TASKS

----- Hint -----

The ability to mount two different structures of the same name by specifying a different alias for one of them is useful when someone brings you a structure to mount and there is a structure of the same name already mounted.

----- Requirement -----

To specify an alias different from the physical identification of a structure, you must have OPERATOR, WHEEL, or MAINTENANCE capability enabled.

----- Error Message -----

?SMOUNT REQUEST DENIED -- THE REASON GIVEN:
OPERATOR, WHEEL, OR MAINTENANCE CAPABILITY REQUIRED TO SPECIFY
STRUCTURE-ID DIFFERENT THAN ALIAS

You must have OPERATOR, WHEEL, or MAINTENANCE capability enabled to specify an alias different from the physical structure identification. Log in under OPERATOR, which should have OPERATOR capability, and type ENABLE before you give the SMOUNT.

SOFTWARE TASKS

5.2.8 Removing a Structure

If you need to remove a structure from the system, perhaps to have maintenance done on a drive, to run CHECKD on a structure, or to mount another structure, perform the following procedures in the order given.

1. Whenever OPLEAS outputs a list of packs available for removal, check if the structure you want to remove is in the list. If it is, you can remove all the packs in the structure before you respond to the current OPLEAS request. If it is not in the list, go to procedure 2.
2. If the structure does not appear in the available list, do the following:
 - a. Type CONNECT 0 to PTYCON.
 - b. Type ENABLE.
 - c. Type ^ESET STRUCTURE name: UNAVAILABLE, so that no user can SMOUNT the structure and no batch or print request is scheduled for that structure.
 - d. If you intend to run CHECKD on the structure, also type ^ESET STRUCTURE name: IGNORED.
 - e. Use ^ESEND to notify all users to SDISMOUNT the structure by a certain time.
 - f. Type DISABLE.
 - g. When the time is up, type SREMOVE name:.
 - h. Type CTRL/X.
 - i. If OPLEAS outputs the structure name in the list of packs available for removal, immediately set one pack of the structure off-line (to let OPLEAS continue handling other requests). Otherwise, go to procedure 3.
 - j. Either remove all packs of the structure from the drives, or put all the packs of the structure on-line to run CHECKD on the structure.

SOFTWARE TASKS

3. If the structure doesn't appear in the list (item i. above), you can forcibly dismount the structure. Type CONNECT 0 to PTYCON and do the following:
 - a. Type INFORMATION STRUCTURE name:.
 - b. Type ENABLE.
 - c. Use ^ESEND to give those users of the structure a last warning to SDISMOUNT the structure.
 - d. Type ^ESET STRUCTURE name: DISMOUNTED.
 - e. Type DISABLE.
 - f. Type SREMOVE name:.
 - g. Because the structure now appears in the OPLEAS output of packs available for removal, either remove all packs of the structure from the drives, or put all the packs of the structure on-line to run CHECKD on the structure.

----- Hints -----

See Appendix A for more information on ^ESET STRUCTURE commands.

When you want OPLEAS to mount a structure that has been set IGNORED, set the structure to be ACKNOWLEDGED.

----- Example -----

If you want to remove a structure XYZ from the system by 4p.m., and there are currently users of the structure, declare the structure UNAVAILABLE about ten minutes before 4p.m.. Then warn users to SDISMOUNT XYZ.

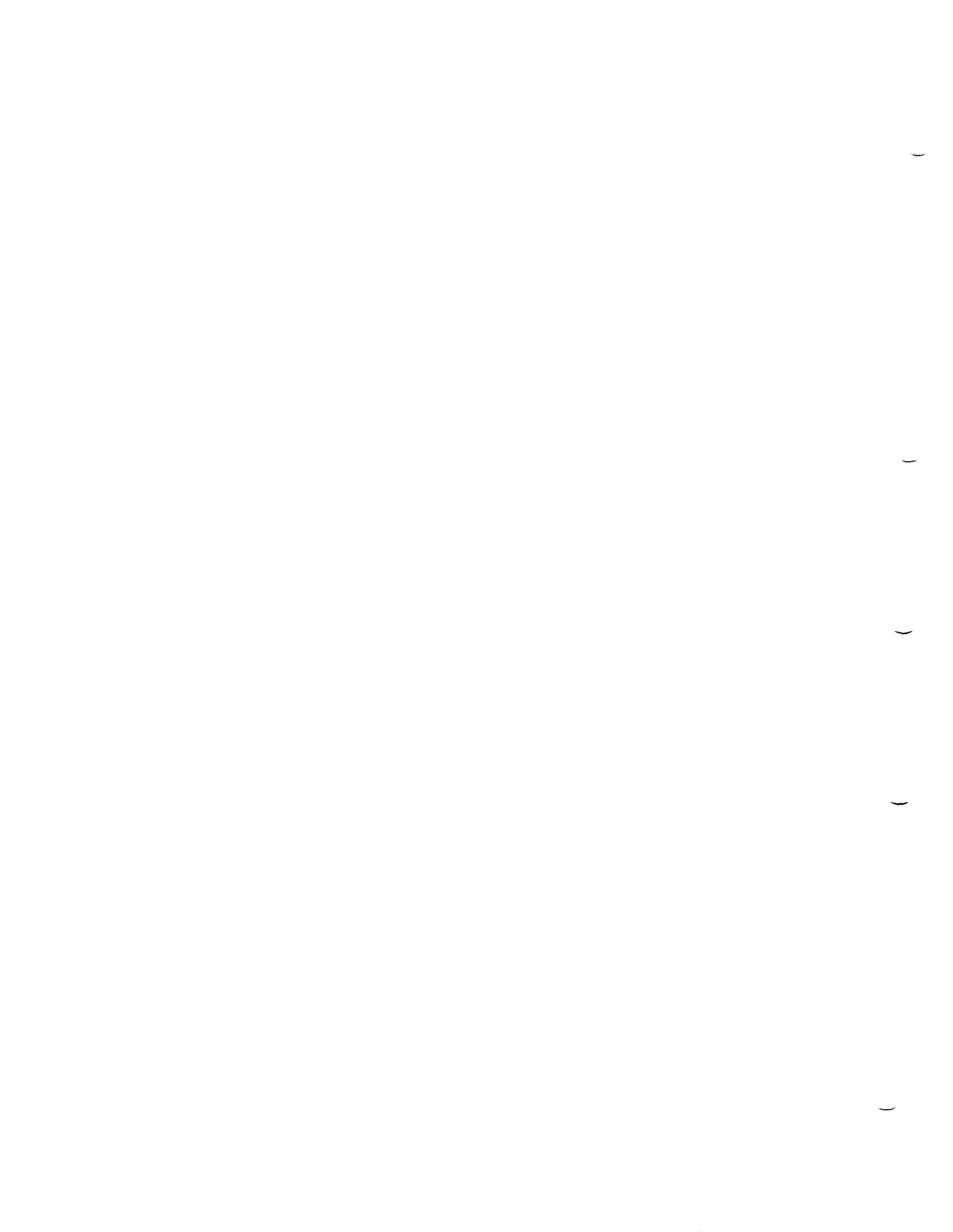
```
@ENABLE
$^ESET STRUCTURE (NAME) XYZ: (TO BE) UNAVAILABLE (TO NEW USERS)
$^ESEND * FINISH USING XYZ AND SDISMOUNT IT IN 10 MIN.

[FROM OPERATOR: FINISH USING XYZ AND SDIMOUNT IT IN 10 MIN.]
$DISABLE
```

At 4p.m. try the SREMOVE.

```
@SREMOVE XYZ
```

OPLEAS then outputs the structure in the list of packs available for removal, so the structure can be removed.



CHAPTER 6

ERROR RECOVERY PROCEDURES

While the system is running, unexpected errors may occur. Sometimes the system tries to recover, but sometimes you may have to take corrective action. This chapter describes some of the more likely errors you will encounter and how to correct them.

6.1 AUTOMATICALLY RELOADING AND DUMPING THE SYSTEM

Because there is one monitor for the main processor (TOPS-20) and another for the console front-end processor (RSX-20F), it is possible for either one to crash (halt or hang) and for either one to restart the other.

When TOPS-20 halts because of a BUGHLT (Section 6.4.2), it is usually reloaded and started by RSX-20F. During automatic reloading, RSX-20F writes a KLERR entry containing information about the central processor at crash time. Once TOPS-20 is running, this KLERR entry is appended to the ERROR.SYS file (Section 5.1.10). The automatic reloading process also dumps KL memory to the file PS:<SYSTEM>DUMP.EXE. Once TOPS-20 is running again, that file is automatically copied to DUMP.CPY with a new generation number so that successive memory dumps don't destroy previous ones. DUMP.CPY and its generation number are output on the CTY when the COPY is done.

When RSX-20F halts, it is usually reloaded by TOPS-20. However, some output for the CTY might not get printed. This output includes a BUGCHK or BUGINF, PTYCON output, and PROBLEM ON DEVICE messages. During reload, front-end memory is dumped to the file PS:<SYSTEM>0DUMPl1.BIN.g, where g is the file generation number. On successive dumps, the generation number is increased so that previous dumps aren't overwritten. The filename, including the generation number, is put into ERROR.SYS (Section 5.1.10).

For automatic reload, the front end uses the last bootstrap device used and BOOT.EXB as the KL bootstrap. BOOT.EXB then reads in the default monitor, PS:<SYSTEM>MONITR.EXE.

When reload occurs, write as much information as possible about the crash in the installation logbook. Include the following:

1. Date and time of the crash
2. TOPS-20 or RSX-20F reload
3. Name of the BUGHLT, if any

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4. Names of the files containing the TOPS-20 monitor before it was run and the memory dump

If your system manager or software contact decides to report the crash to DIGITAL, you must provide the logbook information and a magnetic tape containing both the memory dump and a copy of the TOPS-20 monitor before it was run. For TOPS-20 crashes, the output from SYSERR containing the KLERR information is also important. (See example 8 in Section 5.1.10 to obtain it.)

----- Hint -----

As soon as possible, memory dump files should be put on magnetic tape with DUMPER and deleted from disk to free some space.

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6.2 MANUALLY RELOADING AND DUMPING THE SYSTEM

You must manually reload the system when it is time for a scheduled reload or when the system is hung or looping, i.e., not responding to users.

6.2.1 Scheduled Reloads

For scheduled reloads, you can use the procedure given in Section 3.2.1, 3.2.2, or 3.2.3. However, if the system is running at the time you want to reload, you must:

1. Give a ^ECEASE command (Section 5.1.12) and wait until downtime. At that time, SHUTDOWN COMPLETE is output on the CTY.
2. Type CTRL/\ (control backslash) to enter the console processor command language.
3. Give the SHUTDOWN command.
4. After the **HALTED** message, reload the system.

6.2.2 Reloads and Dumps for Hung or Looping System

Determining whether it is TOPS-20 or RSX-20F that is hung or looping might be difficult. If you are able to get to the console processor command language by typing CTRL/\ (Appendix C), RSX-20F is probably okay. If there is no line printer or card reader action, or a group of terminals aren't responding, the front end is probably hung.

First try the following, assuming that TOPS-20 is looping:

1. Type CTRL/\ to enter the console processor command language. If you don't get to the PARSER, assume the front end is hung and proceed with the steps below for a hung front end. If you get the PARSER prompt, proceed with step 2.
2. Type REPEAT 5;EXAMINE KL to print the current program counter (PC) and the current state of the priority interrupt (PI) system five times. Save this output.
3. Type SHUTDOWN. If you don't get the message **HALTED**, type CTRL/\ and ABORT (RET).
4. Reload via the switch register (Section 3.2.3) to enter the dialog, and answer BOOT to the first question.
5. When BOOT> prompts, type /D (RET) to dump KL memory to the file PS:<SYSTEM>DUMP.EXE. Later the file is automatically copied to another name. When the copy is done, note the filename printed on the CTY.
6. Then press RETURN to load PS:<SYSTEM>MONITR.EXE, or type the name of the monitor to be loaded.
7. Answer questions in the loading procedure (Section 3.2).

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Assuming the front end is hung, try the following:

Manually halt the front end by pressing and then raising the HALT switch to the right of the switch register. Wait 10 to 15 seconds; TOPS-20 will try to reload the front end.

Then consider the following three cases.

1. If RSX-20F reloaded successfully, and everything now seems okay, report the situation to your system manager and software contact. A dump of front-end memory is automatically put into the file PS:<SYSTEM>0DUMP11.BIN.g, where g is the file generation number. The filename, along with the generation number, is entered in ERROR.SYS.
2. If RSX-20F reloaded, but the system still seems to be hung, try the procedure above for TOPS-20 looping.
3. If RSX-20F doesn't reload, i.e., you don't get the following messages:

```
RSX-20F YB10-07A 7:40 31-AUG-77
```

```
[SY0: REDIRECTED TO dev:]  
[dev: MOUNTED]
```

and the console light is on, TOPS-20 is probably looping. You should then follow the procedure above for TOPS-20 looping. You could also wait about five minutes to let TOPS-20 BUGHLT, so that the front end automatically reloads it. However, in this case you lose the EXAMINE KL output. If you let the front end reload TOPS-20, once the system is up, be sure to run SYSERR to get KLERR information (Section 5.1.10, example 8).

----- Hint -----

Be sure to log any reloads in your installation's system logbook. Include the following:

1. Any information about the reason for reloading
2. When and how the reload was done
3. Attachment of EXAMINE KL output, if any
4. Whether KL or front-end memory was dumped and to which files they were dumped

To report the crash to DIGITAL, supply the above information, a copy of the TOPS-20 monitor before it was run, any memory dumps on magnetic tape, and any SYSERR output containing KLERR information.

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6.3 SETTING THE CORRECT DATE AND TIME

If you notice that the date and time output by the system is incorrect, immediately notify your system manager. For accounting purposes, he may want you to reload the system. However, he may want you to correct only the date and time. You can change the date and time with ^ESET DATE-AND-TIME. If you need to set it back, be sure that you first warn all users via ^ESEND that you are going to set it back, because that action may affect their work.

To correct the date and time, type the following to PTYCON.

1. PUSH
2. ENABLE
3. ^ESEND * DATE AND TIME WILL BE SET BACK TO MAKE THEM CORRECT
4. ^ESET DATE-AND-TIME date time
5. POP

(For valid date and time formats, see the ^ECEASE command in Appendix A. Also, for more detail on ^ESET and ^ESEND, see Appendix A.)

----- Hint -----

If you have batch jobs running, you should type RESET or EXIT to BATCON and wait until the current batch jobs have finished before you correct the date and time.

----- Example -----

```
PTYCON> PUSH

TOPS-20 COMMAND PROCESSOR 3(400)
@ENABLE
$^ESEND * DATE AND TIME WILL BE SET BACK TO MAKE THEM CORRECT

[FROM OPERATOR: DATE AND TIME WILL BE SET BACK TO MAKE THEM
CORRECT]
$^ESET DATE-AND-TIME (TO) 21-SEP-77 1047
$POP
PTYCON>
```

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6.4 ERROR MESSAGES AND ACTION TO TAKE

Error messages come from many different sources. Those for particular programs are usually documented along with the task involving that program. The next four sections discuss device error messages; BUGCHKs, BUGINFs, and BUGHLTs from TOPS-20; HOME and BAT block messages from the KL bootstrap and from TOPS-20; and the memory parity error message from TOPS-20.

6.4.1 Device Error Messages

When problems occur on various devices, you will receive on the CTY a message beginning with %PROBLEM ON DEVICE. The message will continue to be output every minute until you correct the problem. The specific messages and their corrective actions are given below.

%PROBLEM ON DEVICE: MTAn, S.N.=s, ACCESS PATH: CHN=c, TM02=t, UNI=u

n = logical unit number
s = serial number
c = channel number
t = TM02 number
u = unit number

There is a problem with the magnetic tape drive, logical unit n. Check if it has lost vacuum, run off the reel, or is not ON LINE. Warn the user if vacuum was lost.

%PROBLEM ON DEVICE PCDR0

There is a problem with the card reader. Check if one of the following error indicators (Figure 7-10) is lit.

1. READ CHECK

A card edge is torn, column 0 or 81 is punched, or two cards were picked at the same time. To correct the problem for a faulty card, remove the card and press RESET to restart the reader. If no cards are faulty, re-read the last two cards in the output stacker. If READ CHECK occurs for every card, notify your field service representative.

2. PICK CHECK

A card's leading edge is damaged, webs are torn, or cards are stapled together. If a card is damaged, remove it and restart the reader by pressing RESET. If no cards are damaged, check for excessive warpage of the card deck or a buildup of ink glaze on the picker face. If webs are torn, notify your field service representative.

3. STACK CHECK

Either a card is badly mutilated or there is a jam in the card track. To fix the problem, remove the bad card or correct the jam and restart the reader by pressing RESET.

4. HOPPER CHECK

Either the input hopper is empty or the output stacker is full. To correct the problem, load the input hopper or unload the output stacker.

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%PROBLEM ON DEVICE PLPTn

There is a problem with the unit n line printer. Check if the printer is ON LINE, has paper, or has any error lights on.

%PROBLEM ON DEVICE: RP0n, STR=t, S.N.=s, ACCESS PATH: CHN=c, UNI=u

n = 4 or 6 for the type of disk drive
t = structure name
s = serial number
c = channel number
u = unit number

There is a problem with a disk drive. Check if it is READY or if any error lights are on. If STNDBY is lit, turn drive power OFF, then ON. If UNSAFE is lit, you should contact your field service representative, as there could be a hardware problem.

----- Example -----

%PROBLEM ON DEVICE: MTA1, S.N.=0024, ACCESS PATH: CHN=0, TM02=5, UNI=2

6.4.2 BUGCHKs, BUGINFs, and BUGHLTs

When TOPS-20 encounters certain questionable situations, a BUGCHK or BUGINF occurs. Then, some informational messages are output on the CTY, and TOPS-20 continues.

When TOPS-20 encounters a situation from which it is not advisable to continue, a BUGHLT occurs. TOPS-20 is then reloaded and started by the front end.

When a BUGCHK is encountered, the following is output on the CTY:

```
*****  
*BUGCHK "name" AT dd-mmm-yy hh:mm:ss  
*message  
*JOB: n, USER: user-name  
*ADDITIONAL DATA: data, data, data  
*****
```

The lines beginning with JOB: or ADDITIONAL DATA: may not appear. The system then continues.

The output is similar for BUGINFs.

----- Examples -----

```
*****  
*BUGCHK "TM2CCI" AT 16-SEP-77 13:22:17  
*PHYM2 - TM02 SSC OR SLA WONT CLEAR  
*JOB: 5, USER: OPERATOR  
*****  
  
*****  
*BUGCHK "P2RAE1" AT 16-SEP-77 13:26:32  
*PHYH2 - RH20 REGISTER ACCESS ERROR READING REGISTER  
*ADDITIONAL DATA: 10005210602, 407415  
*****
```

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NOTE

After a power-fail restart, BUGCHK "PWRRES", the system continues, but all jobs that were attached to a terminal are detached. If the detached jobs are not attached to within five minutes, they are logged out.

When a BUGHLT occurs the following is output on the CTY.

```
%DECSYSTEM-20 NOT RUNNING
```

```
*****  
*BUGHLT "name"  
*****
```

You can find the message corresponding to "name" in Appendix D. The message is not output on the CTY. The TOPS-20 monitor is then reloaded and started by the front end.

----- Example -----

```
%DECSYSTEM-20 NOT RUNNING
```

```
*****  
*BUGHLT "JONRUN"  
*****
```

```
KL HALTED
```

```
RE-BOOT REQUESTED  
KLERR -- VERSION Y02-00 RUNNING  
KLERR -- KL IN HALT LOOP  
KLERR -- KL ERROR OTHER THAN CLOCK ERROR STOP  
KLERR -- KL VMA: 000000 065334 PC: 000000 065334  
KLERR -- PI STATE: OFF , PI ON: 177 , PI HLD: 000 , PI GEN: 000  
KLERR -- EXIT FROM KLERR  
KLI -- VERSION YB05-03 RUNNING  
KLI -- BOOTSTRAP LOADED AND STARTED
```

```
[PS MOUNTED]
```

This is followed by other messages as in normal system loading.

The names of all BUGCHKs and BUGHLTs are given in Appendix D. Whenever the system encounters one beginning with DIR and then outputs the directory number after ADDITIONAL DATA, you should rebuild the directory's symbol table (Section 6.5.1).

NOTE

When the front end crashes, it is reloaded and [DECSYSTEM-20 CONTINUED] is output. You do not get a BUGHLT, but you may have to retype some of your last input.

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6.4.3 HOME or BAT Block Inconsistencies

When the KL bootstrap is loaded and started, it checks the primary HOME blocks on the disk packs for certain information. It checks if the public structure has been mounted and if the public structure contains all the proper units for the structure.

If the public structure has not been properly mounted, you may get the following error messages from the bootstrap.

?DUPL STR UNI

There are two mounted disk packs claiming to have the same logical unit number in the structure. Check to see that you have the proper disk packs mounted.

?HOM BLKS BAD

A logical unit number is out of range. Check that the proper packs have been mounted.

?MISSING UNIT

One or more logical units are missing from the structure. Check that the proper packs are mounted.

After any of the above errors, BOOT prompts again. To load a TOPS-20 monitor, type the monitor filename or press RETURN to get the default. To dump KL memory, type /D RET. If the proper packs are mounted and an error still occurs, consult your software contact or field service representative.

Once the bootstrap is loaded and started, the TOPS-20 monitor also checks the HOME blocks on the disk packs. The following messages may occur.

----- Warning Messages -----

% BACKUP HOME BLOCK ON PS
LOGICAL UNIT n IS INCORRECT

The monitor continues to run using the other HOME block. Notify your system manager.

% PRIMARY HOME BLOCK ON PS
LOGICAL UNIT n IS INCORRECT

The monitor continues to run using the other HOME block. Notify your system manager.

----- Error Messages -----

? INCONSISTENT SET OF PACKS COMPOSING STRUCTURE PS.

This is like the ?HOM BLKS BAD message from the bootstrap. A logical unit number is out of range. Because the bootstrap did not get the error, there may be hardware problems.

? LOGICAL UNIT n MISSING FROM STRUCTURE PS.

This is like the ?MISSING UNIT message from the bootstrap. A logical unit number is missing from the structure. Because the bootstrap did not get the error, there may be hardware problems.

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? LOGICAL UNIT n OF STRUCTURE PS IS WRITE LOCKED.

Write-enable the pack.

? MORE THAN 1 LOGICAL UNIT n IN STRUCTURE PS

This is like the ?DUPL STR UNI message from the bootstrap. Two packs claim to have the same logical unit number in the structure. Because the bootstrap did not get the error, there may be hardware problems.

After any of the above four errors, check that you have the proper packs mounted. Then when you get the message HAVE THE PROBLEMS MENTIONED ABOVE BEEN CORRECTED YET:, if you believe you have corrected them, type Y to continue.

The TOPS-20 monitor also checks the BAT (bad allocation table) blocks on the disk packs. The BAT blocks indicate what areas of the disk have been found to be bad. The following messages may occur.

----- Warning Messages -----

%BAT BLOCK FULL ON PS UNIT n

The monitor continues to run with no space in the BAT block to mark bad areas of the disk. Inform your field service representative so that he can correct the problem. You will then probably have to reformat the pack and re-create the file system.

%BAT BLOCKS DO NOT COMPARE ON PS UNIT n

The BAT blocks on unit n look valid, but they aren't exactly the same. When BAT blocks are updated, the primary one is done first. Therefore, if the system crashes before the secondary one is updated, they are different. In this case, the primary BAT block is copied into the secondary one.

%COPYING PRIMARY BAT BLOCKS TO SECONDARY ON PS UNIT n

See explanation above.

%COPYING SECONDARY BAT BLOCK TO PRIMARY ON PS UNIT n

If the primary BAT block is not valid, the secondary one is copied to it.

----- Error Message -----

?PS UNIT n HAS NO CONSISTENT BAT BLOCKS

The monitor continues assuming that the structure was built to not have BAT blocks.

Once the system succeeds in the HOME and BAT block check, it prints:

[PS MOUNTED]

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6.4.4 Memory Parity Errors

When TOPS-20 encounters a memory parity error, it prints out the message:

```
MPE DETECTED BY    x, PC=n, y
```

where x is a device or APR, n is the PC value, and y is either MONITOR or USER.

Then, it outputs:

```
ERA = m
```

where m is a number containing a code and a 22-bit address.

Then, it outputs:

```
LOC    CONTENTS
```

This is followed by a list of locations and their contents for addresses where bad parity was found.

Then, it outputs:

```
z ERRORS FOUND
```

where z is some number or the word NO.

Other applicable information is then output.

The monitor then encounters the MPEDEV BUGCHK or the FATPER BUGHLT.

All of the above information is entered in ERROR.SYS (Section 5.1.10) and may be useful to your field service representative.

If many of these parity errors occur, you should notify your field service representative to investigate.

NOTE

As memory parity errors occur, the system dynamically decides not to use the affected pages.

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6.5 RECOVERING THE FILE SYSTEM

Problems with different degrees of severity that can occur in the file system. The following sections discuss the simple cases of rebuilding a directory symbol table (Section 6.5.1) and reconstructing a directory (Section 6.5.2), the more complex cases of reconstructing the ROOT-DIRECTORY (Section 6.5.3) and re-creating a structure (Section 6.5.4), and the most complex case of re-creating the entire file system (Section 6.5.4).

6.5.1 Rebuilding a Directory Symbol Table with EXPUNGE

When TOPS-20 processes a BUGCHK, BUGINF, or BUGHLT beginning with DIR, and outputs the number of the directory and its structure in sixbit after ADDITIONAL DATA, try to rebuild the directory symbol table.

NOTE

For directory number 1 (ROOT-DIRECTORY),
you must refer to Section 6.5.3.

To rebuild a directory symbol table, do the following:

1. Look at the two numbers after ADDITIONAL DATA. Use the second number to determine the structure in the following procedure. At system command level, type:

```
DDT (RET)
0/      second number (RET)
.$6T/      CTRL/C
```

The \$ above means press ESCAPE. After the 0/, DDT outputs a value that you can ignore. After .\$6T/, DDT outputs the name of the structure. For example, if you saw:

```
ADDITIONAL DATA: 3, 606300000000
```

your DDT work should look like:

```
@DDT
DDT
0/ 0      606300000000
.$6T/    PS      ^C
@
```

2. Find the directory name corresponding to the directory number, i.e., the first number after ADDITIONAL DATA. Do this by looking at a numeric ULIST listing (Section 5.1.7.3) for the proper structure.
3. Then CONNECT to 0, a subjob of PTYCON, and type:

```
ENABLE
EXPUNGE structure:<directory>,
REBUILD
(RET)
```

where structure and directory are names, not numbers.

Rebuilding the symbol table should eliminate any further BUGs for that directory. If it doesn't, reconstruct the directory (Section 6.5.2).

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6.5.2 Reconstructing a Directory

If there was a problem with a directory and the procedures in Section 6.5.1 did not eliminate the problem, you must reconstruct the directory by doing the following:

1. Try to save the directory's files with DUMPER.

NOTE

If the directory is a critical one, for which there is no acceptable backup, and you cannot save the files with DUMPER, notify a DIGITAL software specialist. He might be able to recover most or all of the directory's contents.

2. Kill the directory with ^ECREATE and the KILL subcommand. If that fails, see Section 6.5.2.1 to delete the directory with the DELETE command.
3. Continue with Section 6.5.2.2 to re-create the directory and restore its files.

6.5.2.1 Deleting a Directory - If you must reconstruct a bad directory and you cannot kill it with ^ECREATE, type the following:

1. CONNECT 0
2. ENABLE
3. DELETE structure:file specification,

NOTE

Do not forget the "," after the file specification.

4. DIRECTORY
5.
6. DISABLE
7. CTRL/X

Structure is the name of the structure containing the bad directory. Determine the file specification by doing the following on a piece of paper.

1. Write the name of the bad directory. Some examples might be:

```
<MUMBLE.FOO>  
<COT>  
<A.YOW.1>
```

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2. If the name of the bad directory does not contain a ".", use "ROOT-DIRECTORY." as a prefix for the name. For example,

<COT> becomes <ROOT-DIRECTORY.COT>

3. The name now contains a "." either because it did originally or because of step 1. Scan the name until you find the last ".". Replace the "." with ">". For example,

<MUMBLE.FOO> becomes <MUMBLE>FOO>
<ROOT-DIRECTORY.COT> becomes <ROOT-DIRECTORY>COT>
<A.YOW.l> becomes <A.YOW>l>

4. Replace the final ">" with ".DIRECTORY". For example,

<MUMBLE>FOO> becomes <MUMBLE>FOO.DIRECTORY
<ROOT-DIRECTORY>COT> becomes <ROOT-DIRECTORY>COT.DIRECTORY
<A.YOW>l> becomes <A.YOW>l.DIRECTORY

Then type the file specification you obtained at the end of Step 4 in the procedure for deleting a directory.

If you typed the DELETE command and got the message:

```
name.DIRECTORY FILE CANNOT BE EXPUNGED BECAUSE IT IS CURRENTLY OPEN
```

plan to stop timesharing by doing a ^ECEASE. After the downtime you specified in ^ECEASE occurs, type EXIT to PTYCON. Then type:

1. DELETE structure:file specification,
2. DIRECTORY
3.
4. ^ESET LOGINS ANY
5. ^ESET OPERATOR-IN-ATTENDANCE
6. PTYCON
7. GET SYSTEM:PTYCON.ATO

----- Example -----

To delete the bad directory <MUMBLE.FOO> on structure PS:.

```
PTYCON>CONNECT 0  
[CONNECTED TO SUBJOB 0(4)]  
ENABLE  
$DELETE PS:<MUMBLE>FOO.DIRECTORY,  
$$DIRECTORY  
$$  
$DISABLE  
@^X  
PTYCON>
```

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6.5.2.2 **Re-Creating a Directory and Restoring Its Files** - After you have killed or deleted a directory needing reconstruction, do the following:

1. To re-create the directory, run DLUSER to load the latest file you dumped with DLUSER for the structure involved.
2. To restore the files of the directory you killed or deleted, use the DUMPER save you just did in Section 6.5.2, Step 1, or the most recent DUMPER magnetic tape containing those files and run DUMPER to restore them (Section 5.2.2).
3. If you deleted the directory, run CHECKD with the CHECK BITTABLE command and then with the RELEASE command to release lost pages.

NOTE

Never run CHECKD with the RELEASE command if a directory needs reconstruction. First, reconstruct the directory.

6.5.3 Reconstructing the Root Directory

When you get a BUGCHK or BUGHLT beginning with DIR that involves directory number 1, or when you get the BUGHLT BADROT, BADXT1, FILIRD, or FILMAP, try reconstructing <ROOT-DIRECTORY>. Notify your system manager and software contact of this before you do anything.

To determine the structure involved, see step 1 of Section 6.5.1. If the structure is not PS, run CHECKD with the RECONSTRUCT ROOT-DIRECTORY command (Section 6.7) and specify the proper structure. If the structure is PS, you must instruct the system to use the backup <ROOT-DIRECTORY> and rebuild <ROOT-DIRECTORY> by doing the following:

1. Type CTRL/\ to enter the PARSE.
2. Type SHUTDOWN to the PARSE.
3. Mount System Floppy C in drive 0.
4. Mount System Floppy B in drive 1.
5. Mount your most recent system backup tape on MTA0 (Section 5.1.6.1). If you do not have a system backup tape, use System Magtape D.
6. Be sure the front-end HALT switch is in the ENABLE position.
7. Set switches 0, 1, and 2 in the switch register.
8. Press the switches SW REG and ENABLE simultaneously.
9. Type YES to ENTER DIALOG.
10. Type YES to RELOAD MICROCODE.
11. If your system is a 2050, which has cache, you will see RECONFIGURE CACHE; type ALL.

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12. Type ALL to CONFIGURE KL MEMORY.
13. Type MTBOOT to LOAD KL BOOTSTRAP.
14. Type /L after BOOT>.
15. Type /G143 after BOOT>.
16. Type N to DO YOU WANT TO REPLACE THE FILE SYSTEM ON THE PUBLIC STRUCTURE.
17. Type Y to RECONSTRUCT ROOT-DIRECTORY.
18. Type the current date and time after ENTER CURRENT DATE AND TIME.
19. Type Y to IS THIS CORRECT if you entered the correct date and time. Otherwise, type N and enter the date and time again.
20. Type RECONSTRUCT ROOT-DIRECTORY after WHY RELOAD.

Then CHECKD runs and outputs:

```
[REBUILDING BIT TABLE]
```

```
[WORKING ON STRUCTURE - PS:]
```

The remaining output is the same as in any system load (Section 3.2).

----- Example -----

```
PAR>SHUTDOWN
**HALTED**

%DECSYSTEM-20 NOT RUNNING

RSX-20F YB10-07A 7:40 31-AUG-77

[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>YES
KLI -- MICROCODE VERSION 173 LOADED
KLI -- RECONFIGURE CACHE [FILE,ALL,YES,NO]?
KLI>ALL
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI>ALL
LOGICAL MEMORY CONFIGURATION
          CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 128K  00  01  00  01    MA20   4
KLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
KLI>MTBOOT
KLI -- CONFIGURATION FILE ALTERED
KLI -- BOOTSTRAP LOADED AND STARTED

BOOT>/L

BOOT/G143
```

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[FOR ADDITIONAL INFORMATION TYPE "?" TO ANY OF THE FOLLOWING QUESTIONS.]

DO YOU WANT TO REPLACE THE FILE SYSTEM ON THE PUBLIC STRUCTURE? N

[PS MOUNTED]
RECONSTRUCT ROOT-DIRECTORY? Y

[RECONSTRUCTION PHASE 1 COMPLETED]

SYSTEM RESTARTING, WAIT...
ENTER CURRENT DATE AND TIME: 29-SEP-77 10:25

YOU HAVE ENTERED THURSDAY, 29-SEPTEMBER-1977 10:25AM,
IS THIS CORRECT (Y,N) Y
WHY RELOAD? RECONSTRUCT ROOT-DIRECTORY
[REBUILDING BIT TABLE]

[WORKING ON STRUCTURE - PS:]

.
.
.

6.5.4 Re-Creating the File System or a Structure

You should re-create the file system or a structure only when:

1. You have tried reconstructing <ROOT-DIRECTORY>, but the file system or structure is still in such bad shape that the system or structure cannot be used, and
2. Your system manager has agreed that you should re-create the file system or structure.

If reconstructing PS:<ROOT-DIRECTORY> didn't solve the problem, you must re-create the file system, i.e., both the public structure and front-end file system. (Refer to Section 6.5.4.1.) If reconstruction of a ROOT-DIRECTORY on any other structure didn't succeed in solving the problem, just re-create that structure. (Refer to Section 6.5.4.2.)

6.5.4.1 Re-Creating the Public Structure and Front-End File System -

You should re-create the file system on the public structure only at your system manager's request or approval. This request will usually come if the file system is in such bad shape that the system cannot be used and reconstruction of the <ROOT-DIRECTORY> failed to correct the problem.

To re-create the file system on the public structure, you need:

1. The disk packs your system manager chooses for the new file system
2. The latest system backup tape (Section 5.1.6.1)
3. The latest DUMPER magnetic tapes (full and incremental saves) of the public structure

ERROR RECOVERY PROCEDURES

4. The DECSYSTEM-20 Software Installation Guide
5. System floppies B and C

Then do the following:

1. Type CTRL/\.
2. Type SHUTDOWN.
3. Mount system floppy C in drive 0.
4. Mount system floppy B in drive 1.
5. Mount your latest system backup tape on MTA0. If you do not have a backup tape, use System Magtape D.
6. Follow Steps 11 (Set the Switch Register to 7) through 47 (Give the DUMPER Command: TAPE MTA0:) of Chapter 3 in the DECSYSTEM-20 Software Installation Guide.
7. After DUMPER> type RESTORE PS:<*>*. *.* (TO) .
8. Again, after DUMPER> type RESTORE PS:<*>*. *.* (TO) .
9. After DUMPER> type REWIND.
10. Remove the tape on MTA0, and mount the first tape of your latest full DUMPER save.
11. After DUMPER> type CREATE.

NOTE

The CREATE command to DUMPER can cause a directory to be restored with a different directory number than it previously had.

12. After DUMPER> type RESTORE (MTA FILES) PS:<*>*. *.* (TO) .
13. If there are additional tapes, mount the next tape of the save after the previous tape has been read. Then type TAPE MTAn:, where n is the number of the drive on which you mounted the next tape to be read. Repeat this step until all tapes of the save have been read.
14. If there are incremental saves, you must restore them too. For each save repeat steps 11, 12, and 13.
15. Re-create the front-end file system by following the directions in Chapter 5 of the DECSYSTEM-20 Software Installation Guide.
16. Reload the system using the DISK and ENABLE load switches (Section 3.2.1).

ERROR RECOVERY PROCEDURES

6.5.4.2 **Re-Creating Other Structures** - If a structure other than PS: had problems and <ROOT-DIRECTORY> reconstruction did not fix them, at your manager's request or approval, you must re-create that structure. Then restore its directories and files. This entire procedure can be done during timesharing. First, be sure you have:

1. The disk packs your system manager chooses for the new structure
2. The latest DUMPER magnetic tapes (full and incremental saves) for that structure

Then, do the following:

1. Type CONNECT 0 to connect to subjob 0 under PTYCON.
2. Type ENABLE.
3. Follow the procedures in Section 5.2.6 to create the structure.
4. Type SMOUNT str: to mount the structure, where str is the name of the structure.
5. Type ^ESET STRUCTURE str: UNAVAILABLE to prevent other users from SMOUNTing the structure.
6. Type DLUSER.
7. Type LOAD SYSTEM:str.TXT to restore directory parameters. You should have previously saved these parameters (Section 5.1.6.2).
8. Type ASSIGN MTAn:, where n is an available magnetic tape drive.
9. Mount the first tape of your latest full DUMPER save for this structure on MTAn.
10. Type DUMPER.

NOTE

See Hint below.

11. After DUMPER> type TAPE MTAn:, where n is the number of the drive you assigned.
12. After DUMPER> type CREATE.

NOTE

The CREATE command to DUMPER can cause a directory to be restored with a different directory number than it previously had.

ERROR RECOVERY PROCEDURES

13. After DUMPER> type RESTORE (MTA FILES) str:<*>*. *.* (TO) RET .
14. If there are additional tapes, mount the next tape of the save after the previous tape has been read. Then type TAPE MTAn:, where n is the number of the drive on which you mounted the next tape to be read. Repeat this step until all tapes of the save have been read.
15. If there are incremental saves, you must restore them too. For each save repeat steps 12, 13, and 14.
16. Type ^ESET STRUCTURE str: AVAILABLE to allow other users to SMOUNT the structure.
17. Type CTRL/X.

----- Hint -----

If the DUMPER tapes have files with accounts not in the installed ACCOUNTS-TABLE.BIN file, you must restore the tapes while account validation is disabled. To do this:

1. Stop timesharing with ^ECEASE.
2. Type PUSH to PTYCON
3. Edit n-CONFIG.CMD to have DISABLE ACCOUNT-VALIDATION. (See the DECSYSTEM-20 Software Installation Guide, Chapter 4, to edit n-CONFIG.CMD.)
4. Type CTRL/\ and SHUTDOWN.
5. Reload the system.
6. Attach to PTYCON.
7. Type PUSH to PTYCON.
8. Type ENABLE and ^ESET NO LOGINS-ALLOWED ANY.
9. Follow steps 10 through 15 above.
10. Edit n-CONFIG.CMD to have ENABLE ACCOUNT-VALIDATION.
11. They CTRL/\ and SHUTDOWN.
12. Reload the system.

Alternatively, the files may be restored using your current account, i.e., the account set in your last LOGIN or SET ACCOUNT command. However, all files on the structure will have that account. To do this, follow the preceding steps, but type ACCOUNT SYSTEM-DEFAULT before the RESTORE command.

ERROR RECOVERY PROCEDURES

6.6 DIAGNOSING YOUR SYSTEM FROM A REMOTE LOCATION VIA KLINIK

To allow a DIGITAL field service representative or a software specialist to diagnose a problem in your system from a remote location, you must allow access via the KLINIK link. First, determine the following with the person doing the diagnosis.

1. Usage of the link -- a timesharing terminal or remote CTY
2. Password, if usage is a remote CTY
3. Time period to access the KLINIK link
4. Highest console mode

Then type:

1. CTRL/\
2. SET KLINIK
3. USER or REMOTE
4. Password, if you typed REMOTE above
5. Access window open date
6. Access window open time
7. Access window close date
8. Access window close time
9. Highest console mode, if you typed REMOTE above
10. QUIT

----- Example -----

This example shows the SET KLINIK command used to allow the KLINIK link to be used as a remote CTY, to establish the password FGH for gaining access, to allow access between the current time and 24 hours later, and to allow MAINTENANCE as the highest console mode.

```
PAR>SET KLINIK
KLINIK MODE: REMOTE
PASSWORD: FGH
ACCESS WINDOW OPEN DATE: (RET)
ACCESS WINDOW OPEN TIME: (RET)
ACCESS WINDOW CLOSE DATE: (RET)
ACCESS WINDOW CLOSE TIME: (RET)
HIGHEST CONSOLE MODE: MAINTENANCE
KLINIK INACTIVE
ACCESS WINDOW OPEN: 20-SEP-77 12:47
ACCESS WINDOW CLOSED: 21-SEP-77 12:47
KLINIK MODE: REMOTE
HIGHEST CONSOLE MODE: MAINTENANCE
PAR>QUIT
```

ERROR RECOVERY PROCEDURES

6.7 CORRECTING DISK SPACE WITH CHECKD

CHECKD is run automatically at system load time if certain problems were previously found on the public structure. CHECKD is also run when you answer YES to the RUN CHECKD question at system load time or when you type the following to PTYCON.

1. CONNECT 0
2. ENABLE
3. CHECKD
4. Commands to CHECKD separated by
5. EXIT command to CHECKD
6. DISABLE
7. CTRL/X

The following commands can be given to CHECKD. If you do not specify a structure in the command, CHECKD uses your currently connected structure. Note that at any time while CHECKD is processing directories, you can type CTRL/A to find out the name of the directory currently being checked.

CAUTION

Before you run CHECKD on PS:, the public structure, be sure that you have only one structure named PS: on the disk drives. Otherwise, there can be confusion over which structure is used.

If your system has two structures named PS: on-line, where one is just spinning and the other is already recognized by the system, i.e., mounted as the public structure, and you want to run CHECKD on PS:, CHECKD will choose the structure that is just spinning. If CHECKD does not find a PS: that is just spinning, it will use the public structure.

CHECK BITTABLE (CONSISTENCY OF) structure:

NOTE

Issue the CHECK BITTABLE command only when no other users are on the system.

This command causes the structure's bit table, which indicates what disk space is used, to be checked against the disk space that each file on the structure claims to have used. Any discrepancies are listed on your terminal, and the addresses of lost pages are written into the file str:<dir>str-LOST-PAGES.BIN, where str and dir are your connected structure and directory. This command also performs the function of CHECK DIRECTORY. (See Section 6.7.1 for more detail on CHECK BITTABLE.)

ERROR RECOVERY PROCEDURES

KLR -- KLINIK LINE CONNECTED TO TOPS-20

This message is output on the CTY and the remote KLINIK terminal when a remote KLINIK user is trying to gain access to the KLINIK link in USER KLINIK MODE. The remote KLINIK terminal can then be used for timesharing on TOPS-20.

KLR -- KLINIK LOGON TIMEOUT -- LOGON ABORTED

KLD -- KLINIK LINE DISCONNECTED

If you have specified REMOTE KLINIK MODE in the last SET KLINIK command and the remote KLINIK user can't supply the correct password in five attempts within two minutes, this message is output on the CTY and the remote KLINIK terminal. The remote KLINIK user must dial again and go through the validation sequence again to try to gain KLINIK access.

KLR -- KLINIK RING - KLINIK WINDOW CLOSED

This message is output on the CTY and the remote KLINIK terminal when a remote user tries to gain access to the KLINIK link but the access window is closed or not defined.

KLR -- KLINIK RING -- VALIDATING ACCESS

If you specified REMOTE KLINIK MODE in the last SET KLINIK command and a remote user has just dialed to try to gain access to the KLINIK link, this message is output on the CTY.

SAV -- *DIAG* -- KLINIK LINE ACTIVE IN USER MODE

This message is output on the CTY and the remote KLINIK terminal if RSX-20F is reloaded and the KLINIK link is active in user mode.

SAV -- *DIAG* -- KLINIK LINE ACTIVE IN REMOTE MODE

SAV -- *DIAG* -- KLINIK LINE CONNECTED TO SYSTEM CONSOLE

This message is output on the CTY and the remote KLINIK terminal if RSX-20F is reloaded and the KLINIK link is active in remote mode.

SAV -- *FATAL* -- PROTOCOLS NOT RUNNING

There might be a serious software or hardware problem. However, first try reloading the system.

ERROR RECOVERY PROCEDURES

RELEASE (LOST PAGES FROM) file specification (FOR) structure:

This allows you to free lost pages while other users are on the system. When CHECKD reports lost pages, you should first resolve any errors indicated by CHECKD (Section 6.7.1) and run CHECKD again with CHECK BITTABLE to see if errors are gone. Then, run CHECKD under <OPERATOR> and use this command. Press RETURN for the file specification to indicate the file str:<dir>str-LOST-PAGES.BIN.n, where str and dir are your currently connected structure and directory, and n is the latest generation of the file. You may also type the name of the file.

Then, after you EXIT from CHECKD, type:

EXPUNGE

to expunge all generations of the file.

NOTE

If a directory needs reconstruction, reconstruct it and issue the CHECK BITTABLE command before you ever use RELEASE.

Use the RELEASE command with only the most current generation of the lost pages file.

SCAN (FOR DISK ADDRESSES IN) file specification (FOR) structure:

This scans for the addresses specified in the file. Instead of giving a file containing the addresses, you can type TTY: , type addresses separated by , and end with CTRL/Z. The output from the command indicates which files contain the disk addresses specified. This command is especially important if the CHECK BITTABLE function outputs a message indicating that an address is multiply assigned.

The SCAN function can be run during timesharing, but it may produce some extraneous output. Therefore, you should run it with no other users on the system.

Whenever CHECKD finds a multiply-assigned address, you should do the following as soon as possible.

1. Give the ^EASE command to stop timesharing as soon as possible.
2. Type EXIT to PTYCON.
3. Run CHECKD.
4. Give the SCAN command to CHECKD and specify the multiply-assigned address/addresses as indicated above. When CHECKD finds an address for which it is searching, it outputs a message like the error report at the beginning of Section 6.7.1. The error field contains FOUND DISK ADDRESS. For each file in which CHECKD found an address, it outputs a summary line of the form:

n SEARCH ADDRESSES FOUND.

ERROR RECOVERY PROCEDURES

NOTE

If you see in the error report any messages with MULTIPLY ASSIGNED DISK ADDRESS (meaning the address is used by more than one file), take immediate action. Refer to the SCAN command to CHECKD (later in this section), and perform the steps discussed there.

CHECK DIRECTORY (CONSISTENCY OF) structure:

This checks the validity of certain information in each directory on the structure. If an error occurs, the monitor rebuilds the symbol table on the specified structure and recomputes the amount of disk space used for directories needing such action. If a symbol table is being rebuilt, CHECKD outputs:

```
% REBUILDING SYMBOL TABLE FOR structure:<directory>
```

If the rebuild is successful, CHECKD then outputs [OK] at the end of the message. Otherwise, it outputs [FAILED].

CREATE (NEW FILE SYSTEM FOR) structure:

This creates the file structure specified with parameters that you specify to a series of questions asked by CHECKD. (See Section 5.2.6 for more detail.)

EXIT (TO MONITOR)

This returns you to system command level.

HELP

This prints out a help text.

REBUILD (BIT TABLE OF) structure:

This function is for use by your software contact. It is not recommended for operator use. It causes the bit table on the specified structure to be completely rebuilt.

NOTE

Before using REBUILD, be sure that no one else is using the structure. Also, if a directory needs reconstruction, reconstruct it before you use REBUILD.

RECONSTRUCT ROOT-DIRECTORY (OF) structure:

This reconstructs <ROOT-DIRECTORY> on the specified structure and then rebuilds the bit table on that structure.

NOTE

Do not use this command to reconstruct <ROOT-DIRECTORY> on the public structure. (See Section 6.5.3.)

ERROR RECOVERY PROCEDURES

6.7.1 Reports from CHECK BITTABLE

When CHECKD finds errors during the CHECK BITTABLE function, it outputs error reports in the format:

```
error(including address n): page type
SUMMARY FOR FILE file
m   error type
- - - - -
```

You must pay particular attention to the error portion of the report, and take any action indicated in the explanation for that error. The page-type and error-type information is for your software contact, system manager, or owner of the file.

CHECKD first checks special system blocks, then swapping space, and lastly file pages. If an error occurs in checking the first two types of disk usage, the error report includes for each disk address in error only the first line of the error report format.

The possible errors output in a report are discussed first. In the list of those errors and their explanations below:

n = the number of a sector, a location on a disk pack relative to the beginning of a structure (also the number to use in the SCAN command to CHECKD)

page = four consecutive sectors or the minimum allocation unit for disk space.

ERRORS and ACTION TO TAKE

DISK ADDRESS n MARKED IN BAT BLOCKS

A page used by the file system is also marked in the BAT (bad allocation table) blocks. This means a hard disk error occurred on this page. Try to copy the file. Then, delete it (without any subcommands to DELETE). Warn your system manager or the owner of the file that data in a page may have been in error. Discuss salvaging the file from the copy, if it was successful, or from a DUMPER tape.

DISK ADDRESS n NOT IN BIT TABLE

A page used by the file system was not assigned in the bit table. CHECKD corrects the problem automatically.

ILLEGAL DISK ADDRESS n

CHECKD found a disk address too large for the size of the structure. Try to copy any file involved. Then type ENABLE and delete the file using the FORGET subcommand to DELETE. Warn your system manager or the owner of the file that the file involved may have contained errors. The file may be salvaged from the copy you tried to make, if the copy was successful, or from the most recent DUMPER tape.

MULTIPLY ASSIGNED DISK ADDRESS n

CHECKD found a page that was already assigned. This means two or more files are using the same disk address or a file is using a disk address previously assigned to a special file system block or to the swapping space. (Refer to the SCAN command to CHECKD to resolve these problems before resolving other problems.)

ERROR RECOVERY PROCEDURES

5. After CHECKD outputs the names of the files containing the multiply-assigned address/addresses, try to copy each of the files involved. Then, delete the files, using the FORGET subcommand to DELETE. For example,

```
$DELETE filespec1,filespec2,  
$$FORGET  
$$ RET  
$
```

6. Type ^ESET LOGINS ANY.
7. Run PTYCON.
8. Type GET SYSTEM:PTYCON.ATO.
9. Using MAIL or ^ESEND, notify the owners of the deleted files and discuss salvaging their files either from the copy, if it was successful, or from a DUMPER tape.

When CHECKD is run automatically at system load time because of disk problems or when you answer YES to the RUN CHECKD question, CHECKD performs the CHECK BITTABLE and CHECK DIRECTORY functions. You should answer YES to the RUN CHECKD question periodically, perhaps once a day, and always after a disastrous hardware failure. When the standard PTYCON.ATO file is used, one of the operator jobs runs the CHECK DIRECTORY function of CHECKD immediately after the system is reloaded.

----- Requirement -----

OPERATOR or WHEEL capability enabled and CTRL/C capability set.

----- Error Messages -----

? CHECKD: STRUCTURE NOT FOUND

CHECKD could not find the structure you specified.

? INVALID COMMAND CONFIRMATION

You pressed something other than RETURN at the end of the command.

? JSYS ERROR: message

Refer to Appendix A of the DECSYSTEM-20 Monitor Calls Reference Manual for the message.

? NOT A CHECKD COMMAND

The command that you typed to CHECKD is not a valid CHECKD command.

?WHEEL OR OPERATOR CAPABILITY REQUIRED

You must have WHEEL or OPERATOR capability enabled to run CHECKD. Use a job logged in under OPERATOR, which should have OPERATOR capability, and type ENABLE before you run CHECKD.

ERROR RECOVERY PROCEDURES

During the last part of the CHECK BITTABLE function, CHECKD compares a bit table it created with the system bit table for the appropriate structure. CHECKD then compares information in the two tables. If page counts disagree, or if the system bit table says a page is not used but CHECKD says it is used, CHECKD outputs:

```
?BIT TABLES INCONSISTENT AT CYLINDER n
```

Cylinder n is an area on a disk pack. This message indicates either an error in CHECKD or the monitor or that someone else is running CHECKD (and they shouldn't be).

If the system bit table says that a page is used, but CHECKD says it is not used, CHECKD counts the page as a lost page. It then outputs:

```
THERE ARE n LOST PAGES  
ADDRESSES ARE IN FILE file
```

where n is the number of lost pages found and file is the name of the file containing the addresses of those pages. The file name is of the form str:<dir>str-LOST-PAGES.BIN.n, where str and dir are your currently connected structure and directory. If the file is written at system load time, it is PS:<OPERATOR>PS-LOST-PAGES.BIN.n.

If CHECKD reported an illegal disk address or a multiply-assigned disk address, it does not write the lost page addresses in a file. It outputs:

```
%SUPPRESSED WRITING OF LOST PAGES FILE , TOO MANY ERRORS
```

If you get this message, correct the errors and run CHECKD with the CHECK BITTABLE function again to get a lost-pages file.

To regain disk space counted as lost pages, see the RELEASE command to CHECKD (Section 6.7).

If there are no lost pages, CHECKD outputs:

```
THERE ARE NO LOST PAGES
```

If CHECKD finds certain directory inconsistencies which cause it to try rebuilding a directory symbol table, it outputs:

```
% REBUILDING SYMBOL TABLE FOR structure:<directory>
```

If the rebuild is successful, CHECKD outputs [OK]. Otherwise, it outputs [FAILED]. It is normal for CHECKD to occasionally rebuild the symbol table for <ROOT-DIRECTORY> to account for the space used when a directory expands by a page.

If the rebuild fails, you should try to save with DUMPER all the files in the directory involved. Then follow the procedures in Sections 6.5.2.1 and 6.5.2.2. After that, discuss salvaging the files with their owner.

ERROR RECOVERY PROCEDURES

If any of the preceding errors occur, CHECKD also outputs a page type. This indicates the usage of the page containing the disk address in error. The page types are:

FILE PAGE n
LONG FILE PAGE TABLE
PAGE TABLE
SPECIAL SYSTEM BLOCKS
SWAPPING SPACE

If CHECKD has reported errors for a file, it then outputs:

SUMMARY FOR FILE file

where file is a complete file specification. CHECKD follows this with summary lines containing each type of error that has occurred for the file and m, how many times the error occurred. Note that one error can sometimes cause two summary lines. The error types in the summary are:

ASSIGNED PAGES MARKED IN BAT BLOCKS
DISK READ ERRORS
FAULTY ADDRESSES IN LONG FILE PAGE TABLE
FAULTY ADDRESSES IN PAGE TABLE
FAULTY LONG FILE PAGE TABLE ADDRESSES IN FDB
FAULTY PAGE TABLE ADDRESSES IN FDB
FILE ADDRESSES NOT IN BIT TABLE
ILLEGAL ADDRESSES
LONG FILE PAGE TABLES UNREADABLE
MULTIPLY ASSIGNED ADDRESSES
PAGE TABLES UNREADABLE

The last summary line for a file is followed by a dashed line. Then other error reports may follow.

Once CHECKD has finished checking all the files, it outputs a final summary of page counts as follows:

LOCAL COUNT OF FILE PAGES: i
LOCAL COUNT OF OVERHEAD PAGES: j
LOCAL COUNT OF USED PAGES: k

SYSTEM COUNT BEFORE CHECKD: l
SYSTEM COUNT AFTER CHECKD: m

In the above final summary:

i = number of pages used for data
j = number of pages used for overhead for the structure;
includes special system blocks, swapping pages, and overhead
pages for files
k = number of pages that CHECKD found to be used
l = number of pages that the system indicated as used before
CHECKD was run
m = number of pages that the system indicated as used after
CHECKD was run

If there are no errors, i plus j should equal k, and m minus k equals lost pages (discussed later in this section). If m is greater than l, CHECKD found one or more pages that were used but not assigned in the system bit table. CHECKD assigns them, and m reflects the count.

ERROR RECOVERY PROCEDURES

2. DISK ADDRESS 220754 MARKED IN BAT BLOCKS: FILE PAGE 50
SUMMARY FOR FILE PS:<FIELD-IMAGE>COBOL.EXE.4
1 ASSIGNED PAGES MARKED IN BAT BLOCKS
- - - - -

MULTIPLY ASSIGNED DISK ADDRESS 1403114: FILE PAGE 2762
SUMMARY FOR FILE PS:<RMSQA-TEST>FOOREL1..4
1 FAULTY ADDRESSES IN PAGE TABLE
1 MULTIPLY ASSIGNED ADDRESSES
- - - - -

MULTIPLY ASSIGNED DISK ADDRESS 261534: FILE PAGE 52
SUMMARY FOR FILE PS:<RMSQA-TEST>RMSSYM.UNV.14
1 FAULTY ADDRESSES IN PAGE TABLE
1 MULTIPLY ASSIGNED ADDRESSES
- - - - -

% REBUILDING SYMBOL TABLE FOR PS:<ROOT-DIRECTORY> [OK]
DISK ADDRESS 1350340 MARKED IN BAT BLOCKS: FILE PAGE 1
SUMMARY FOR FILE PS:<UNSUPPORTED>TV.EXE.7
1 ASSIGNED PAGES MARKED IN BAT BLOCKS
- - - - -

LOCAL COUNT OF FILE PAGES: 125793
LOCAL COUNT OF OVERHEAD PAGES: 15216
LOCAL COUNT OF USED PAGES: 141007

SYSTEM COUNT BEFORE CHECKD: 141149
SYSTEM COUNT AFTER CHECKD: 141149

THERE ARE 137 LOST PAGES
% SUPPRESSED WRITING OF LOST PAGES FILE , TOO MANY ERRORS

ERROR RECOVERY PROCEDURES

If you get any of the following messages from CHECKD, perform the same procedure as when a rebuild fails. In the messages, str:<dir> is the structure and directory name of the inconsistent directory.

ACTBAD: ILLEGAL FORMAT FOR ACCOUNT BLOCK IN DIRECTORY str:<dir>
DROCHK: ILLEGAL FORMAT FOR PAGE 0 IN DIRECTORY str:<dir>
EXTBAD: ILLEGAL FORMAT FOR EXTENSION BLOCK IN DIRECTORY str:<dir>
FDBBAD: ILLEGAL FORMAT FDB IN DIRECTORY str:<dir>
NAMBAD: ILLEGAL FORMAT FOR NAME BLOCK IN DIRECTORY str:<dir>
OPENF FAILED ON DIRECTORY str:<dir> - SKIPPED
RCDIR FAILED ON DIRECTORY str:<dir> - SKIPPED
UNSBAD: ILLEGAL FORMAT FOR ACCOUNT BLOCK IN DIRECTORY str:<dir>

----- Examples -----

```
1. RUN CHECKD? Y
   [CHECKING FILE CONSISTENCY]

   [WORKING ON STRUCTURE - PS:]

   DISK ADDRESS 4 MARKED IN BAT BLOCKS: SPECIAL SYSTEM BLOCKS
   - - - - -
   DISK ADDRESS 443264 MARKED IN BAT BLOCKS: SWAPPING SPACE
   DISK ADDRESS 444574 MARKED IN BAT BLOCKS: SWAPPING SPACE
   - - - - -
   DISK ADDRESS 220754 MARKED IN BAT BLOCKS: FILE PAGE 50
   SUMMARY FOR FILE PS:<FIELD-IMAGE>COBOL.EXE.4
   1   ASSIGNED PAGES MARKED IN BAT BLOCKS
   - - - - -
   % REBUILDING SYMBOL TABLE FOR PS:<ROOT-DIRECTORY> [OK]
   DISK ADDRESS 1350340 MARKED IN BAT BLOCKS: FILE PAGE 1
   SUMMARY FOR FILE PS:<TOTTON>XPL.PAT.1
   1   ASSIGNED PAGES MARKED IN BAT BLOCKS
   - - - - -

   LOCAL COUNT OF FILE PAGES: 129711
   LOCAL COUNT OF OVERHEAD PAGES: 15858
   LOCAL COUNT OF USED PAGES: 145569

   SYSTEM COUNT BEFORE CHECKD: 146671
   SYSTEM COUNT AFTER CHECKD: 146671

   THERE ARE 1086 LOST PAGES

   ADDRESSES ARE IN FILE PS:<OPERATOR>PS-LOST-PAGES.BIN.1
```

ERROR RECOVERY PROCEDURES

6.9 HUNG CONSOLE TERMINAL (LA36)

If you are trying to type at the CTY and no characters are printed, do the following:

1. Be sure the terminal is plugged in.
2. Be sure the CTY has paper. If it doesn't, replenish the paper supply. If you still get no characters printed, switch the terminal to local and then back to line.
3. Check the fuse on the vertical panel under the keyboard.
4. Try the terminal in LOCAL.
5. Be sure it's on LINE and set for the correct speed.
6. If there is a CAPS LOCK key, be sure it's pressed down.
7. See if CTRL/\ (control backslash) will get you into the console processor command language. If it does, type QUIT or CTRL/Z to return to TOPS-20.
8. Check if other terminals are working.

If you try all the above and still fail to get any echo from the CTY, try reloading the system via DISK or FLOPPY. If that fails, notify your field service representative.

ERROR RECOVERY PROCEDURES

6.8 RESTARTING PROGRAMS UNDER SYSJOB

When you receive a fatal error message on the CTY from a program running under SYSJOB, you must restart it by giving commands to SYSJOB via the ^ESPEAK command. The format of the message follows:

```
** SYSJOB: SUBJOB CRASHED, DATA FOLLOWS: **
  n process state AT m date time
  JSYS ERROR:message
  FORK ACS: a b c d
```

```
      n = number of the process
process = name of the process, e.g., INFO
state = CRASHED or HALTED
      m = PC value
a,b,c,d = content of accumulators 1 to 4
```

Also, if you type the SYSJOB STATUS command via ^ESPEAK (Appendix A), and there is no entry for a program normally run under SYSJOB, you must restart that program.

The following programs run as processes under SYSJOB.

1. INFO
2. MAILER
3. QUASAR

To restart a program under SYSJOB, type the following to PTYCON.

1. PUSH
2. ENABLE
3. ^ESPEAK
4. RUN SYS:program
5. CTRL/Z
6. POP

----- Example -----

```
PTYCON> PUSH
      TOPS-20 COMMAND PROCESSOR 3(400)
@ENABLE
$^ESPEAK (TO SYSJOB)
 [PLEASE TYPE SYSJOB COMMANDS - END WITH ^Z]
RUN SYS:INFO
^Z
$POP
PTYCON>
```

----- Hints -----

If you restart QUASAR, you must also restart LPTSPL, BATCON, and SPRINT (if they were previously running).

If you were trying to run MAIL and you received a message from SYSJOB indicating a problem with MAILER or INFO, restart MAILER or INFO. Then refer to the second hint in Section 5.1.2.

ERROR RECOVERY PROCEDURES

6.11 PS NOT FOUND

During a system reload, if you see the message:

```
PS NOT FOUND. WHAT IS THE NAME OF THE PUBLIC STRUCTURE?
```

the system was not able to find a structure named PS:. You must then type the name of the structure that is going to be the public structure. As long as the TOPS-20 monitor continues to run, that structure will be known as PS:. It will not be recognized by its original name that you typed in answer to the question. Note that the public structure must have swapping space, usually a front-end file system, an appropriately installed <SYSTEM> and <SUBSYS>, and directories to allow users to log in.

----- Example -----

To designate the structure 2136: as the public structure when PS: was not found:

```
PS NOT FOUND. WHAT IS THE NAME OF THE PUBLIC STRUCTURE? 2136
```

```
[2136 MOUNTED AS PS]
```

ERROR RECOVERY PROCEDURES

6.10 TOPS-20 MONITOR NOT FOUND

If you are loading the system using the KL bootstrap which reads TOPS-20 from disk, and after the message KLI -- BOOTSTRAP LOADED AND STARTED you get:

```
?FIL NOT FND
```

the bootstrap was not able to find on disk the TOPS-20 monitor that you specified. Unless you specified a name after a BOOT> prompt, the file not found was PS:<SYSTEM>MONITR.EXE.

Consider the following:

1. If you specified a nondefault monitor name, be sure you typed the correct directory name and filename.
2. Be sure you have loaded a bootstrap that will load a monitor from disk.
3. Be sure the appropriate disk packs are mounted and that the drives are on-line.
4. If you wanted the default monitor, you must try to load it from magnetic tape (Section 3.3.2) using your most recent system backup tape (Section 5.1.6.1). Either the file PS:<SYSTEM>MONITR.EXE has been destroyed on the disk or some other problem has affected the file system, possibly a hardware error.
5. If the system comes up for timesharing after you load the monitor from magnetic tape, chances are that only the monitor file was bad on disk. Another good copy of the monitor should be restored from a DUMPER tape to PS:<SYSTEM>.
6. If the system does not come up for timesharing, it is likely that there are problems with the file system. First consult your software contact. He may want to investigate the situation before recommending reconstructing the ROOT-DIRECTORY or the lengthy procedure of re-creating the file system.



ERROR RECOVERY PROCEDURES

6.12 BOOTSTRAP LOAD FAILED

If the bootstrap failed to load during a system reload, you should zero memory and then try to reload again. This is sometimes necessary after a power failure.

To zero or clear memory, type the following at the CTY.

1. CTRL/\
2. ABORT
3. SET CONSOLE PROG
4. ZERO 0>address

where address is the maximum memory address on your system.

----- Example -----

```
PAR>ABORT
PAR%SET CONSOLE PROG
  CONSOLE MODE: PROGRAMMER
PAR%ZERO 0>777777
PAR%
```

DEVICE OPERATION AND MAINTENANCE

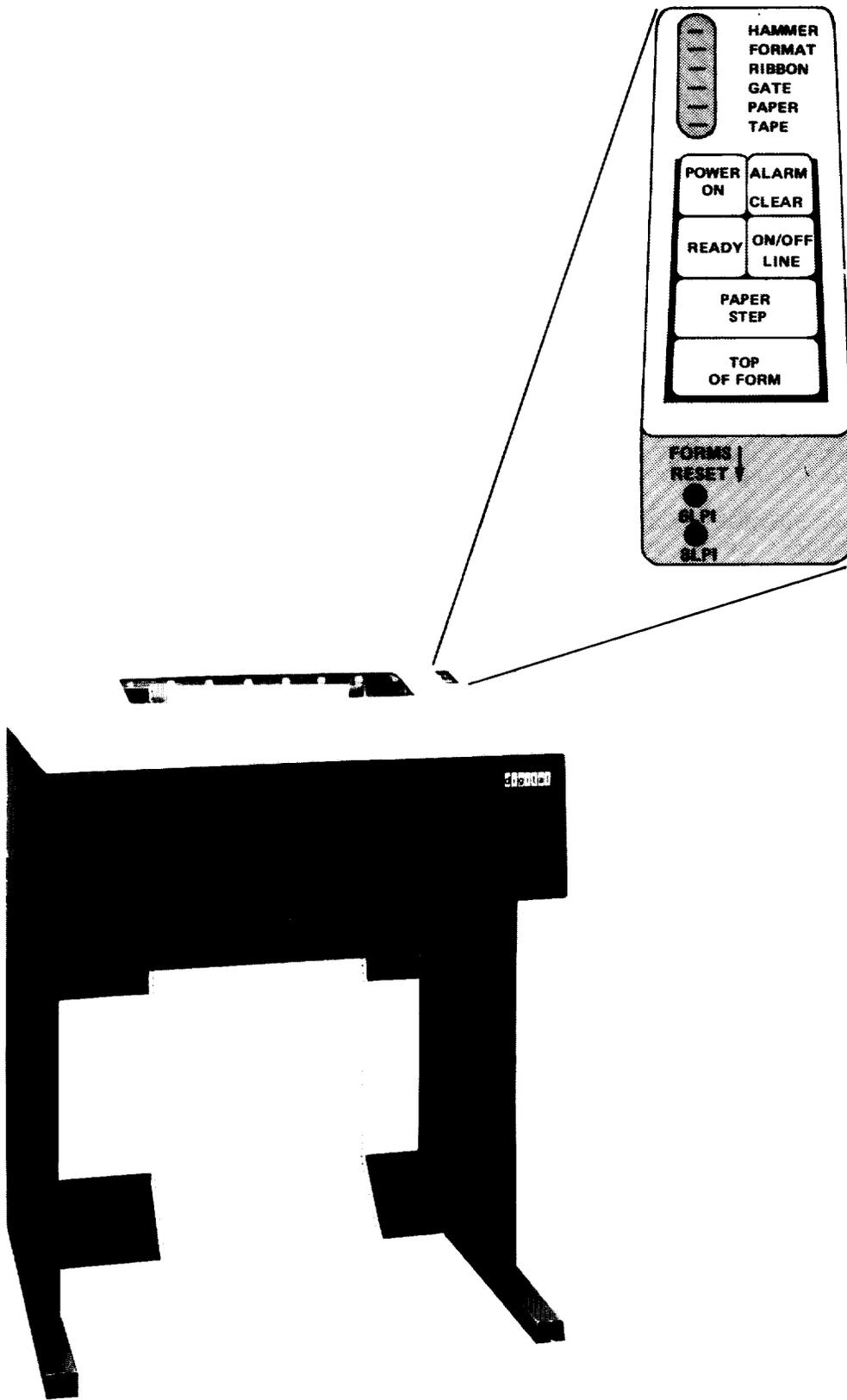


Figure 7-1 LP05 Line Printer

CHAPTER 7

DEVICE OPERATION AND MAINTENANCE

It is important to know how to operate the peripheral equipment on your system and how to keep it in the best possible condition. This chapter discusses these procedures.

Because most equipment operates more efficiently when kept clean, each section has a specific cleaning procedure for each device.

There are, however, some general rules for cleaning. First of all, the computer room should be kept as neat and clean as possible. Secondly, you should have the following cleaning supplies available.

1. 91% isopropyl alcohol
2. Lint-free wipers
3. Spray cleaner
4. Vacuum cleaner with rubber or plastic attachments, which can blow air as well as take in air
5. Cotton-tipped applicators

You should clean the exterior of all equipment weekly. Vacuum all outside surfaces including cabinet tops. Use spray cleaner on all exposed surfaces except around switches.

In general, do not clean the interior of any equipment unless so directed in the following sections; your field service representative does that job. Specific instructions for cleaning line printers and magnetic tape drives are given in Sections 7.1.6 and 7.2.2.

Always be careful not to bump or change the position of any switches, because this could cause a crash. Likewise, when you are cleaning the exterior of any disk drives, be careful not to jar the equipment; that could cause a serious hardware head crash.

Lastly, if you ever have any problem or doubts concerning the operation or cleaning procedure for a device, consult your field service representative.

7.1 LINE PRINTER

Some of the procedures below refer to an LP05 line printer (Figure 7-1) or an LP14 line printer (Figure 7-2), and some refer to an LP10 line printer (Figure 7-3). Be sure to follow the procedures for the appropriate printer.

DEVICE OPERATION AND MAINTENANCE

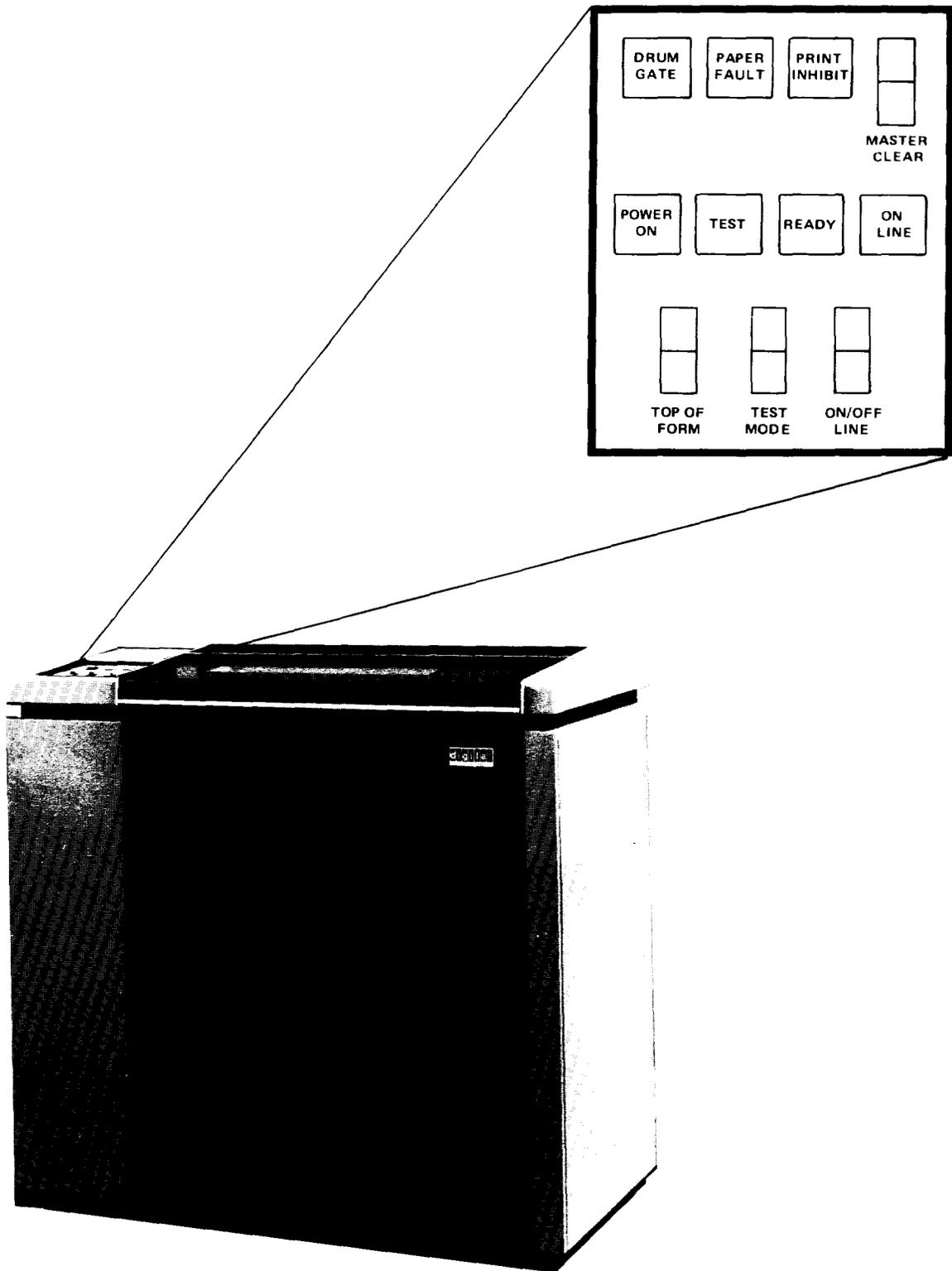


Figure 7-3 LP10 Line Printer

DEVICE OPERATION AND MAINTENANCE

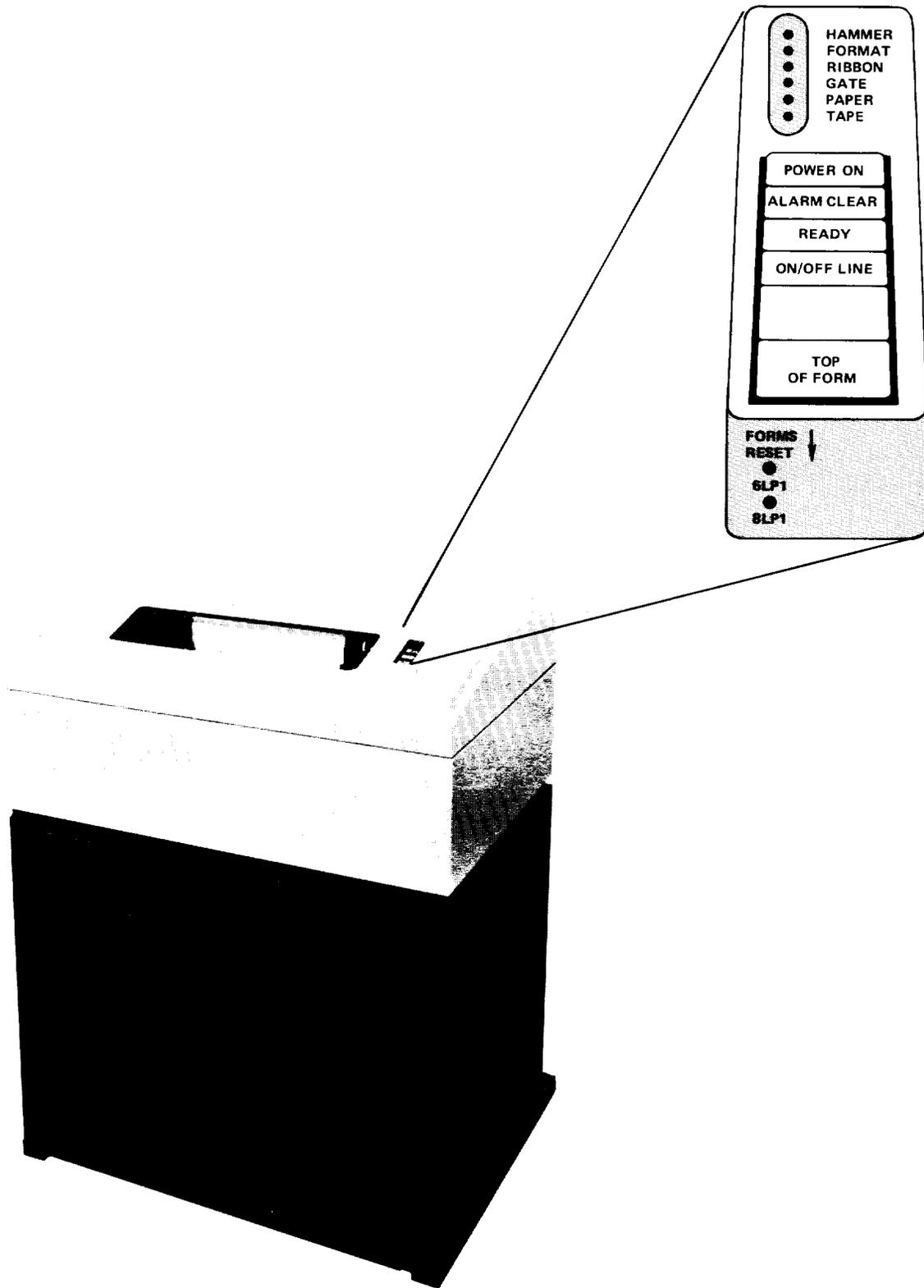


Figure 7-2 LPl4 Line Printer

DEVICE OPERATION AND MAINTENANCE

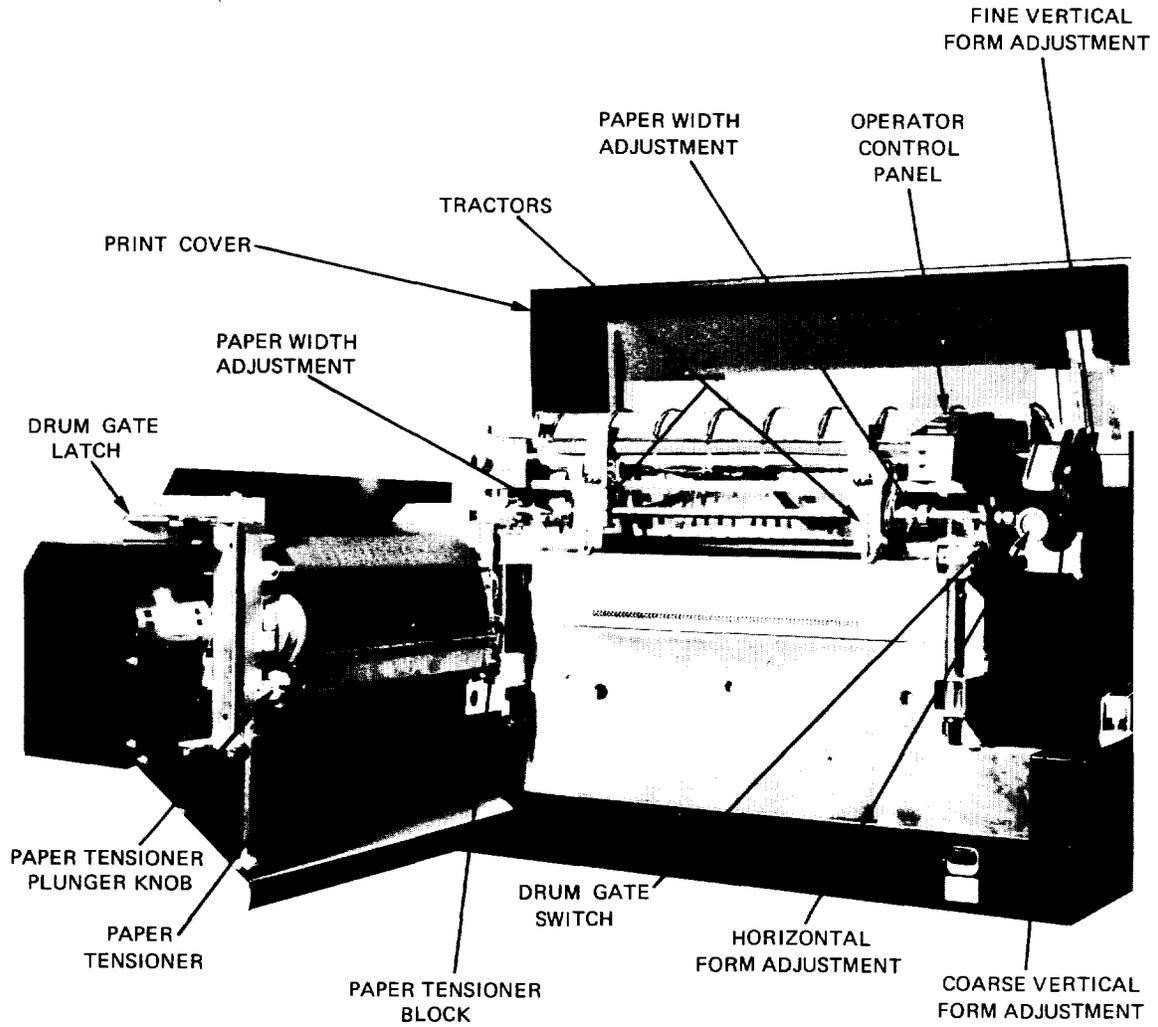


Figure 7-4 LP05 or LP14 Paper Installation

DEVICE OPERATION AND MAINTENANCE

Pay special attention to the printer's on-line/off-line condition. A printer is off-line only when the on-line indicator is not lit. If the on-line indicator stays lit after you try to set the printer off-line, unprinted data still remains in the print buffer. You must then do one of the following:

1. Press the ON/OFF LINE switch again to cancel the off-line request and continue printing.
2. Open the drum gate, or set MASTER CLEAR and LOSE DATA.
3. Wait for the rest of the line to be printed, and let the printer go off-line. The on-line light will then go out.

7.1.1 Distributing Listings

The line printer spooler, LPTSPL, puts banner pages on listings to identify the owner of a listing. Your system manager and operations staff should decide where line printer listings are to be placed and when they will be placed there. The listings can be distributed to users or placed in an area so users can get them.

7.1.2 Changing Paper and Forms

LP05 or LP14 Procedure

The following procedure describes paper or forms installation, alignment, and adjustment on an LP05 or LP14 line printer (Figures 7-1, 7-2, 7-4, and 7-5).

1. Press the ON/OFF LINE switch to set the printer off-line (indicator not lit).
2. Lift the printer cover.
3. Using the drum gate latch, unlatch and fully open the drum gate.
4. Press and release the TOP OF FORM switch. The tractors will advance to the top-of-form position.
5. Open the spring-loaded pressure plates on the tractors.
6. Place paper in the tractors and close the pressure plates.
7. Loosen both paper-width adjustment guides and move both tractors laterally to adjust for correct paper-width. Tighten the paper-width adjustment guides.
8. If necessary, align the perforations in the paper above the print line index (Figure 7-5) by depressing the FORMS RESET switch and rotating the tractor shaft by using the COARSE VERTICAL FORM ADJUSTMENT control. Then release the FORMS RESET switch.
9. Adjust the horizontal position of the paper with the HORIZONTAL FORM ADJUSTMENT control. Use the horizontal indentation index marks as a guide.
10. Close and latch the drum gate.

DEVICE OPERATION AND MAINTENANCE

11. Press ALARM/CLEAR.
12. Press and release the ON/OFF LINE switch to set the printer on-line (indicator lit).
13. Use the FINE VERTICAL FORM ADJUSTMENT control to correct any small misalignment in the printout during operation.
14. Close the printer cover.

LPl0 Procedure

The following procedure describes paper or forms installation, alignment, and adjustment on an LPl0 line printer (Figures 7-3, 7-6 and 7-8).

1. Press the ON/OFF LINE switch to set the printer off-line (ON LINE indicator not lit).
2. Lift the printer window.
3. Using the drum gate latch, unlatch and fully open the drum gate.

CAUTION

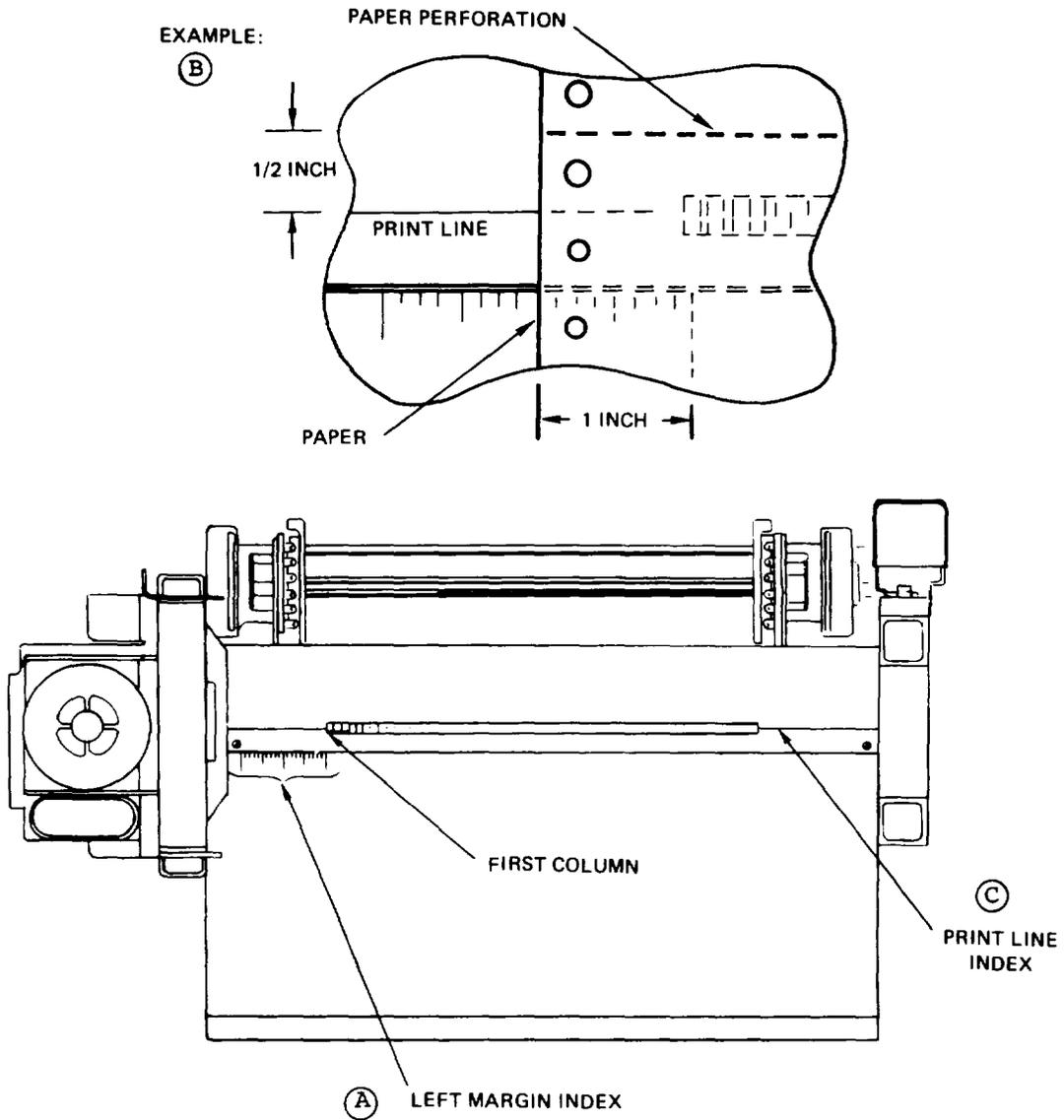
Wait for the character drum to stop rotating before you proceed.

4. Be sure the proper vertical format tape is in the printer (Section 7.1.4).
5. Press and release the TOP-OF-FORM switch.
6. Set the COPIES CONTROL LEVER to match the form being used.
7. Be sure the upper and lower left tractors are vertically aligned.
8. Rotate FINE ADJUSTMENT thumbwheels fully clockwise on both upper and lower right tractors.
9. Unlock the upper and lower tractor locks on right tractors, and move them to the extreme right.
10. Open all tractor pressure plates.
11. Place left edge of form in upper left tractor and close the pressure plate.
12. Position upper right tractor to allow precise alignment of tractor feed pins to form-feed holes of the paper. Lock upper right tractor and close tractor pressure plate.

NOTE

Do not pull the paper taut.

DEVICE OPERATION AND MAINTENANCE



- (A) The paper may be horizontally positioned to provide left margins up to two inches wide.
- (B) The example shows paper properly installed for a 1/2-inch top margin (top-of-form spacing) and a one-inch left margin.
- (C) The print line index shows the location of the center of the print line hammer bank.

Figure 7-5 LP05 or LP14 Forms Alignment

DEVICE OPERATION AND MAINTENANCE

13. Loosen PAPER TENSION locking knob and PAPER TENSION control knob.
14. Place paper in lower left tractor and close pressure plate.
15. Position lower right tractor to allow precise alignment of tractor feed pins to form-feed holes of the paper. Lock lower right tractor and close tractor pressure plate.

NOTE

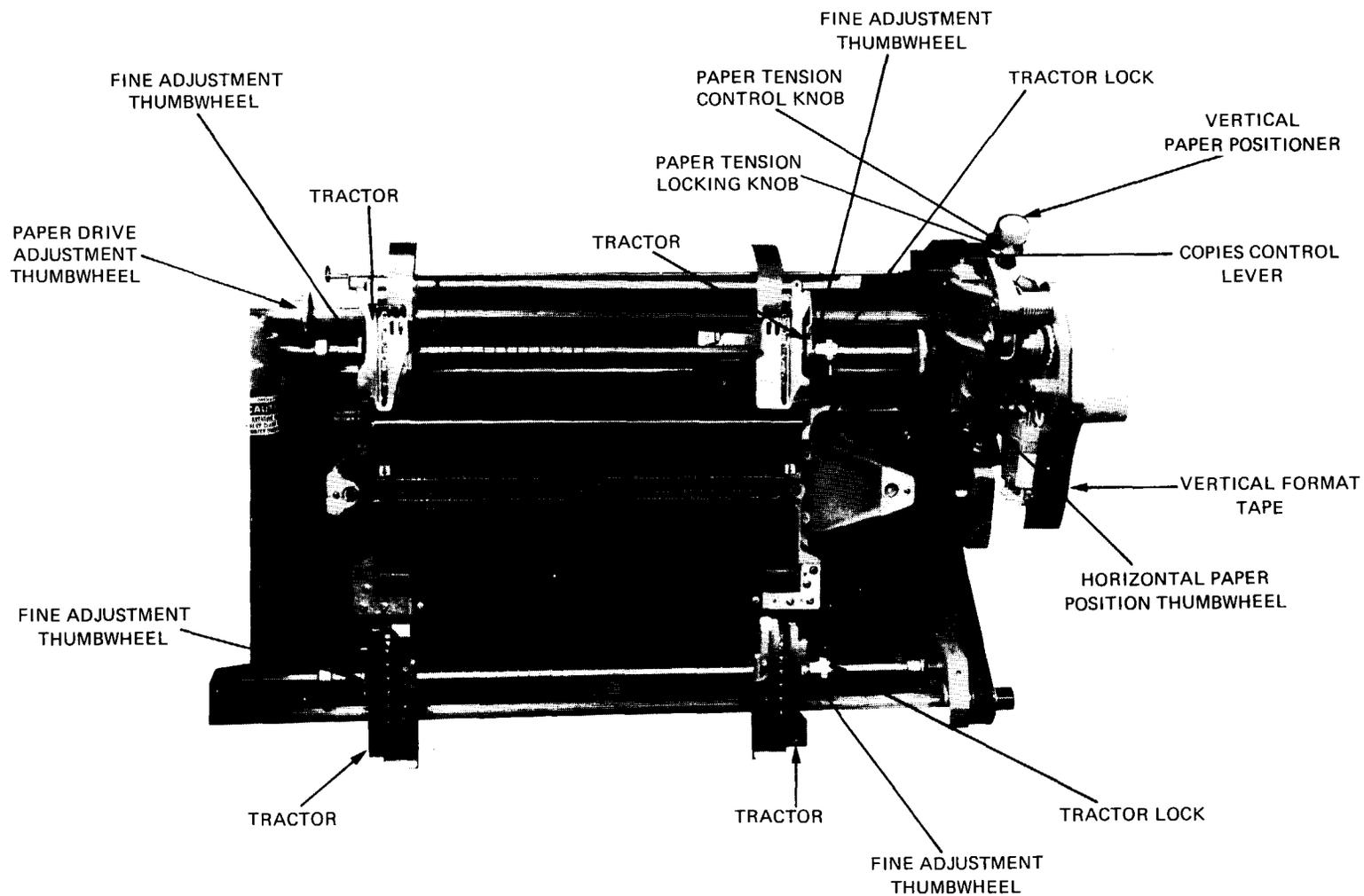
Do not pull the paper taut.

16. Turn PAPER TENSION control knob clockwise until proper paper tension exists, i.e., when a slight deformation of the top edge of the form-feed holes in the paper is noticed. Tighten the PAPER TENSION locking knob.
17. Rotate FINE ADJUSTMENT thumbwheel on both the upper and lower right tractors until proper horizontal paper tension exists. The tension is correct when there is a slight deformation of the right edge of the form-feed holes in the paper.
18. Move the RUN/ADJUST lever (located right of the vertical format unit) to the ADJUST position, and rotate the paper drive mechanism by use of the PAPER DRIVE adjustment thumbwheel until top-of-form is aligned in position.

NOTE

If you are changing the type of forms or the carriage control tape, proceed with step 19. Otherwise, go to step 24.

19. Be sure that the carriage control tape is at the TOP-OF-FORM INDEX by pressing and releasing the TOP-OF-FORM switch with the tape loop installed.
20. Mount the FORMS ALIGNMENT SCALE (located in the paper storage area, right side) across the hammer bank area using the dowel pins located on special castings at both sides of the hammer bank.
21. Using the HORIZONTAL PAPER POSITION thumbwheel, move the form horizontally until the first print column on the form corresponds to the first column on the FORMS ALIGNMENT SCALE.
22. Move the RUN/ADJUST lever to the ADJUST position. Using the PAPER DRIVE ADJUSTMENT thumbwheel, adjust the form vertically until the top of the form is aligned with the FORMS ALIGNMENT SCALE print line.
23. Remove the FORMS ALIGNMENT SCALE and place it in the scabbard (paper storage area, right side).
24. Move the RUN/ADJUST lever to the RUN position.
25. Close and latch the drum gate.



7-9

Figure 7-6 LP10 Paper Installation

DEVICE OPERATION AND MAINTENANCE

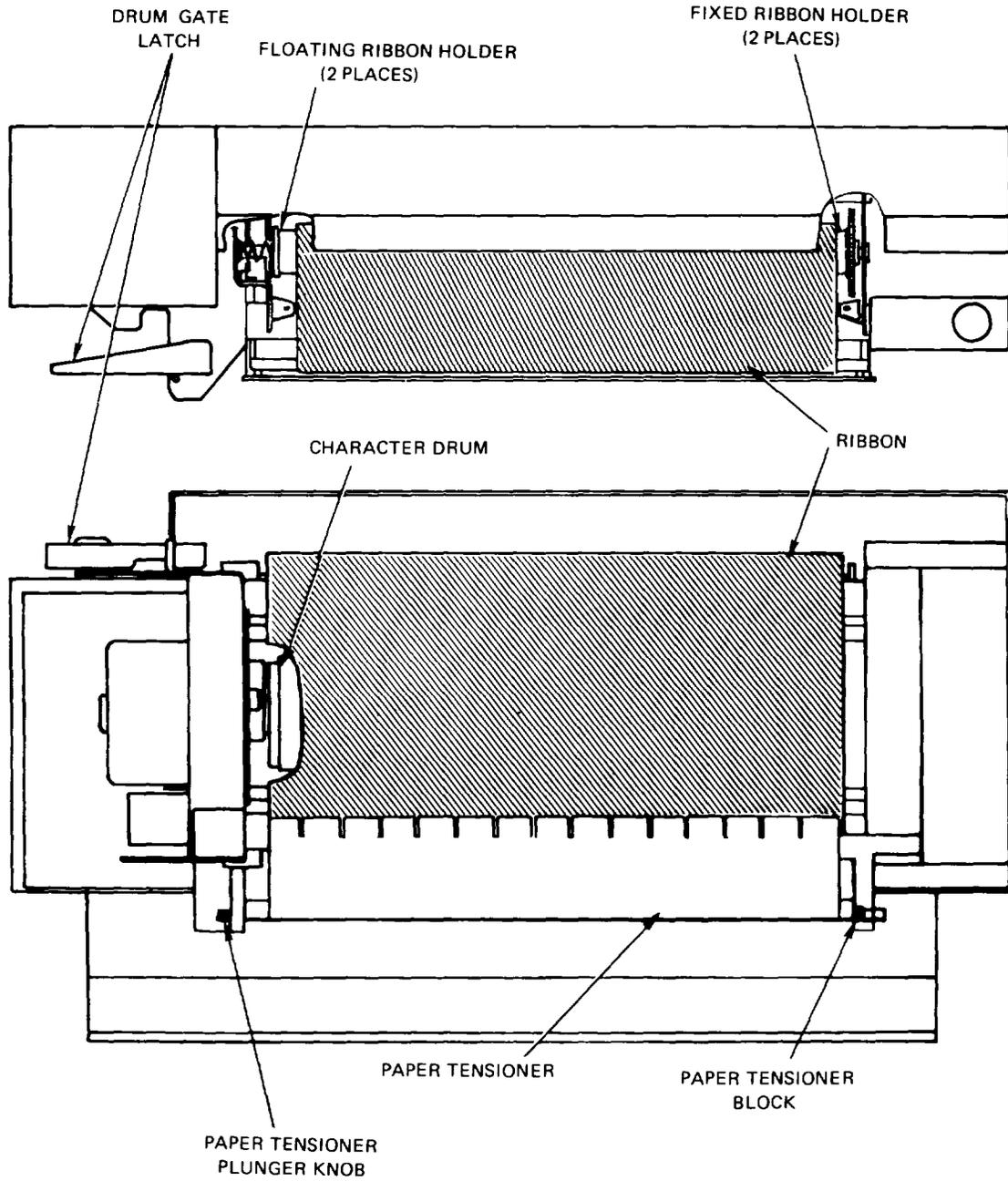


Figure 7-7 LP05 or LP14 Ribbon Installation

DEVICE OPERATION AND MAINTENANCE

26. Close the printer window.
27. To check the paper tension, press the TOP-OF-FORM switch several times and check that the paper does not pull loose from the paper-feed tractors.
28. Press the ON/OFF LINE switch to set the printer on-line (ON LINE indicator lit).

7.1.3 Changing and Reversing the Ribbon

If the print quality isn't as good as it should be, you may need to change or reverse the ribbon.

LP05 or LP14 Procedure

The following procedure describes how to change the ribbon on an LP05 or LP14 line printer (Figures 7-1, 7-2, 7-4, and 7-7).

1. Use the plastic gloves supplied with the ribbon.
2. Press the ON/OFF LINE switch to place the printer off-line (indicator not lit).
3. Lift the printer cover.
4. Using the drum gate latch, unlatch and fully open the drum gate.

NOTE

The character drum must be stationary before you proceed to the next step.

5. While holding the paper tensioner with one hand, pull the paper tensioner plunger knob to your left and remove the paper tensioner from the drum gate.
6. Grasp the right end (fixed ribbon holders) of the top and bottom ribbon cores and push left against the floating holder springs; pull the right end of the ribbon cores away from the drum gate first.
7. Remove the new ribbon from its packing box and remove the plastic wrapping.
8. Place the fully wound ribbon core over the top floating ribbon holder. The ribbon must be installed so that it unwinds from the top of the ribbon core.
9. Push the ribbon core end toward your left against the floating ribbon-holder spring, and place the opposite ribbon core end over the top fixed ribbon holder. Be sure that the holder guide-pin slips into the core end slot.
10. Unwind the second ribbon core and bring it down over the character drum and ribbon guide bars.

DEVICE OPERATION AND MAINTENANCE

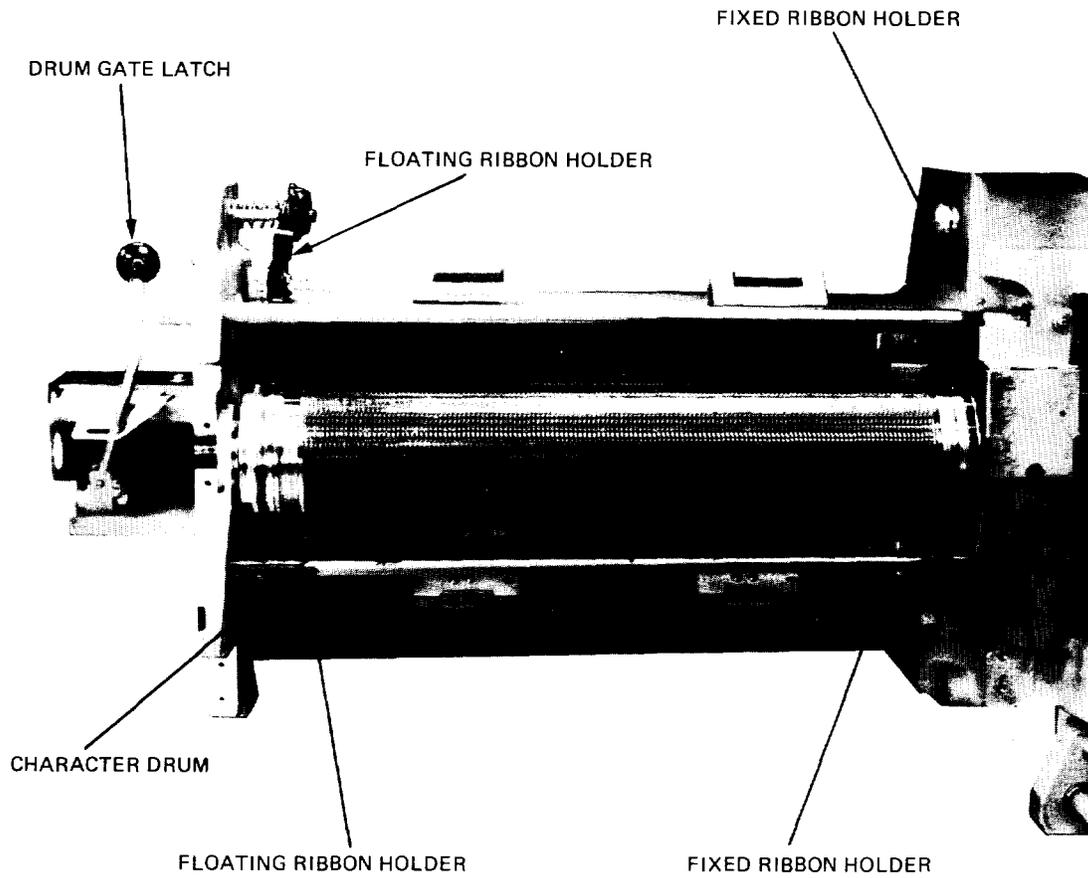


Figure 7-8 LP10 Ribbon Installation

DEVICE OPERATION AND MAINTENANCE

11. Place the ribbon core on the bottom ribbon holders as in step 9 for the top ribbon core.
12. Install the paper tensioner by placing the paper tensioner block in position and pushing the tensioner against the tensioner knob, while pulling the knob to allow engagement.
13. Close the drum gate and press ALARM/CLEAR.
14. Press the ON/OFF LINE switch to place the printer on-line (indicator lit).

Most listings have more print on the left half of the paper. Therefore, to prevent the ribbon from wearing unevenly, you should reverse the ribbon. Do the following:

1. Follow steps 1 through 6 above to remove the ribbon.
2. Holding the two ribbon cores as you took them off the printer, rotate them clockwise until the top core is at the bottom.
3. Now that you have reversed the top and bottom ribbon cores, put the ribbon back on the printer by following steps 9 through 14 above.

LP10 Procedure

The following procedure describes how to change the ribbon on an LP10 line printer (Figures 7-3 and 7-8).

1. Use the plastic gloves supplied with the ribbon.
2. Press the ON/OFF LINE switch to set the printer off-line (ON LINE indicator not lit).
3. Lift the printer window.
4. Move the drum gate latch left and pull forward to fully open the drum gate.

CAUTION

Wait for character drum to stop rotating before you proceed.

5. Grasp the ribbon cores and force them left toward the drum gate latch until the floating ribbon-holder springs are completely compressed.
6. Remove ribbon by pulling right end of ribbon cores away from drum gate.
7. Hold new ribbon cores together and remove ribbon from box.
8. Place fully wound ribbon core over bottom floating ribbon holder.
9. Push core left and place right core end over bottom fixed ribbon holder. Be sure that the holder guide-pin slips into the slot on the core end.

DEVICE OPERATION AND MAINTENANCE

Table 7-1
Standard LP10 Line Printer Carriage Tape

Form 1 Line	Form 2 Line	Channels Punched
00	66	1-2-3-4-5-6-7-8-9-10-11-12
01	67	5-8
02	68	3-5-8
03	69	4-5-8
04	70	3-5-8
05	71	5-8-9
06	72	3-4-5-8
07	73	5-8
08	74	3-5-8
09	75	4-5-8
10	76	3-5-6-8-9
11	77	5-8
12	78	3-4-5-8
13	79	5-8
14	80	3-5-8
15	81	4-5-8-9-10
16	82	3-5-8
17	83	5-8
18	84	3-4-5-8
19	85	5-8
20	86	3-5-6-7-8-9
21	87	4-5-8
22	88	3-5-8
23	89	5-8
24	90	3-4-5-8
25	91	5-8-9-11
26	92	3-5-8
27	93	4-5-8
28	94	3-5-8
29	95	5-8
30	96	2-3-4-5-6-8-9-10
31	97	5-8
32	98	3-5-8
33	99	4-5-8
34	100	3-5-8
35	101	5-8-9
36	102	3-4-5-8
37	103	5-8
38	104	3-5-8
39	105	4-5-8
40	106	3-5-6-7-8-9-12
41	107	5-8

DEVICE OPERATION AND MAINTENANCE

10. Unwind fully wound ribbon core enough to bring ribbon up and over character drum.
11. Slip ribbon between ribbon guide clips and box sensor.
12. Place ribbon core on top floating ribbon holder.
13. Push core left and place right core end over top fixed ribbon holder. Be sure that the holder guide-pin slips into the slot on the core end.
14. Close and latch drum gate.
15. Close the printer window.
16. Press the ON/OFF LINE switch to set the printer on-line (ON LINE indicator lit).

Most listings have more print on the left half of the paper. Therefore, to prevent the ribbon from wearing unevenly, you should reverse the ribbon. Do the following:

1. Follow steps 1-6 above to remove the ribbon.
2. Holding the two ribbon cores as you took them off the printer, rotate them clockwise until the top core is at the bottom. Now the top and bottom cores are reversed.
3. Put the ribbon back on the printer by following steps 9 through 16 above.

7.1.4 Controlling the Vertical Format Unit

LP05 or LP14 Procedure

The LP05 and LP14 line printers have a direct access, vertical format unit which is controlled by software. (Refer to the files MAKVFU.DOC and MAKVFU.HLP.)

LP10 Procedure

To make a standard carriage control tape for vertical format control of 11-inch paper with 6 lines of printing per inch, do the following:

1. Obtain a manual punch made to punch a 12-channel carriage control tape for 6 lines of printing per inch.
2. Obtain a carriage control tape with feed holes, channels numbered 1 through 12, and lines numbered 0 to at least 135. In this case, the tape loop accommodates two forms.
3. Align the tape in the punch to begin punching in line 0.
4. Using Table 7-1 as a guide, proceed line by line on the tape, and punch a hole for each of the channels indicated.
5. After you have punched all the lines through 131, cut the tape at line 135. Spread some rubber cement between lines 129 and 135. Place line 0 over line 132. Keeping the feed holes aligned, press the ends of the tape together.

DEVICE OPERATION AND MAINTENANCE

The standard LP10 carriage tape causes the vertical actions listed in Table 7-2. Channels 1 through 8 are used by system software, and channels 9 through 12 are used by diagnostic programs.

Table 7-2
Standard LP10 Line Printer Vertical Action

Channel	Vertical Action
1	Top of form
2	Space half a page (30 lines)
3	Double space with automatic top of form after 30 impressions
4	Triple space with automatic top of form after 20 impressions
5	Single space (only channel using the last 6 lines of the page)
6	Space one sixth of a page (10 lines)
7	Space one third of a page (20 lines)
8	Single space with automatic top of form after 60 impressions
9	Space one twelfth of a page (5 lines)
10	Space one fourth of a page (15 lines)
11	Space 25 lines
12	Space 40 lines

A programmer requiring a nonstandard carriage control tape must tell you what channels need to be punched on each line. Be sure that you punch a tape to accommodate whatever number of forms are needed to make the tape loop at least 10 inches in circumference.

7.1.5 Controlling the Character Translation RAM

There are two files on the system to control the character translation RAM (random-access memory). The file SYS:LP64.RAM is used for 64-character set printers; the file SYS:LP96.RAM is used for 96-character set printers. This RAM controls the way characters are treated by the line printer controller (LP20). After TOPS-20 is started, this RAM is loaded according to a PRINTER command in <SYSTEM>n-CONFIG.CMD, where n is the TOPS-20 release number. (See the DECSYSTEM-20 Software Installation Guide for more information on n-CONFIG.CMD.)

If a RAM file gets destroyed, you can re-create it with MAKRAM. The instructions for running MAKRAM are in the files MAKRAM.HLP and MAKRAM.DOC.

DEVICE OPERATION AND MAINTENANCE

Table 7-1 (Cont.)
Standard LP10 Line Printer Carriage Tape

Form 1 Line	Form 2 Line	Channels Punched
42	108	3-4-5-8
43	109	5-8
44	110	3-5-8
45	111	4-5-8-9-10
46	112	3-5-8
47	113	5-8
48	114	3-4-5-8
49	115	5-8
50	116	3-5-6-8-9-11
51	117	4-5-8
52	118	3-5-8
53	119	5-8
54	120	3-4-5-8
55	121	5-8-9
56	122	3-5-8
57	123	4-5-8
58	124	3-5-8
59	125	5-8
60	126	5
61	127	5
62	128	5
63	129	5
64	130	5
65	131	5

6. Repunch the holes covered by the overlapped tape.
7. Set the printer off-line and open the printer cover.
8. Lift the tape loop reader handle, so that the sprocket shoe clears the sprocket teeth.
9. Place the tape over the tape loop reader capstan, so that the feed holes are over the sprocket teeth. Be sure that channel 12 of the tape is toward your left as you are facing the front of the line printer.
10. Close the tape loop reader. Be sure the tape stays attached to the drive sprocket while you clamp the drive sprocket shoe in place.
11. Press TOP-OF-FORM. The tape should halt with the channel 1 star wheel just beyond the TOP-OF-FORM hole.
12. Align forms vertically (Section 7.1.2 for LP10).
13. Close the printer cover.

DEVICE OPERATION AND MAINTENANCE

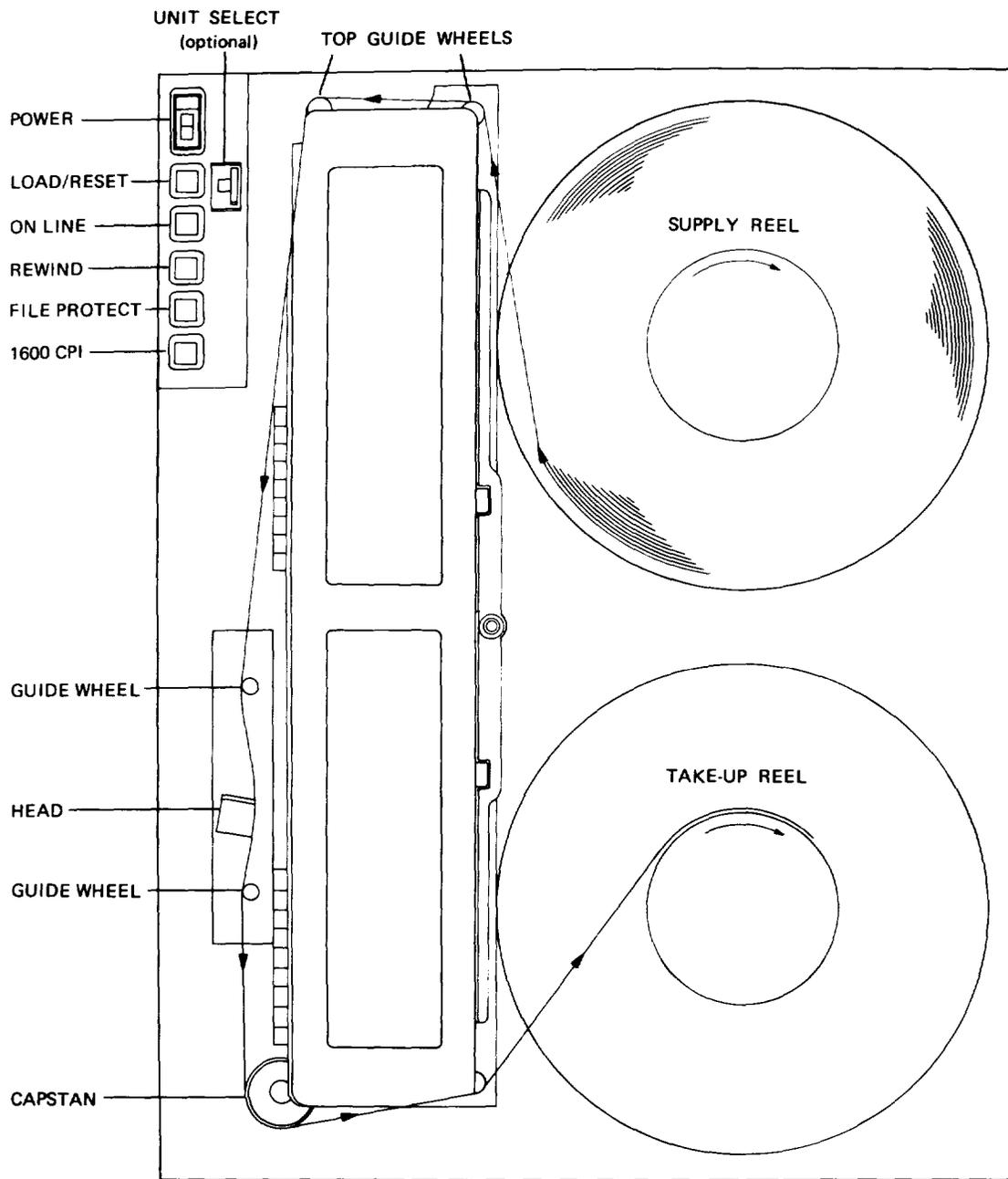


Figure 7-9 Loading Magnetic Tape

7.1.6 Cleaning the Line Printer

In addition to the general cleaning procedures given at the beginning of the chapter, you should clean the character drum every 100 hours, or sooner if necessary, using a soft suede brush and a vacuum cleaner. Every 500 hours, or sooner if necessary, clean the character drum with isopropyl alcohol.

7.2 MAGNETIC TAPES

The magnetic tapes are designated as logical units MTA0:, MTAl:, etc. The <SYSTEM>n-CONFIG.COMD file (see the DECSYSTEM-20 Software Installation Guide) defines these by matching a logical tape unit to the serial number of a drive.

NOTE

You must power on the drives before you load the system. Otherwise, the software will not recognize them as being available for use. Also, do not change the UNIT SELECT switch on a drive while the system is running. If you do, the correspondence between a physical drive and a logical unit may not be correct.

7.2.1 Mounting and Dismounting Magnetic Tapes

Mounting

The supply reel (reel to be read or written) is located at the top of the transport. The tape must unwind from the supply reel when the reel is turned clockwise. Note that a write enable ring is required on the supply reel to allow writing.

To load a tape reel (Figure 7-9), position the reel on the quick-release hub and depress the hub actuator. Thread the tape by taking the tape from the supply reel and guiding it:

1. Toward the arrow to the upper left of the supply reel
2. Over the two top guide wheels from right to left
3. Down and to the left of the upper white guide wheel
4. Slightly right and down, to go under the head
5. Down and to the left of the lower white guide wheel
6. Down under the capstan
7. Up and right, toward the arrow to the left of the take-up reel

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NOTE

Don't use rough or abrasive cloths to clean the head.

2. Clean the fixed guides, tape cleaner, capstan, and vacuum chamber (Figure 7-9) with a cotton swab moistened with isopropyl alcohol to remove accumulated oxide and dirt. The vacuum column door may be opened to gain access to the chamber surfaces.
3. Clean the rotating tape guides with a lint-free cloth or cotton swab moistened in isopropyl alcohol. Wipe the surfaces carefully to remove all accumulated oxide and dirt.

NOTE

Don't soak the guides with excessive solvent; it can seep into the guide bearings, causing contamination or a breakdown of the bearing lubricant.

7.3 CARD READER

The card reader is referred to as CDR0.

The operator control panels for the low-speed reader (Model M200) and high-speed reader (Model 1200) are shown in Figure 7-10.

7.3.1 Loading and Unloading Cards

Use the following procedures to load the input hopper with punched cards to be read.

1. Be sure the reader is powered ON (POWER indicator lit), and check that the MODE switch on the rear control panel of the reader is set to REMOTE.
2. Pull the hopper follower back with one hand and begin loading card decks into the hopper. Be sure to place the first card to be read at the front with the 9 edge down, column 1 to the left.
3. Continue placing cards into the input hopper until it is loosely filled.

CAUTION

Do not pack the input hopper so full that the air from the blower cannot riffle the cards properly. If the cards are packed too tightly, the vacuum picker will not work properly.

DEVICE OPERATION AND MAINTENANCE

Wrap the tape leader onto the take-up reel so that the tape will wind onto the reel when it is rotated clockwise. Wind at least three turns onto the take-up reel. Remove all slack in the tape path.

After the tape has been loaded and checked for correct seating in the guides, bring the tape to load point by pressing and releasing the LOAD switch.

Recheck tape tracking in the guides and close the dust cover door.

NOTE

The transport door should remain closed during normal operation to achieve maximum data reliability.

When the load cycle is complete, the tape will stop at the load point. Then, if the ON LINE indicator is not lit, press ON LINE. The transport is now ready to receive additional commands. If the supply reel does not have a write enable ring, the file protect indicator will be lit.

Dismounting

To unload a tape, do the following:

1. Press the ON LINE switch to turn off the indicator light.
2. Press and release the REWIND switch; the tape will rewind to BOT (the beginning of tape marker).
3. Press and release the REWIND switch again; this starts an unload sequence.

NOTE

It is not necessary to wait for the tape to rewind to BOT if an unload is desired; the REWIND switch may be depressed twice in succession.

4. Open the transport door and remove the reel. Close the transport door. Place the reel in the proper place.

7.2.2 Cleaning Magnetic Tape Drives

Clean equipment is essential for proper operation. Minute particles of dirt trapped between the head and the tape can cause data errors.

Each day you should do the following:

1. Clean the head. Using a lint-free cloth or cotton swab moistened in isopropyl alcohol, wipe the head carefully to remove all accumulated oxide and dirt.

DEVICE OPERATION AND MAINTENANCE

7.4 DISK PACKS

The different types of disk drives along with their operator control panels are shown in Figures 7-11 and 7-12.

7.4.1 Mounting and Dismounting Disk Packs

The following steps describe how to mount and dismount disk packs. Extreme care must be taken to avoid physical damage to the pack and drive. Do not put anything on top of a drive except empty disk pack covers.

Mounting

1. Slide back the drive cover.
2. Remove the bottom plate from the disk pack container by means of the locking handle located on the underside of the bottom plate.
3. Being sure that you have the pack with the correct visual information on it, slide the pack straight down onto the disk drive hub.
4. Turn the pack cover clockwise until the pack is locked into position. DO NOT FORCE THE COVER ONCE IT STOPS TURNING.
5. Pull the pack cover straight up and off the pack.
6. Close the drive cover and put the empty disk pack cover on top of the drive.
7. Push the START/STOP switch to the START position.
8. When the READY light is on, the drive is ready.

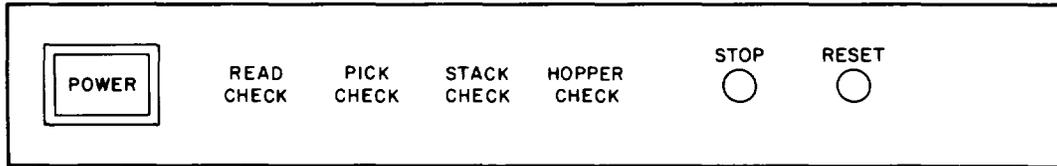
Dismounting

1. Push the START/STOP switch to the STOP position and wait until the pack comes to a complete stop.
2. Slide back the drive cover.
3. Slip the pack cover straight down over the pack.
4. Turn the cover counterclockwise.
5. Lift the pack straight up until it clears the drive.
6. Secure the bottom plate to the pack cover by means of the locking handle located on the underside of the bottom plate.
7. Close the drive cover.

7.4.2 Cleaning Disk Packs and Drives

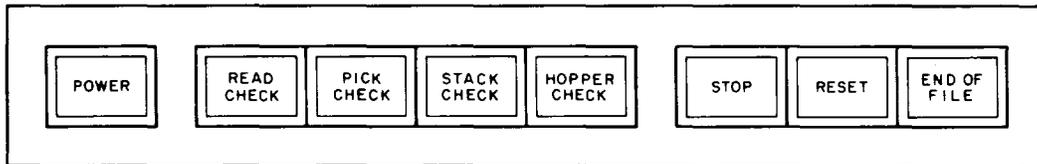
Other than keeping the outside of the drive and the cover of the packs clean, you should leave this task to your field service representative.

DEVICE OPERATION AND MAINTENANCE



11-4094

Model M200



11-0915

Model M1200

Figure 7-10 Card Reader Operator Control Panels

4. Press RESET to allow cards to be read.
5. You may continue loading cards while the reader is operating, provided you maintain tension in the front portion of the deck as you add cards to the rear. Do not add more cards until the hopper is at least half empty.

CAUTION

When you are trying to maintain pressure on the card deck, use just enough pressure to maintain the riffle action to prevent damaging cards or jamming the reader.

6. Usually, all cards are moved through the reader into the stacker. However, if you need to remove cards from the input hopper, simply pull back the follower and remove the card deck.
7. To unload cards from the output stacker, pull the stacker follower back with one hand and remove the card deck from the stacker. Be careful to maintain the order of the deck. The stacker may be unloaded while cards are being read.

7.3.2 Cleaning the Card Reader

There are no cleaning procedures that you must perform on the card reader other than the general ones given at the beginning of the chapter.

DEVICE OPERATION AND MAINTENANCE

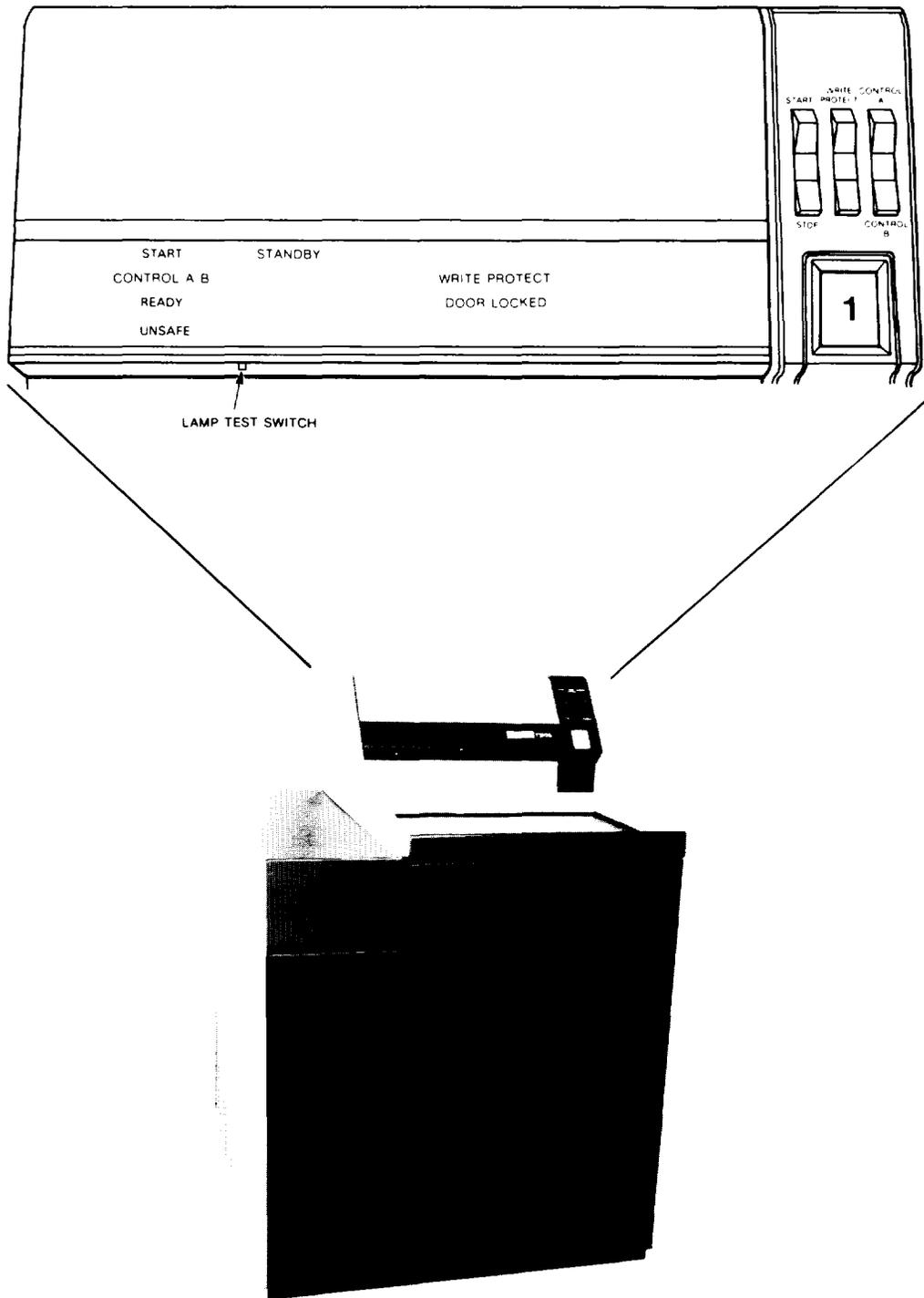


Figure 7-12 RP06 Disk Drive

DEVICE OPERATION AND MAINTENANCE

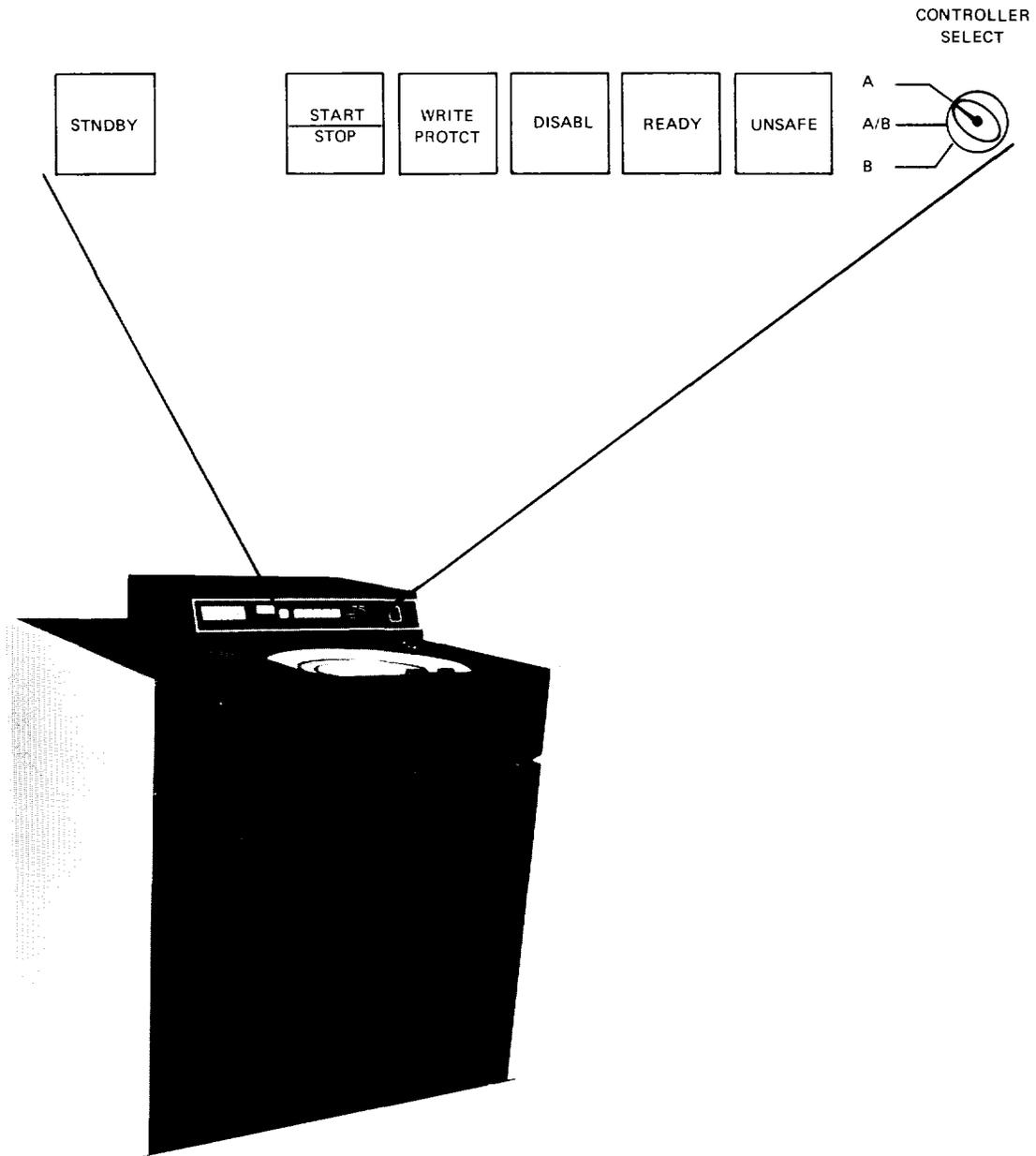


Figure 7-11 RP04 Disk Drive

DEVICE OPERATION AND MAINTENANCE

8. Always return floppy disks to the envelopes supplied with them to protect them from dust and dirt, and store them horizontally.
9. Protect empty envelopes from liquids, dust, and metallic materials.
10. Do not place heavy items on floppy disks.
11. Do not store floppy disks on computer cabinets or in places where dirt can be blown by fans.
12. If a floppy disk has been exposed to less than 59 F (15 C) or more than 90 F (32 C), let it stay in the computer room about five minutes before you use it.

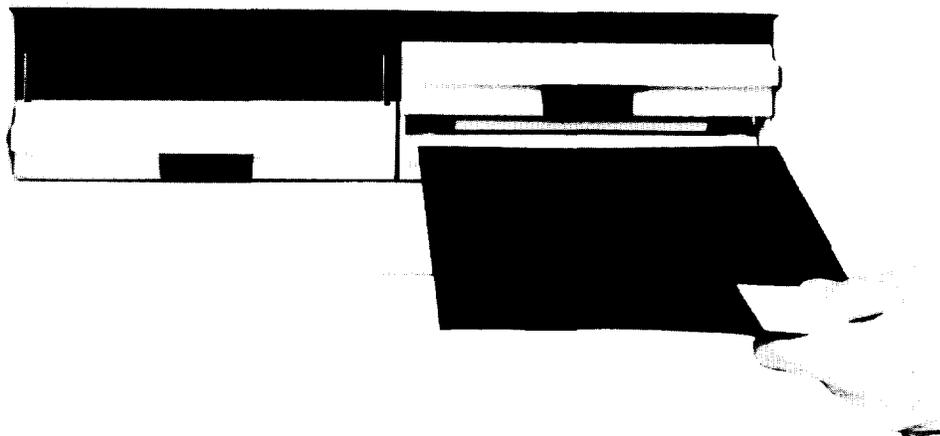


Figure 7-13 Floppy Disk

APPENDIX A
PRIVILEGED COMMANDS

The commands in this appendix can affect the entire system or a specific user; thus, they are called privileged commands. Because they can easily destroy system security, their usage is restricted to users with WHEEL or OPERATOR capability. WHEEL capability allows all privileged commands; OPERATOR capability allows the privileged commands relevant to system operations.

WHEEL and OPERATOR capabilities can be granted when you create or change a directory. Normally, the user name OPERATOR, which you should be using, has the OPERATOR capability.

Before you can successfully issue a privileged command (or run a program requiring WHEEL or OPERATOR capability enabled), you must type the ENABLE command to enable your capabilities. If you are using recognition input, the command is ENABLE (CAPABILITIES). Once you are enabled, the prompt character changes from @ to \$. For example,

```
@ENABLE (CAPABILITIES)
$
```

NOTE

Even if you don't have WHEEL or OPERATOR capability, ENABLE changes the prompt to \$.

When you type a privileged command, first type CTRL/E. (Hold down the key labeled CTRL while you type E.) The CTRL/E prints as ^E on your terminal. Then type the remainder of the command. If you do not have the special capability needed for the command or you have not typed ENABLE, you will get the message:

```
?UNRECOGNIZED COMMAND
```

and be back at TOPS-20 command level.

NOTE

In a BATCH control file, precede CTRL/E commands with @.

PRIVILEGED COMMANDS

When you complete a privileged command, disable your special capabilities by typing DISABLE. The prompt character changes to @. For example,

```
$DISABLE
@
```

NOTE

It is very important that you DISABLE after using a privileged command or running a program needing special capabilities. This safeguard protects you against accidentally damaging part of the system.

You must precede every privileged command with a CTRL/E and follow it with or LINE FEED. In the following discussion of each privileged command, CTRL/E is indicated by ^E. The is shown only when needed for clarity.

You can abbreviate a command by typing as few of the beginning characters as are needed to make the command unique. The guide words for recognition input are given with the command formats.

You can easily get a list of all ^E commands by typing ENABLE and CTRL/E question mark. The following would be printed on your terminal.

```
@ENABLE
$^E? ONE OF THE FOLLOWING:
    CEASE  CREATE   DEFINE  EDDT   PRINT  QUIT   SEND
    SET   SPEAK
```

Some of the error messages you might see while using the privileged commands are given under each command described below. Other error messages are in Appendix A of the DECSYSTEM-20 Monitor Calls Reference Manual.

^ECEASE Command

Command Format

^ECEASE (TIMESHARING AT) downtime (RESUMING AT) uptime

downtime or uptime = date and time given in the format of the examples below. Uptime is optional.

Examples of legal dates are:

6 DEC 77
7-APR-78
11 JULY 1978
24-OCTOBER-1977
NOV 26, 77
APRIL 30, 1978

Other date formats might be accepted; however, they are not recommended because of their ambiguity.

Examples of legal times, with explanations in parentheses, are:

1630	(4:30p.m.)
1200	(noon)
116	(1:16a.m.)
16:30	(4:30p.m.)
00:00	(midnight; the beginning of the day)
1:12:13	(13 seconds after 1:12a.m.)
23:59:59	(1 second before midnight)
+10	(10 minutes after the current time)
+1:00	(1 hour after the current time)
4:09PM	
9:59AM	
11:59:59PM	(1 second before midnight)
12:00AM	(midnight or 00:00:00)
12:00PM	(noon)

----- Function -----

The ^ECEASE command starts system shutdown at a specified time to end timesharing. When the command is in effect, downtime and uptime, if specified, are reported to users when they first type CTRL/C on a terminal. They receive a message similar to:

```
SYSTEM SHUTDOWN SCHEDULED FOR 22-OCT-75 18:00:00,  
UP AGAIN AT 22-OCT-75 20:00:00
```

When you issue the command, you and users already logged in receive one of the following messages.

If the downtime is more than one hour away, the message is similar to:

```
[SYSTEM GOING DOWN AT 29-AUG-77 11:30:00]
```

If the downtime is 60 or fewer minutes away, the message is similar to:

```
[SYSTEM GOING DOWN IN 30 MINUTES AT 29-AUG-77 11:30:00]
```

When the downtime is one minute away, the message is:

```
[SYSTEM GOING DOWN IN ONE MINUTE!!]
```

One of the preceding messages is also printed at hourly intervals before downtime and 30 minutes, 15 minutes, 10 minutes, 5 minutes, and

^ECEASE Command

1 minute before downtime to indicate how long it is before the actual shutdown.

After downtime occurs, if an uptime was specified, a message like the following is output.

```
[SYSTEM DOWN, UP AGAIN AT 29-AUG-77 12:00:00]
```

When downtime occurs, SHUTDOWN COMPLETE is output on the CTY. All jobs are then logged out, except at the CTY, so PTYCON continues to run. Processes under SYSJOB continue to run, but PTYCON subjobs are logged out. Then, no further LOGINS are allowed except from the CTY.

To cancel an existing plan for a shutdown, type ^ECEASE and press RETURN. Then you and all users receive the message:

```
[SHUTDOWN CANCELLED]
```

If you do not know the uptime, omit it by pressing RETURN after (RESUMING AT). The message output to users before they log in will be similar to:

```
SYSTEM SHUTDOWN SCHEDULED FOR 24-OCT-75 16:30:00
```

The uptime is only informational; it does not initiate any automatic startup. To resume timesharing, you should use ^ESEND to say that the system is being reloaded, enter the PARSER with CTRL/\, type SHUTDOWN, and reload via a load switch (Chapter 3).

----- Examples -----

1. By using recognition input and typing ?, you will get the prompt for downtime:

```
$^ECEASE (TIMESHARING AT) ? DATE AND TIME OR NULL TO CANCEL SHUTDOWN  
OR "+" TO ENTER AMOUNT OF TIME FROM NOW
```

Then, if you type ? for uptime, you get:

```
(RESUMING AT) ? DATE AND TIME OR NULL IF UNKNOWN
```

2. To stop timesharing at 6p.m. on January 16, 1978, and have it resume at 8p.m. the same day:

```
@ENABLE (CAPABILITIES)  
$^ECEASE (TIMESHARING AT) 16 JAN 78 1800 (RESUMING AT) 16 JAN 78 2000  
[SYSTEM GOING DOWN AT 16-JAN-78 18:00:00]  
$DISABLE (CAPABILITIES)
```

3. To stop timesharing at the end of the day October 23, 1977, and resume at noon October 24, 1977:

```
@ENABLE  
$^ECEASE 24-OCT-77 12:00AM 24-OCT-77 12:00PM  
[SYSTEM GOING DOWN AT 24-OCT-77 00:00:00]  
$DISABLE
```

4. To stop timesharing one hour from the current time without knowing when the system will resume timesharing:

```
@ENABLE  
$^ECEASE +1:00  
[SYSTEM GOING DOWN IN 60 MINUTES AT 24-OCT-77 16:30:00]  
$DISABLE
```

^ECEASE Command

5. To cancel a shutdown:

```
@ENABLE
$^ECEASE
[SHUTDOWN CANCELLED]
$DISABLE
```

----- Hints -----

After giving the command, look at the output message to check the dates and times. The output times are based on a 24-hour clock, i.e., twelve is added to the hours between noon and midnight. The times are given as hh:mm:ss, where hh is the hour, mm the minute and ss the second.

If you use AM or PM in the time, do not put a space before either of them. For example, 6:00 PM will cause the error message "INVALID DATE FORMAT" explained below. You must use 6:00PM.

For the time, you must specify minutes if you are also specifying hours, i.e., for 6p.m. you must use 6:00PM or 1800. If you use 6PM, it is interpreted as 12:06p.m..

If you give the command with an incorrect date or time, retype the command correctly.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Messages -----

?DOWNTIME HAS ALREADY PASSED

The time you specified for downtime has already gone by.

?DOWNTIME CANNOT BE MORE THAN 7 DAYS IN THE FUTURE

You specified a downtime that was too far in the future.

?INVALID DATE FORMAT

You typed an unacceptable date or you typed a space before AM or PM which causes the time specified not to be recognized as time format.

?INVALID TIME FORMAT

You typed an unacceptable time.

?TIMESHARING WILL RESUME BEFORE IT ENDS

You typed an uptime which comes before the downtime.

?WHEEL OR OPERATOR CAPABILITY REQUIRED

The user name under which you gave the command does not have WHEEL or OPERATOR capability. You should use a job logged in under the user name OPERATOR, which should have OPERATOR capability.

^ECREATE Command

Command Format

^ECREATE (DIRECTORY NAME) structure:<directory>

or

^ECREATE (DIRECTORY NAME) structure:<directory> (PASSWORD) password

structure: = the 1- to 6-character alphanumeric name or logical name for the structure on which you want to create or alter a directory. You must type a colon after the name. Also, you must SMOUNT the structure with this name unless the structure is PS:. If you do not specify structure:, you will create or alter a directory on your currently connected structure. If you have not connected to a specific structure, you are connected by default to PS:, the public structure. Note that a user must have a directory on PS: to be able to log in.

<directory> = 1 to 39 letters, digits, hyphens, or periods representing the name of a directory that you want to create or alter. Angle brackets must enclose the name. This name is used when a user tries to log in to the system, connect to a directory, access a directory, or change directory parameters. You can use recognition on this name if the directory already exists.

password = 1 to 39 letters, digits, or hyphens. You can omit the password here and specify it later in a subcommand. You can omit the password completely for a files-only directory. The password is used when a user tries to log in to the system, connect to a directory, access a directory, or change directory parameters.

----- Function -----

The ^ECREATE command is used to:

1. Create a directory for a user
2. Create a files-only directory
3. Create a directory on a mountable structure
4. Change the parameters for an existing directory
5. Remove a user from the system
6. Remove a user and his files from the system

To create a directory on a structure, the directory name in the ^ECREATE command must be different from any existing directory name on the structure. If the directory name contains a ".", e.g., <T.YOW>, the directory is a subdirectory. Before you can create a subdirectory, you must first create its superior directory, in this case <T>. You can determine the superior directory for a subdirectory by using the name of the subdirectory and eliminating the last "." and the characters after it. For example, the superior directory for <FP.BONS> is <FP>, and the superior directory for <P.HURLEY> is <P>.

^ECREATE Command

After you type the ^ECREATE command using either format and press RETURN, the system outputs [NEW] or [OLD] on the next line and \$\$ on the following line. Be sure you check this output. If [NEW] is output, you are creating a directory. If [OLD] is output, you are altering an existing directory. If the output is not what you expected, type ABORT(RET) and retype the ^ECREATE command. The \$\$ indicates that you can give a subcommand or press RETURN to finish the command. The ^ECREATE subcommands are described later in this appendix.

If you are creating a directory and you press RETURN at subcommand level without giving any subcommands, you create a directory with default parameters (Table A-1).

For example, using recognition input,

```
$^ECREATE (DIRECTORY NAME) <TES>
[NEW]
$$ (RET)
$
```

or simply

```
$^ECREATE <TES>
[NEW]
$$ (RET)
$
```

If you use the format

```
^ECREATE (DIRECTORY NAME) structure:<directory> (PASSWORD) password
```

to create a directory and you press RETURN at subcommand level without giving any subcommands, you create a directory with default parameters except for the password.

For example,

```
$^ECREATE (DIRECTORY NAME) <TES> (PASSWORD) XAP
[NEW]
$$ (RET)
$
```

or simply

```
$^ECREATE <TES> XAP
[NEW]
$$ (RET)
$
```

^ECREATE Command

To change the password for an existing directory, you can use either ^ECREATE format. However, one format requires the PASSWORD subcommand. For example,

```
$^ECREATE SQM:<HOGAN> (PASSWORD) JOHNQ  
[OLD]  
$$ (RET)  
$
```

or

```
$^ECREATE SQM:<HOGAN>  
[OLD]  
$$PASSWORD JOHNQ  
$$ (RET)  
$
```

Also, see Hint under PASSWORD subcommand, described later, for another way of changing a password.

To create a directory with some nondefault parameters or to alter some directory parameters of an existing directory, you must give the appropriate subcommands to ^ECREATE. You can list the subcommands available with ^ECREATE by typing ? at subcommand level.

```
$^ECREATE <TES>  
[NEW]  
$$? CONFIRM WITH CARRIAGE RETURN  
OR ONE OF THE FOLLOWING:  
ABORT ABSOLUTE-ARPANET-SOCKETS  
ACCOUNT-DEFAULT ARPANET-WIZARD  
CONFIDENTIAL DEFAULT-FILE-PROTECTION  
DIRECTORY-GROUP ENQ-DEQ  
FILES-ONLY GENERATIONS  
IPCF KILL  
LIST MAINTENANCE  
MAXIMUM-SUBDIRECTORIES NOT  
NUMBER OPERATOR  
PASSWORD PERMANENT  
PROTECTION SUBDIRECTORY-USER-GROUP  
USER-GROUP WHEEL  
WORKING  
$$
```

When you give a subcommand, you only need to type the beginning characters up to the point that the abbreviation is unique. If you want to see the guide words, press the ESCAPE key after you give the subcommand or its abbreviation. You can also see the help text for the argument by typing ? in place of the argument. After the help text is output, the subcommand is repeated up to the argument. At any point before you end the subcommand, you can delete the subcommand line by typing CTRL/U.

To end the subcommand, press RETURN or LINE FEED. When you finish giving subcommands to alter, kill, or create a directory, you must type an extra RETURN or LINE FEED for confirmation. This means YOU MUST PRESS RETURN OR LINE FEED TO THE LAST \$\$.

For the system to ignore the creation of a directory or any changes to an old directory since the last ^ECREATE, type a CTRL/C any time during the ^ECREATE, or type ABORT at subcommand level, instead of waiting to give the final RETURN or LINE FEED.

^ECREATE Command

NOTE

Remember that you need to use a subcommand only if you want to assign a nondefault value when you are creating a directory or if you want to change any value for an existing directory. See Table A-1 for a list of all the subcommands and their defaults. You can also print the defaults on your terminal by giving the LIST subcommand to ^ECREATE before you specify any other subcommands.

If you change a directory parameter for a logged-in user and the user complains that the change hasn't occurred, tell the user to log out and log in again. Some directory parameters don't take effect until a user logs in.

^ECREATE Command

Table A-1
Summary of ^ECREATE Subcommands

Subcommand	Default	Help Text
ABORT	-	(1) <input type="text" value="RET"/>
ABSOLUTE-ARPANET-SOCKETS (CAPABILITY)	NOT	<input type="text" value="RET"/>
ACCOUNT-DEFAULT (FOR LOGIN)	NONE SET	DEFAULT ACCOUNT FOR USERS LOGGING INTO THIS DIRECTORY
ARPANET-WIZARD (CAPABILITY)	NOT	<input type="text" value="RET"/>
CONFIDENTIAL (INFORMATION ACCESS CAPABILITY)	NOT	<input type="text" value="RET"/>
DEFAULT-FILE-PROTECTION (NUMBER)	777700	6-DIGIT OCTAL NUMBER
DIRECTORY-GROUP (NUMBER)	NONE SET	DECIMAL GROUP NUMBER
ENQ-DEQ (CAPABILITY)	NOT	<input type="text" value="RET"/>
FILES-ONLY	NOT	<input type="text" value="RET"/>
GENERATIONS (TO KEEP)	1	DECIMAL NUMBER OF GENERATIONS TO RETAIN PER FILE
IPCF (CAPABILITY)	NOT	<input type="text" value="RET"/>
KILL (THIS DIRECTORY)	-	<input type="text" value="RET"/>
LIST	-	ONE OF THE FOLLOWING: FAST NAME-ONLY VERBOSE
MAINTENANCE (CAPABILITY)	NOT	<input type="text" value="RET"/>
MAXIMUM-SUBDIRECTORIES (ALLOWED)	NONE SET	DECIMAL NUMBER OF SUBDIRECTORIES ALLOWED UNDER THIS DIRECTORY
NOT	-	ONE OF THE FOLLOWING: CONFIDENTIAL DIRECTORY-GROUP ENQ-DEQ FILES-ONLY IPCF KILL MAINTENANCE OPERATOR SUBDIRECTORY-USER-GROUP USER-GROUP WHEEL
NUMBER (OF DIRECTORY)	FREE ONE	OCTAL DIRECTORY NUMBER
OPERATOR (CAPABILITY)	NOT	<input type="text" value="RET"/>
PASSWORD	NONE SET	1 TO 39 ALPHANUMERIC CHARACTERS OR HYPHENS
PERMANENT (DISK STORAGE PAGE LIMIT)	250	DECIMAL NUMBER OF PAGES
PROTECTION (OF DIRECTORY)	777700	6-DIGIT OCTAL NUMBER
SUBDIRECTORY-USER-GROUP (ALLOWED)	NONE SET	DECIMAL GROUP NUMBER
USER-GROUP (NUMBER)	NONE SET	DECIMAL GROUP NUMBER
WHEEL (CAPABILITY)	NOT	<input type="text" value="RET"/>
WORKING (DISK STORAGE PAGE LIMIT)	250	DECIMAL NUMBER OF PAGES

(1) in this column means CONFIRM WITH CARRIAGE RETURN.

^ECREATE Command

The ^ECREATE subcommands and their guide words, functions, arguments, and defaults are given below. The discussion of a subcommand also contains the explanation of any corresponding negative function.

ABORT

This subcommand returns you to system command level immediately. It is equivalent to typing CTRL/C at any time before you give the final RETURN or LINE FEED to ^ECREATE. As a result, the system ignores the creation of a directory or any changes to an old directory since the last ^ECREATE.

----- Example -----

If you give an incorrect name, you can simply abort and type ^ECREATE again with the correct name.

```
$^ECREATE (DIRECTORY NAME) <TESTING>
[NEW]
$$ABORT
$^ECREATE (DIRECTORY NAME) FORT:<TESTING>
[OLD]
$$
```

ABSOLUTE-ARPANET-SOCKETS (CAPABILITY)

This subcommand grants a user the ABSOLUTE ARPANET SOCKETS capability. This capability allows a user to specify absolute socket numbers in a certain privileged monitor call on a system running TOPS-20AN.

Give this capability only to those users who need it and who can be trusted, because a user with this capability can break system security.

NOT ABSOLUTE-ARPANET-SOCKETS, which is the default, withholds this capability from the user.

----- Example -----

To give a TOPS-20AN user the ABSOLUTE ARPANET SOCKETS capability:

```
$^ECREATE <CIRINO>
[NEW]
$$ABSOLUTE-ARPANET-SOCKETS (CAPABILITY)
$$
```

ACCOUNT-DEFAULT (FOR LOGIN) account

This subcommand specifies the default account for users logging into this directory. A user with a default account can press RETURN for the account in the LOGIN command when logging into this directory, and the account specified in this subcommand will be used.

If this subcommand is not given, no default account is set. To eliminate a default account, give this subcommand without an argument. To change a default account, give this subcommand with the new default account as the argument. At some installations, a user can also change an account default with the command SET DIRECTORY ACCOUNT-DEFAULT.

^ECREATE Command

----- Example -----

If user J.SMITH wants his default account to be PAYROLL.TEST, type the following:

```
$^ECREATE <J.SMITH>
[OLD]
$$ACCOUNT-DEFAULT (FOR LOGIN) PAYROLL.TEST
$$
```

----- Hint -----

You can also use ENABLE and the SET DIRECTORY ACCOUNT-DEFAULT command to change the default account. When you have OPERATOR capability enabled, you can type a fictitious password in the command.

ARPANET-WIZARD (CAPABILITY)

This subcommand grants a user the ARPANET WIZARD capability. This capability allows a user to execute certain privileged monitor calls on a system running TOPS-20AN.

Give this capability only to those users who need it and who can be trusted, because a user with this capability can break system security.

NOT ARPANET-WIZARD, which is the default, withholds this capability from the user.

----- Example -----

To give a TOPS-20AN user the ARPANET WIZARD capability:

```
$^ECREATE <CROSSLAND>
[NEW]
$$ARPANET-WIZARD (CAPABILITY)
$$
```

CONFIDENTIAL (INFORMATION ACCESS CAPABILITY)

This subcommand grants a user the confidential information access capability. This capability lets a user obtain some confidential information within the system via certain monitor calls.

Give this capability only to those users who need it and who can be trusted, because a user with this capability can break system security.

NOT CONFIDENTIAL, which is the default, withholds this capability from the user.

----- Example -----

If you need to give a user the confidential information access capability, give the CONFIDENTIAL subcommand.

```
$^ECREATE (DIRECTORY NAME) <TESS>
[NEW]
$$CONFIDENTIAL (INFORMATION ACCESS CAPABILITY)
$$
```

^ECREATE Command

DEFAULT-FILE-PROTECTION (NUMBER) 6-digit octal number

This subcommand specifies the default file access protection for files within this directory. (You can find an explanation of file access protection in the DECSYSTEM-20 User's Guide.) The argument for this command is a 6-digit octal number. If you do not use this subcommand, the default protection is 777700.

To change the default file protection for an existing directory, give this subcommand with the new protection. At some installations, a user can also change this default with the command SET DIRECTORY FILE-PROTECTION-DEFAULT.

Do not confuse this value with the protection of the directory which is set with the PROTECTION (OF DIRECTORY) subcommand.

----- Example -----

To make the default file protection 775252 for user TES:

```
$^ECREATE <TES>
[NEW]
$$DEFAULT-FILE-PROTECTION 775252
$$
```

----- Hint -----

You can also use ENABLE and the SET DIRECTORY FILE-PROTECTION-DEFAULT command to change the default file protection. When you have OPERATOR capability enabled, you can type a fictitious password in the command.

DIRECTORY-GROUP (NUMBER) decimal group number

This subcommand specifies a group number for a directory. If the group number is *n*, users in group *n* have group-level access to this directory. (See the subcommand USER (GROUP) to put a user into a group.) The group-level access is determined by the directory and file access protection. (Refer to the DECSYSTEM-20 User's Guide for an explanation of access protection.)

The argument is a decimal number from 1 to 262143 ($2^{18}-1$). Because you can specify only one number for the argument, you must repeat the subcommand for each group that is allowed to access the files in the directory. You can specify a maximum of 19 different group numbers for a directory.

NOT DIRECTORY decimal number prevents the directory from being accessed at the group level by users in that group. Because a directory does not belong to any group by default, NOT DIRECTORY is needed to prohibit group access only if DIRECTORY had been given for that group. You must repeat the subcommand for each group for which you want access prohibited.

----- Examples -----

1. To make a directory accessible to groups 4 and 9:

```
$^ECREATE <WHITE>
[NEW]
$$DIRECTORY-GROUP (NUMBER) 4
$$DIRECTORY-GROUP (NUMBER) 9
$$
```

^ECREATE Command

2. If you want to create a directory of library subroutines called <LIBRARY>, which is accessible to users in group 6, give the subcommand DIRECTORY 6 when you create <LIBRARY>.

```
$^ECREATE <LIBRARY>
[NEW]
$$DIRECTORY-GROUP (NUMBER) 6
$$
```

Then, to allow a user to access the library, put the user in user group 6 (see USER subcommand).

```
$^ECREATE (NAME) <ROSEN>
[OLD]
$$USER-GROUP (NUMBER) 6
$$
```

ENQ-DEQ (CAPABILITY)

This subcommand gives a user the ability to do certain ENQUEUE and DEQUEUE functions.

Give this capability only to those users who need it and who can be trusted, because a user with this capability can break system security.

NOT ENQ-DEQ, which is the default, withholds this ability from a user.

----- Example -----

```
$^ECREATE <UPDATE>
[NEW]
$$ENQ-DEQ
$$
```

FILES-ONLY

This subcommand makes the directory simply a storage place for files. A user can't log in to or access this directory. The subdirectories of a FILES-ONLY directory must be FILES-ONLY. This directory cannot receive mail, but the directory PS:<SYSTEM>, which is FILES-ONLY, is treated as a special case and can receive mail.

NOT FILES-ONLY, which is the default, allows a user to log in under the directory.

If a FILES-ONLY directory does not have a password, connecting to it depends on directory protection and user groups.

----- Example -----

To make the directory <LIBRARY> on structure FORT FILES-ONLY:

```
$^ECREATE FORT:<LIBRARY>
[NEW]
$$FILES-ONLY
$$
```

^ECREATE Command

----- Hint -----

To temporarily disable a user from logging in and leave his files intact, simply make his directory FILES-ONLY. Then, to restore his log-in privilege, make his directory NOT FILES-ONLY. This method does not change any of the other directory parameters.

GENERATIONS (TO KEEP) decimal number

This specifies the default number of generations that a file can have in this directory. The argument must be a decimal number from 0 to 63, where 0 means an infinite number. The default is 1. Currently, it is advisable to use this default to limit disk usage.

To change the number of default generations, use this subcommand and specify a new number. At some installations, a user can also change this default with the command SET DIRECTORY GENERATION-RETENTION-COUNT-DEFAULT.

----- Example -----

To allow a user two generations of a file by default:

```
$^ECREATE (DIRECTORY NAME) <TRESS>
[NEW]
$$GENERATIONS (TO KEEP) 2
$$
```

----- Hint -----

You can also use ENABLE and the SET DIRECTORY GENERATION-RETENTION-COUNT-DEFAULT command to change the default number of generations to keep. When you have OPERATOR capability enabled, you can type a fictitious password in the command.

IPCF (CAPABILITY)

This subcommand grants a user the capability of executing all privileged IPCF functions.

Give this capability only to those users who need it and who can be trusted, because a user with this capability can break system security.

NOT IPCF, which is the default, withholds this capability from the user.

----- Example -----

To give user the IPCF capability:

```
$^ECREATE <COMMUNICATOR>
[NEW]
$$IPCF
$$
```

^ECREATE Command

KILL (THIS DIRECTORY)

This subcommand allows you to eliminate a directory from the system. After you give the subcommand, you are asked to [CONFIRM]. [CONFIRM] warns you that KILL will also delete all the files in the directory. At this time be sure that you typed the correct directory. If you did not, type CTRL/C to abort immediately. If it is the right directory, you should press RETURN after [CONFIRM]. When you get the next \$\$, you can decide either to continue with the KILL by pressing RETURN again or to cancel the KILL by typing NOT KILL.

NOT KILL, which is the default, cancels a KILL subcommand if it is given before the ^ECREATE command is completed.

----- Hints -----

Do not kill a directory that is logged in, because the system will not be able to use that user's job number until TOPS-20 is reloaded. If you must kill that directory, log out the user first and then kill the directory.

When you kill a directory, you lose all the files in the directory.

If you try to kill a directory and get:

```
?DIRECTORY FILE IS MAPPED
```

the directory is being used. You cannot kill the directory until it is not in use.

If you try to kill a directory and get:

```
?INTERNAL FORMAT OF DIRECTORY IS INCORRECT
```

refer to Section 6.5.2.1 to delete the directory.

----- Examples -----

1. To eliminate the user ALPHONSE from the system:

```
$^ECREATE PS:<ALPHONSE>  
[OLD]  
$$KILL (RET)  
[CONFIRM] (RET)  
$$ (RET)  
$
```

2. To prevent killing a directory when you discover that you typed the wrong name:

```
$^ECREATE <ROSENBERG>  
[OLD]  
$$KILL (RET)  
[CONFIRM]^C  
$
```

^ECREATE Command

LIST argument

This subcommand lets you check the directory parameters. Consequently, it helps to use it before you terminate the ^ECREATE command, so you can make any necessary changes.

The acceptable arguments are FAST, NAME-ONLY, and VERBOSE. If no argument is typed, FAST is assumed.

If you type LIST FAST or LIST ^(REL), the output is a short list equivalent to the output from ^EPRINT, providing the directory was previously created. Items not listed have default values.

If you type LIST NAME-ONLY, the output gives the name of the directory that you specified after ^ECREATE. This is equivalent to the output from ^EPRINT with the NAME-ONLY subcommand.

If you type LIST VERBOSE, the output lists all the parameters except NOT ABSOLUTE-ARPANET-SOCKETS and NOT ARPANET-WIZARD. This is equivalent to the output from ^EPRINT with the VERBOSE subcommand, providing the directory was previously completed.

If you typed KILL as a subcommand, the LIST output is simply KILLED. For example,

```
$$KILL
[CONFIRM]
$$LIST
  KILLED
$$
```

----- Examples -----

1. To get a complete list of parameters for <SMITH> and increase the permanent disk storage page limit by 200 pages:

```
$^ECREATE <SMITH>
[OLD]
$$LIST VERBOSE
NAME <SMITH>
PASSWORD PLAZA
WORKING DISK STORAGE PAGE LIMIT 800
PERMANENT DISK STORAGE PAGE LIMIT 400
WHEEL
NOT OPERATOR
NOT CONFIDENTIAL INFORMATION ACCESS
NOT MAINTENANCE
NOT IPCF
NOT ENQ-DEQ
NOT FILES-ONLY
NUMBER OF DIRECTORY 142
DEFAULT FILE PROTECTION 777700
ACCOUNT DEFAULT FOR LOGIN BASIC
PROTECTION OF DIRECTORY 777700
GENERATIONS TO KEEP 1
MAXIMUM SUBDIRECTORIES ALLOWED 0
LAST LOGIN 10-AUG-77 07:58:28
USER GROUPS - NONE SET
DIRECTORY GROUPS - NONE SET
SUBDIRECTORY USER GROUPS ALLOWED - NONE SET

$$PERMANENT (DISK STORAGE PAGE LIMIT) 600
$$
```

^ECREATE Command

2. To get a brief list of parameters for <SMITH>:

```
$^ECREATE <SMITH>
[OLD]
$$LIST
NAME <SMITH>
PASSWORD PLAZA
WORKING DISK STORAGE PAGE LIMIT 800
PERMANENT DISK STORAGE PAGE LIMIT 600
WHEEL
NUMBER OF DIRECTORY 142
ACCOUNT DEFAULT FOR LOGIN BASIC
LAST LOGIN 10-AUG-77 07:58:28

$$
```

3. To list just the name of the directory.

```
$^ECREATE <SMITH>
[OLD]
$$LIST NAME-ONLY
NAME <SMITH>
$$
```

MAINTENANCE (CAPABILITY)

This subcommand grants a user the MAINTENANCE capability. It allows the user to execute certain system maintenance functions.

Give this capability only to those users who need it and who can be trusted, because a user with this capability can break system security.

NOT MAINTENANCE, which is the default, withholds this capability from the user.

----- Example -----

To give the field service directory the MAINTENANCE capability:

```
$^ECREATE <FIELD-SERVICE>
[NEW]
$$MAINTENANCE
$$
```

MAXIMUM-SUBDIRECTORIES (ALLOWED) decimal number

This subcommand specifies a limit for the sum of the number of subdirectories that can be created in the directory and the number of subdirectories that can currently be delegated to subdirectories in the directory.

A number of subdirectories is delegated when the value for MAXIMUM-SUBDIRECTORIES is specified for a subdirectory in the directory. After subdirectories are delegated, the value for MAXIMUM-SUBDIRECTORIES in the superior directory is automatically decremented by the number delegated.

The default value is zero. You can change the value for this parameter by giving the subcommand with a new value.

^ECREATE Command

----- Example -----

To let user WIZARD create two subdirectories and allow those subdirectories to create a total of two subdirectories:

```
$^ECREATE <WIZARD>
[OLD]
$$MAXIMUM-SUBDIRECTORIES (ALLOWED) 4
$$
```

NOT subcommand

The NOT must be followed by one of the following subcommands:

```
ABSOLUTE-ARPANET-SOCKETS
ARPANET-WIZARD
CONFIDENTIAL
DIRECTORY-GROUP
ENQ-DEQ
FILES-ONLY
IPCF
KILL
MAINTENANCE
OPERATOR
SUBDIRECTORY-USER-GROUP
USER-GROUP
WHEEL
```

The function for NOT subcommand is discussed under each subcommand, e.g., NOT USER-GROUP is described under USER-GROUP.

----- Examples -----

1. To take away the ENQ-DEQ capability from JONES:

```
$^ECREATE <JONES>
[OLD]
$$NOT ENQ-DEQ
$$
$DISABLE
@
```

2. To prohibit the directory <GAMES> on structure FUN from being accessed by users in group 9 when the directory protection doesn't allow all users to access <GAMES>:

```
$^ECREATE FUN:<GAMES>
[OLD]
$$NOT DIRECTORY-GROUP 9
$$
$DISABLE
@
```

NUMBER (OF DIRECTORY) octal directory number

This subcommand allows you to assign an unused directory number to the directory that you are creating. The number must be octal. Certain programs use a specific directory number. Also, directory numbers 1 through 17 are reserved for use by DIGITAL. Currently, <ROOT-DIRECTORY>, <SYSTEM>, <SUBSYS>, <ACCOUNTS>, <OPERATOR>, and <SPOOL> must have directory numbers 1 to 6, respectively.

^ECREATE Command

If you do not use this subcommand, a default number is chosen by TOPS-20. You should always use the default number unless the directory must have a specific number.

While creating a new directory, you can change a directory number you specified by repeating the subcommand with a new number or by giving the subcommand NUMBER 0 to get the default. However, once you create the directory, you can't change this number.

----- Example -----

If you have to re-create the directory <OPERATOR>, which must have directory number 5:

```
$^ECREATE <OPERATOR>
[NEW]
$$NUMBER (OF DIRECTORY) 5
$$
```

OPERATOR (CAPABILITY)

This subcommand grants a user the OPERATOR capability. Normally, it is given to the operator's directory <OPERATOR>.

NOT OPERATOR, which is the default, withholds the capability from a user.

----- Example -----

To give <2-OPERATOR> the OPERATOR capability:

```
$^ECREATE <2-OPERATOR>
[NEW]
$$OPERATOR
$$
```

PASSWORD 1 to 39 alphanumeric characters or hyphens

This subcommand specifies the password for the directory. A user must give his correct password to log in to the system. The identifier may be 1 to 39 letters, digits, or hyphens.

If this subcommand is not given and the password is not specified on the same line as ^ECREATE, no password is set. To eliminate a password, give this subcommand without an argument.

You can change an existing password by giving this subcommand with the new password. At some installations, a user can also change a password with the command SET DIRECTORY PASSWORD.

----- Examples -----

1. To change a user's password to NEW-ONE:

```
$^ECREATE <JONES>
[OLD]
$$PASSWORD NEW-ONE
$$
$DISABLE
```

^ECREATE Command

2. To create a new directory named ELLIS with a password of JOAN:

```
$^ECREATE <ELLIS>
[NEW]
$$PASSWORD JOAN
$$
```

----- Hint -----

You can also use ENABLE and the SET DIRECTORY PASSWORD command to change the password. When you have OPERATOR capability enabled, you can type a fictitious password for the OLD PASSWORD in the command. This method also has the advantage of not echoing the new password.

PERMANENT (DISK STORAGE PAGE LIMIT) decimal number of pages

This subcommand specifies the limit of the sum of disk space that the directory can have for permanent storage and the disk space that can be delegated to subdirectories in the directory for permanent storage.

Disk space for permanent storage is delegated when the value for PERMANENT is specified for a subdirectory in the directory. After permanent storage is delegated, the value for PERMANENT in the superior directory is automatically decremented by the amount delegated.

The argument is a number of pages, where a page is 512 36-bit words. The default value is 250 pages. You should make permanent storage less than or equal to working storage. You can change the value for this parameter by giving the subcommand with a new value.

----- Example -----

To give user FOX 200 pages of permanent storage:

```
$^ECREATE <FOX>
[NEW]
$$PERMANENT (DISK STORAGE PAGE LIMIT) 200
$$
```

PROTECTION (OF DIRECTORY) 6-digit octal number

This subcommand specifies the access protection for a directory. (You can find an explanation of directory access protection in the DECSYSTEM-20 User's Guide.) The argument for this command is a 6-digit octal number. If you do not use this subcommand, the directory protection is 777700.

To change the protection of an existing directory, give this subcommand with the new protection. At some installations, a user can also change the protection of a directory with the command SET DIRECTORY PROTECTION.

^ECREATE Command

----- Example -----

To make the <LIBRARY> directory protection 775252 on structure APPL:

```
$^ECREATE APPL:<LIBRARY>
[NEW]
$$PROTECTION (OF DIRECTORY) 775252
$$
```

----- Hint -----

You can also use ENABLE and the SET DIRECTORY PROTECTION command to change the protection. When you have OPERATOR capability enabled, you can type a fictitious password in the command.

SUBDIRECTORY-USER-GROUP (ALLOWED) decimal group number

This subcommand specifies what user groups can be specified in the USER-GROUP or SUBDIRECTORY-USER-GROUP subcommands for a subdirectory in this directory.

The argument is a decimal number from 1 to 262143 ($2^{18}-1$). You can specify a maximum of 19 different groups. Because you can give only one number for the argument, however, you must repeat the subcommand for each different group. If this subcommand is being specified for a subdirectory, the user group number must be in the list of subdirectory user groups allowed in the superior directory.

NOT SUBDIRECTORY-USER-GROUP decimal number removes a group from the list of groups allowed. To remove more than one group from the list, you must repeat the subcommand for each group.

----- Example -----

To allow the subdirectories of directory <A> to specify user groups or subdirectory user groups of 1, 2, 3, or 4:

```
$^ECREATE <A>
[NEW]
$$SUBDIRECTORY-USER-GROUP (ALLOWED) 1
$$SUBDIRECTORY-USER-GROUP (ALLOWED) 2
$$SUBDIRECTORY-USER-GROUP (ALLOWED) 3
$$SUBDIRECTORY-USER-GROUP (ALLOWED) 4
$$
```

USER-GROUP (NUMBER) decimal group number

This subcommand places the user of the directory in a group and gives the user group-level access to other directories with the same directory group number. (See the subcommand DIRECTORY-GROUP to specify a directory group number.)

The argument is a decimal number from 1 to 262143 ($2^{18}-1$). A user can belong to a maximum of 19 different groups. However, because you can give only one number for the argument, you must repeat the subcommand for each different group. If this subcommand is being specified for a subdirectory, the user group number must be in the list of subdirectory user groups allowed in the superior directory.

^ECREATE Command

NOT USER-GROUP decimal number removes a user from the group number specified. To remove a user from more than one group, you must repeat the subcommand for each group.

----- Examples -----

1. To put a user in groups 3, 9, and 27:

```
$^ECREATE <TES>
[NEW]
$$USER-GROUP 3
$$USER-GROUP 9
$$USER-GROUP 27
$$
```

2. To allow an instructor whose directory is <TEACH> to have group level access to his students' directories, which have a directory group number of 5:

```
$^ECREATE <TEACH>
[NEW]
$$USER-GROUP 5
$$
```

3. To remove a user from group 3:

```
$^ECREATE <TES>
[OLD]
$$NOT USER-GROUP 3
$$ 
$
```

WHEEL (CAPABILITY)

This subcommand grants the WHEEL capability to a user.

NOTE

Be very cautious about giving this capability, because it allows a user to do anything on the system and possibly destroy system security.

NOT WHEEL, which is the default, withholds this capability from a user.

----- Example -----

To give user SYSTEM-ACE WHEEL capability:

```
$^ECREATE <SYSTEM-ACE>
[NEW]
$$WHEEL
$$
```

^ECREATE Command

WORKING (DISK STORAGE PAGE LIMIT) decimal number of pages

This subcommand specifies the limit of the sum of temporary working space that a user of the directory can have on disk while he is logged in and the temporary working space that can be delegated to subdirectories in the directory.

Temporary working space is delegated when the value for WORKING is specified for a subdirectory in the directory. After temporary working space is delegated, the value for WORKING in the superior directory is automatically decremented by the amount delegated.

The argument is a number of pages, where a page is 512 36-bit words. The default value is 250 pages. You should allow at least as much working storage as permanent storage. You can change the value for this parameter by giving the subcommand with a new value.

----- Example -----

To give user FOX 400 pages of working storage:

```
$^ECREATE <FOX>  
[NEW]  
$$WORKING (DISK STORAGE PAGE LIMIT) 400  
$$
```

^ECREATE Command

----- Examples -----

1. To create a directory with all default values:

```
@ENABLE
$^ECREATE <STUDENT-1> S]
[NEW]
$$
$
```

2. To create a new directory with some nondefault parameters:

```
@ENABLE
$^ECREATE (DIRECTORY NAME) <WHITEMAN>
[NEW]
$$PASSWORD PAULAM
$$ACCOUNT-DEFAULT (FOR LOGIN) BANK.MC
$$WORKING (DISK STORAGE PAGE LIMIT) 500
$$PERMANENT (DISK STORAGE PAGE LIMIT) 300
$$USER-GROUP (NUMBER) 5
$$USER-GROUP (NUMBER) 9
$$DIRECTORY-GROUP (NUMBER) 5
$$LIST
NAME <WHITEMAN>
PASSWORD PAULAM
WORKING DISK STORAGE PAGE LIMIT 500
PERMANENT DISK STORAGE PAGE LIMIT 300
ACCOUNT DEFAULT FOR LOGIN BANK.MC
USER GROUPS 5, 9
DIRECTORY GROUPS 5

$$LIST VERBOSE
NAME <WHITEMAN>
PASSWORD PAULAM
WORKING DISK STORAGE PAGE LIMIT 500
PERMANENT DISK STORAGE PAGE LIMIT 300
NOT WHEEL
NOT OPERATOR
NOT CONFIDENTIAL INFORMATION ACCESS
NOT MAINTENANCE
NOT IPCF
NOT ENQ-DEQ
NOT FILES-ONLY
NO DIRECTORY NUMBER
DEFAULT FILE PROTECTION 777700
ACCOUNT DEFAULT FOR LOGIN BANK.MC
PROTECTION OF DIRECTORY 777700
GENERATIONS TO KEEP 1
MAXIMUM SUBDIRECTORIES ALLOWED 0
NEVER LOGGED IN
USER GROUPS 5, 9
DIRECTORY GROUPS 5
SUBDIRECTORY USER GROUPS ALLOWED - NONE SET

$$
$
```

^ECREATE Command

3. To alter a parameter for a directory:

```
$^ECREATE <WHITEMAN>
[OLD]
$$CONFIDENTIAL (INFORMATION ACCESS CAPABILITY)
$$LIST VERBOSE
NAME <WHITEMAN>
PASSWORD PAULAM
WORKING DISK STORAGE PAGE LIMIT 500
PERMANENT DISK STORAGE PAGE LIMIT 300
NOT WHEEL
NOT OPERATOR
CONFIDENTIAL INFORMATION ACCESS
NOT MAINTENANCE
NOT IPCF
NOT ENQ-DEQ
NOT FILES-ONLY
NUMBER OF DIRECTORY 606
DEFAULT FILE PROTECTION 777700
ACCOUNT DEFAULT FOR LOGIN BANK.MC
PROTECTION OF DIRECTORY 777700
GENERATIONS TO KEEP 1
MAXIMUM SUBDIRECTORIES ALLOWED 0
LAST LOGIN 11-AUG-77 15:30:47
USER GROUPS 5, 9
DIRECTORY GROUPS 5
SUBDIRECTORY USER GROUPS ALLOWED - NONE SET

$$
$
```

4. To delete a directory from the system:

```
$^ECREATE <WHITEMAN>
[OLD]
$$KILL
[CONFIRM]
$$
$
```

5. To create the files-only directory <MANUALS> on structure DSKA with DSKA previously SMOUNTEd:

```
$^ECREATE DSKA:<MANUALS>
[NEW]
$$FILES-ONLY
$$
$
```

6. To create PS:<P> and allow it to have 50 subdirectories in user groups 3 and/or 4:

```
$^ECREATE PS:<P>
[NEW]
$$WORKING 12500
$$PERMANENT 12500
$$MAXIMUM-SUBDIRECTORIES 50
$$$SUBDIRECTORY-USER-GROUP (ALLOWED) 3
$$$SUBDIRECTORY-USER-GROUP (ALLOWED) 4
$$
$
```

^ECREATE Command

7. To create the subdirectory <P.HURLEY> in user group 3 when <P> already exists:

```
$^ECREATE <P.HURLEY>
[NEW]
$$PASSWORD YUIOP
$$USER-GROUP 3
$$
$
```

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Messages -----

After some of the following error messages, you will also get the message:

PLEASE FIX INCORRECT SUBCOMMANDS.

After any error, you automatically return to subcommand level with the prompt \$\$\$. You can then give more subcommands to correct the error, specify additional directory parameters, or type ABORT and then correct the problem.

?6-DIGIT VALUE ONLY

The maximum value accepted is six octal digits.

?CAN'T ADD NEW GROUP; BUFFER FULL

You specified over 19 directory groups or user groups.

?CARRIAGE RETURN OR SUBCOMMAND REQUIRED
?DOES NOT MATCH SWITCH OR KEYWORD

You typed an invalid subcommand.

?DIRECTORY FILE IS MAPPED

You tried to kill a directory that was being used.

?DIRECTORY STILL CONTAINS SUBDIRECTORY.

You are not allowed to delete a directory that has subdirectories.

?FIRST NONSPACE CHARACTER IS NOT A DIGIT

You must type a numeric argument.

?GROUP ALREADY EXISTS

The group number that you typed was previously given. Perhaps you meant to type a different number.

?GROUP NUMBERS MUST BE BETWEEN 1 AND 262143.

A user group number or directory group number must be between 1 and 262143, inclusive.

^ECREATE Command

?ILLEGAL TO CREATE NON-FILES-ONLY SUBDIRECTORY UNDER FILES-ONLY DIRECTORY.

You are not allowed to create a non-FILES-ONLY subdirectory under a FILES-ONLY directory.

?ILLEGAL TO DELETE CONNECTED DIRECTORY.

You are not allowed to delete your connected directory. If you really want to delete this directory, connect to a different directory and then delete this directory.

?ILLEGAL TO DELETE LOGGED-IN DIRECTORY.

You are not allowed to delete your logged-in directory. If you really want to delete this directory, delete it while you are logged in under a different directory.

?INTERNAL FORMAT OF DIRECTORY IS INCORRECT

You tried to kill a directory whose internal format is incorrect. (See Hints under the KILL subcommand.)

?INVALID CHARACTER IN NUMBER

You typed a nondigit in a numeric argument or you typed a nonoctal digit in an octal argument.

?INVALID DIRECTORY NUMBER.

The number that you tried to give to a new directory has already been given to another directory.

?INVALID DIRECTORY SPECIFICATION

You typed a directory incorrectly. Perhaps you forgot the right angle bracket (>).

?INVALID STRUCTURE NAME

You specified a structure name incorrectly. Perhaps you omitted the angle brackets around a directory name, or you omitted the colon after the structure name.

?INVALID USER GROUP.

You specified a number for USER-GROUP or SUBDIRECTORY-USER-GROUP that is not in the superior directories list of subdirectory user groups allowed.

?MUST BE 0-63

The default number of generations to keep must be 0 to 63.

?NO GROUP TO REMOVE

The group number that you tried to remove was never assigned.

?NOT CONFIRMED

You must press RETURN or LINE FEED at the end of the command.

^ECREATE Command

?OVERFLOW (NUMBER IS GREATER THAN 2**35)

The argument you specified is too large.

?REQUEST EXCEEDS SUPERIOR DIRECTORY PERMANENT QUOTA.

The number of pages you specified for a subdirectory's permanent disk-storage page limit exceeds the permanent disk-storage page limit remaining for the superior directory.

?REQUEST EXCEEDS SUPERIOR DIRECTORY SUBDIRECTORY QUOTA.

You tried to create a subdirectory when the superior directory allows no more subdirectories, or you specified a value for MAXIMUM-SUBDIRECTORIES that exceeds what is allowed by the superior directory.

?REQUEST EXCEEDS SUPERIOR DIRECTORY WORKING QUOTA.

The number of pages you specified for a subdirectory's working disk-storage page limit exceeds the working disk-storage page limit remaining for the superior directory.

?STRUCTURE str: NOT MOUNTED

The structure you specified, str:, has not been mounted. Be sure you typed the structure name correctly. Also, SMOUNT a structure before you create a directory on it.

?SUBDIRECTORY QUOTA INSUFFICIENT FOR EXISTING SUBDIRECTORIES.

You tried to specify a value for MAXIMUM-SUBDIRECTORIES that is less than the number of subdirectories already created and delegated.

?SUPERIOR DIRECTORY DOES NOT EXIST.

You tried to create the subdirectory <directory.xxx>, but <directory>, the superior directory, does not exist.

?SUPERIOR DIRECTORY FULL

Either <ROOT-DIRECTORY> on the structure where you are trying to create a directory cannot contain any more directories, or you are trying to create <directory.xxx> and <directory> cannot contain any more directories.

?WHEEL OR OPERATOR CAPABILITY REQUIRED.

You must have WHEEL or OPERATOR capability to create, alter, or kill a directory.

?WORKING SPACE INSUFFICIENT FOR CURRENT ALLOCATION.

You tried to specify a value for WORKING that is less than the current disk space already being used by the directory.

?YOU CAN'T CHANGE THE NUMBER OF AN OLD DIRECTORY

You can't change the number of an existing directory.

^EDEFINE Command

Command Format

^EDEFINE (SYSTEM LOGICAL NAME) lognam: (AS) filespec

lognam: = a 1- to 39-character alphanumeric abbreviation or system logical name to be defined or deleted, or * to delete all system logical names.

filespec = one or more file specifications separated by commas, where the file specification is any combination of device or structure name, directory name, filename, file type, generation number, and wild cards. If you are deleting a system logical name, do not type any file specification.

----- Function -----

The ^EDEFINE command lets you define or delete system logical names. A system logical name is a logical name (a list of file specifications and other logical names that tells the system where and in what order to search for a file) that applies to all users on the system. Whenever you give this command, you will be asked to CONFIRM. If you have typed the command correctly, press RETURN. Otherwise, type CTRL/C and retype the command.

----- Examples -----

1. To define SYS: as PS:<SUBSYS> and PS:<NEW> using all guide words and prompts:

```
@ENABLE
$^EDEFINE (SYSTEM LOGICAL NAME) ?
LOGICAL NAME TO DEFINE OR DELETE,
OR "*" TO DELETE ALL
$^EDEFINE (SYSTEM LOGICAL NAME) SYS: (AS) ? DEFINITION LIST OR
NULL TO DELETE
$^EDEFINE (SYSTEM LOGICAL NAME) SYS: (AS) PS:<SUBSYS>,PS:<NEW>
[CONFIRM]
$DISABLE
```

2. To define BAS: as PS:<BASIC>:

```
@ENABLE
$^EDEFINE (SYSTEM LOGICAL NAME) BAS: (AS) PS:<BASIC>
[CONFIRM]
$DISABLE
```

3. To delete the logical name BAS:

```
@ENABLE
$^EDEFINE (SYSTEM LOGICAL NAME) BAS: (AS)
[CONFIRM]
$DISABLE
```

4. To define TEST: as PS:<TEST>TSTPAK.FOR.3:

```
@ENABLE
$^EDEFINE TEST: PS:<TEST>TSTPAK.FOR.3
[CONFIRM]
$DISABLE
```

^EDEFINE Command

----- Hints -----

Do not confuse the ^EDEFINE command with the DEFINE command. The DEFINE command defines a logical name for only the user that issues the command. (See the DECSYSTEM-20 User's Guide.)

To check the current list of system logical names, use the command INFORMATION (ABOUT) LOGICAL NAMES with the argument SYSTEM. You should use this command before and after you add or delete a system logical name. For example:

```
@INFORMATION (ABOUT) LOGICAL-NAMES (OF) SYSTEM
CR: => CDR:
DS: => DSK:
HLP: => SYS:
LL: => LPT:
LP: => LPT:
NEW: => PS:<LOADTEST>,PS:<NEXT-RELEASE>
SY: => SYS:
SYS: => PS:<LOADTEST>,PS:<NEXT-RELEASE>,PS:<FIELD-IMAGE>,PS:<UNSUPPORT
ED>,PS:<REL>
TT: => TTY:
```

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Warning Message -----

```
%LOGICAL NAME lognam: WAS NOT DEFINED
```

The system logical name "lognam:" that you tried to delete was not defined.

----- Error Messages -----

```
?DIRECTORY TERMINATING DELIMITER IS NOT PRECEDED BY A VALID BEGINNING
DELIMITER
```

You made an error in typing the file specification. Perhaps you forgot a comma between two directory names.

```
?INVALID CHARACTER IN FILENAME
```

You typed an invalid character in the file specification.

```
?MORE THAN ONE NAME FIELD IS NOT ALLOWED
```

You made an error in the file specification. You probably typed a period instead of a comma.

```
?WHEEL OR OPERATOR CAPABILITY REQUIRED
```

The user name under which you are logged in doesn't have OPERATOR or WHEEL capability. Log in under OPERATOR, which should have OPERATOR capability.

^EEDDT Command

Command Format

^EEDDT

----- Function -----

The ^EEDDT command should be used only by a system programmer. It transfers control to a DDT looking at the EXEC with symbols. If necessary, it gets DDT from the file SYS.UDDT.EXE and stores a symbol table pointer into it. Normally, this command is used only by a system programmer to debug the EXEC.

----- Hint -----

If you get into EDDT by mistake, type \$G to get back to the EXEC.

@ENABLE
\$^EEDDT
DDT
\$G
\$DISABLE

----- Requirement -----

WHEEL capability enabled.

----- Error Message -----

?

You do not have WHEEL capability, which you need to use this command.

^EPRINT Command

Command Format

^EPRINT (DIRECTORY NAME) structure:<directory>,
subcommand

structure: = the 1- to 6-character alphanumeric name or logical name for the structure containing the directory for which you want directory information. If you do not specify structure:, your currently connected structure is assumed. If you have not connected to a specific structure, you are connected by default to PS:, the public structure. You cannot use recognition on the structure name.

<directory> = 1 to 39 letters, digits, hyphens, or periods representing the name of the directory for which you want information. You can use recognition on this name.

subcommand = FAST, NAME-ONLY, or VERBOSE. If you omit the comma and the subcommand, FAST is assumed.

----- Function -----

The ^EPRINT command prints on your terminal the parameters of the directory specified. When you specify the NAME-ONLY subcommand, the structure and directory name that you specified after ^EPRINT are output. When you specify the VERBOSE subcommand, all the parameters listed below, except NOT ABSOLUTE-ARPANET-SOCKETS and NOT ARPANET-WIZARD, are output. If you use the FAST subcommand or no argument, certain default-value parameters are suppressed as indicated below. The values are set when you use ^ECREATE.

PARAMETER	SUPPRESSED IF
NAME	-
PASSWORD	-
WORKING DISK STORAGE PAGE LIMIT	-
PERMANENT DISK STORAGE PAGE LIMIT	-
WHEEL	NOT WHEEL
OPERATOR	NOT OPERATOR
CONFIDENTIAL INFORMATION ACCESS	NOT CONFIDENTIAL INFORMATION ACCESS
MAINTENANCE	NOT MAINTENANCE
IPCF	NOT IPCF
ENQ-DEQ	NOT ENQ-DEQ
ARPANET-WIZARD	NOT ARPANET-WIZARD
ABSOLUTE-ARPANET-SOCKETS	NOT ABSOLUTE-ARPANET-SOCKETS
FILES-ONLY	NOT FILES-ONLY
NUMBER OF DIRECTORY	-
DEFAULT FILE PROTECTION	777700
ACCOUNT DEFAULT FOR LOGIN	NONE SET
PROTECTION OF DIRECTORY	777700
GENERATIONS TO KEEP	1
MAXIMUM SUBDIRECTORIES ALLOWED	0
LAST LOGIN	NEVER LOGGED IN
USER GROUPS	NONE SET
DIRECTORY GROUPS	NONE SET
SUBDIRECTORY USER GROUPS ALLOWED	NONE SET

(See ^ECREATE for a definition of the parameters.)

^EPRINT Command

----- Examples -----

1. To print a brief list of parameters for directory <PETER>:

```
@ENABLE
$^EPRINT <PETER>
NAME PS:<PETER>
PASSWORD SAMPLE
WORKING DISK STORAGE PAGE LIMIT 100
PERMANENT DISK STORAGE PAGE LIMIT 70
MAINTENANCE
NUMBER OF DIRECTORY 523
ACCOUNT DEFAULT FOR LOGIN INVENTORY
LAST LOGIN 24-AUG-77 13:05:52

$DISABLE
```

2. To print all the parameters for directory <PETER>:

```
$^EPRINT <PETER>,
$$VERBOSE
$$ (RET)
NAME PS:<PETER>
PASSWORD SAMPLE
WORKING DISK STORAGE PAGE LIMIT 100
PERMANENT DISK STORAGE PAGE LIMIT 70
NOT WHEEL
NOT OPERATOR
NOT CONFIDENTIAL INFORMATION ACCESS
MAINTENANCE
NOT IPCF
NOT ENQ-DEQ
NOT FILES-ONLY
NUMBER OF DIRECTORY 523
DEFAULT FILE PROTECTION 777700
ACCOUNT DEFAULT FOR LOGIN INVENTORY
PROTECTION OF DIRECTORY 777700
GENERATIONS TO KEEP 1
MAXIMUM SUBDIRECTORIES ALLOWED 0
LAST LOGIN 24-AUG-77 13:05:52
USER GROUPS - NONE SET
DIRECTORY GROUPS - NONE SET
SUBDIRECTORY USER GROUPS ALLOWED - NONE SET

$DISABLE
```

3. To use recognition input, determine arguments, and then get a brief list of parameters:

```
@ENABLE
$^EPRINT (DIRECTORY NAME) <ALAN>,
$$? CONFIRM WITH CARRIAGE RETURN
OR ONE OF THE FOLLOWING:
FAST NAME-ONLY VERBOSE
$$
NAME PS:<ALAN>
PASSWORD TEST
WORKING DISK STORAGE PAGE LIMIT 800
PERMANENT DISK STORAGE PAGE LIMIT 400
NUMBER OF DIRECTORY 142
ACCOUNT DEFAULT FOR LOGIN 120
LAST LOGIN 27-OCT-75 07:45:30

$DISABLE
```

^EPRINT Command

----- Hints -----

If you want to see the values of all the parameters, except the ARPANET ones, use the VERBOSE subcommand. Once you are familiar with default values, you will seldom need to use VERBOSE.

You can also enable OPERATOR capability and use the INFORMATION (ABOUT) DIRECTORY command instead of ^EPRINT.

If you need to change a parameter, use ^ECREATE.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Messages -----

?INVALID STRUCTURE NAME

You specified a structure name incorrectly. Perhaps you omitted the angle brackets around a directory name, or you omitted the colon after the structure name.

?NO SUCH DIRECTORY

The user name that you typed does not exist. Type the command again with a valid user name; try recognition input.

?WHEEL OR OPERATOR CAPABILITY REQUIRED

The user name that you are logged in under, doesn't have these capabilities. Issue the command to a job logged in as OPERATOR, which should have OPERATOR capability.

^EQUIT Command

Command Format

^EQUIT

----- Function -----

The ^EQUIT command should be used only by a system programmer. It halts the EXEC (the TOPS-20 command processor) and returns control to the program under which the EXEC is being run. If the EXEC is not being run under another program, the command is illegal except for users with WHEEL capability enabled. For the privileged user the command is normally used to get into the MINI-EXEC. The prompt to indicate that you are in the MINI-EXEC is MX>. Some commands for the MINI-EXEC are documented in the DECSYSTEM-20 Software Installation Guide, because they are useful in the installation process.

----- Example -----

```
@ENABLE
$^EQUIT

INTERRUPT AT 17377
MX>START
$DISABLE (CAPABILITIES)
```

----- Hint -----

If you get into the MINI-EXEC by mistake, type S after the prompt. START will be output immediately. Press RETURN and you will be back at EXEC level. (See the example above.)

Once you use QUIT to enter the MINI-EXEC, whenever you type CTRL/P thereafter, you enter the MINI-EXEC. The CTRL/P has this effect until you log out.

----- Requirement -----

WHEEL capability enabled.

----- Error Message -----

?

Because you are not running the EXEC under another program, you need the WHEEL capability.

^ESEND Command

Command Format

^ESEND (TO) number (MESSAGE) message

number = octal terminal line # or * for all terminals
message = line of text followed by RET

----- Function -----

This command gives you the ability to send a message immediately to all users or to a particular user on the system. However, it does not send the message to PTYS (pseudo-terminals). When you end the command, the message is then output on the specified terminal(s).

----- Examples -----

1. To immediately tell all users to free up disk space, because available disk space is getting low:

```
@ENABLE
$^ESEND * PLEASE DELETE AND EXPUNGE UNNECESSARY FILES NOW

[FROM OPERATOR: PLEASE DELETE AND EXPUNGE UNNECESSARY FILES NOW]
$DISABLE
@
```

2. To immediately send the message "JUST TESTING" to TTY31:

```
@ENABLE
$^ESEND 31 JUST TESTING
$DISABLE
@
```

----- Hints -----

Pressing ESCAPE for the number is equivalent to typing *.

Use SYSTAT to determine a user's line number.

To include a "?" in the message, type CTRL/V before the "?".

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Message -----

?WHEEL OR OPERATOR CAPABILITY REQUIRED

The user name under which you are logged in does not have WHEEL or OPERATOR capability. Log in under OPERATOR, which should have OPERATOR capability.

^ESET Command

Command Format

^ESET argument

```
argument = ARPANET
           DATE-AND-TIME
           LOGINS-ALLOWED
           NO
           OPERATOR-IN-ATTENDANCE
           RUN-TIME-GUARANTEE
           STRUCTURE
           TERMINAL
```

----- Function -----

The ^ESET command allows you to set various parameters for a job, for the system, and for terminals.

----- Example -----

To see the various arguments to ^ESET, type ? in place of the argument.

```
@ENABLE
$^ESET ? ONE OF THE FOLLOWING:
ARPANET          DATA-AND-TIME
LOGINS-ALLOWED  NO
OPERATOR-IN-ATTENDANCE  RUN-TIME-GUARANTEE
STRUCTURE        TERMINAL
```

----- Requirement -----

OPERATOR or WHEEL capability enabled.

^ESET ARPANET status

This command allows you to turn the ARPANET service on or off by typing ON or OFF for the status. If you press RETURN or ESCAPE for the status, ON is assumed.

----- Example -----

To turn on ARPANET service:

```
@ENABLE
$^ESET ARPANET ON
$DISABLE
```

^ESET DATE-AND-TIME (TO) date and time

This command allows you to correct the system date and time while the system is running. This is helpful if you type an incorrect date or time when you start the system. It is also useful when the system time has gotten behind because the system has been down for a while and then continued.

See the examples of legal dates and times under ^ECEASE.

^ESET Command

----- Example -----

To change the date and time to February 29, 1976, 8a.m.:

```
@ENABLE
$^ESET DATE-AND-TIME (TO) 29-FEB-76 800
$DISABLE
```

----- Hint -----

If you set time back, you can seriously affect accounting and the compilation of user programs. Therefore, you should notify all users that you had to set the time back.

After you give the SET DATE-AND-TIME command, you can check the results with the DAYTIME command.

^ESET LOGINS-ALLOWED (ON) terminal

```
terminal = ANY-TERMINAL
           ARPANET-TERMINALS
           CONSOLE-TERMINAL
           LOCAL-TERMINALS
           PSEUDO-TERMINALS
           REMOTE-TERMINALS
```

This command allows you to specify from which terminals the system will accept LOGINS. The argument you give adds to the previous list of terminals allowed; it does not change the list to what you just typed.

Before the SYSJOB.RUN file is processed at system startup, LOGINS are allowed from PSEUDO-TERMINALS and the CONSOLE-TERMINAL. After SYSJOB.RUN is processed LOGINS are allowed from any terminal.

----- Hints -----

To check the current LOGINS-ALLOWED, type the system command INFORMATION (ABOUT) SYSTEM-STATUS. For example,

```
$INFORMATION (ABOUT) SYSTEM-STATUS
OPERATOR IS NOT IN ATTENDANCE
REMOTE LOGINS ALLOWED
LOCAL LOGINS ALLOWED
PSEUDO-TERMINAL LOGINS ALLOWED
ARPANET TERMINAL LOGINS ALLOWED
CONSOLE TERMINAL LOGIN ALLOWED
ACCOUNTING IS BEING DONE
ACCOUNT VALIDATION IS ENABLED
```

To disallow certain terminals, use ^ESET NO LOGINS-ALLOWED described below.

----- Examples -----

1. To find out the different arguments, type ? for the argument:

```
@ENABLE
$^ESET LOGINS-ALLOWED (ON) ? ONE OF THE FOLLOWING:
      ANY-TERMINAL   ARPANET-TERMINALS   CONSOLE-TERMINAL
      LOCAL-TERMINALS PSEUDO-TERMINALS   REMOTE-TERMINALS
```

^ESET Command

2. If you previously had LOGINS at the console terminal only and you also want to allow pseudo-terminal LOGINS:

```
@ENABLE
$^ESET LOGINS-ALLOWED (ON) PSEUDO-TERMINALS
```

3. To allow LOGINS from anywhere:

```
@ENABLE
$^ESET LOGINS-ALLOWED (ON) ANY-TERMINAL
```

^ESET NO LOGINS-ALLOWED (ON) terminal

```
terminal = ANY-TERMINAL
           ARPANET-TERMINALS
           CONSOLE-TERMINAL
           LOCAL-TERMINALS
           PSEUDO-TERMINALS
           REMOTE TERMINALS
```

This command lets you disallow LOGINS from certain terminals. Thus, you can prevent certain users from accessing the system. The command removes the specified terminals from the list of terminals from which LOGINS are allowed.

----- Example -----

To disallow LOGINS from remote terminals:

```
@ENABLE
$^ESET NO LOGINS-ALLOWED (ON) REMOTE-TERMINALS
```

^ESET OPERATOR-IN-ATTENDANCE

This command lets users know that there is an operator present. (See Section 3.4.1.) It also allows LPTSPL to do forms changing.

----- Example -----

When you return after no operator was present, type:

```
@ENABLE
$^ESET OPERATOR-IN-ATTENDANCE
```

^ESET NO OPERATOR-IN-ATTENDANCE

This command lets users know that there is no operator present. It also prevents certain system programs, e.g., OPLEAS, from indefinitely waiting for an operator to respond. Be sure to give this command if you must leave the computer room temporarily or if your shift is about to end and there is no operator coming on duty (refer to Section 3.4.2).

This is the default setting.

----- Example -----

To indicate that there won't be an operator present, send a message to all users that you are leaving, and then type:

```
@ENABLE
$^ESET NO OPERATOR-IN-ATTENDANCE
```

^ESET Command

^ESET RUN-TIME-GUARANTEE (FOR JOB) n (to) m (PERCENT)

n = job number

m = percentage of runtime from 1 to 100

This allows you to guarantee at least a certain percentage of runtime to a particular job. Then, from the time a job wants to run, the scheduler in TOPS-20 will try to give the job at least the specified percentage of central processing time, for as long as the job continues to run. Be extremely cautious about giving a job 100 percent, because you may not be able to give another command.

----- Example -----

To guarantee 5 percent runtime to job 11:

@ENABLE

\$^ESET RUN-TIME-GUARANTEE (FOR JOB) 11 (TO) 5 (PERCENT)

^ESET NO RUN-TIME-GUARANTEE (FOR JOB) number

This allows you to cancel a runtime guarantee for a job.

----- Example -----

To cancel the runtime guarantee for job 11:

@ENABLE

\$^ESET NO RUN-TIME-GUARANTEE (FOR JOB) 11

^ESET STRUCTURE (NAME) name: (TO BE) state

name = the physical identification of the structure or the alias for the structure. The physical identification is written on the structure when the structure is created. The alias is a temporary name given to a structure while it is mounted. The alias is the same as the physical identification unless a privileged user has specified a different alias. You must use the physical identification if you specify the state ACKNOWLEDGED or IGNORED. Otherwise, use the alias.

state = ACKNOWLEDGED

AVAILABLE

DISMOUNTED

DOMESTIC

FOREIGN

IGNORED

UNAVAILABLE

This command allows you to change the state of a mounted structure or the state of a structure that a user might request for mounting.

The following list explains the function of each state.

ACKNOWLEDGED

This state allows OPLEAS to mount the structure with the physical identification specified. Thus, it cancels the effect of IGNORED. By default, all structures are initially ACKNOWLEDGED.

^ESET Command

AVAILABLE

This state allows users to S MOUNT the structure with the alias specified. Thus, it cancels the effect of UNAVAILABLE. By default, all mounted structures are initially AVAILABLE.

DISMOUNTED

This state immediately makes the structure with the alias specified unknown to the system, even if someone is using the structure. A user who has a file open on that structure will get a fatal error. Therefore, you should specify this state only when a problem prevents you from dismounting the structure in any other way.

You should first try to dismount the structure with the SREMOVE command. If that fails, set the structure to the IGNORED state. (See IGNORED below.) Then, warn all users via ^ESEND to finish their work on the structure and to SDISMOUNT the structure by a certain time. (The INFORMATION (ABOUT) STRUCTURE command will tell you who is using the structure.) When the time you specified occurs, try SREMOVE again. If SREMOVE fails again, you can set the structure to be DISMOUNTED. If there are users on the structure, you will be asked to confirm the command. To complete the command, press RETURN after [CONFIRM]. To abort the command, type CTRL/C after [CONFIRM].

DOMESTIC

This state declares the structure with the alias specified to be DOMESTIC. A user can ACCESS or CONNECT to his directory on a DOMESTIC structure without giving a password.

The opposite state of DOMESTIC is FOREIGN. When a new structure is mounted, its default state is FOREIGN, unless there is a DOMESTIC command for that structure in the file SYSTEM:OPLEAS.CMD.

FOREIGN

This state declares the structure with the alias specified to be FOREIGN. A user must always give a password to ACCESS or CONNECT to a directory on a FOREIGN structure.

The opposite state of FOREIGN is DOMESTIC. When a new structure is mounted, its default state is FOREIGN, unless there is a DOMESTIC command for that structure in the file PS:<SYSTEM>OPLEAS.CMD. (See Section 4.4.2.)

IGNORED

This state prevents OPLEAS from mounting the structure with the physical identification specified. This command does not prevent the S MOUNT of a structure that is currently recognized by the system, i. e., listed by INFORMATION (ABOUT) STRUCTURE *.

To allow an IGNORED structure to be mounted by OPLEAS, you must change its state to ACKNOWLEDGED. By default, all structures are initially ACKNOWLEDGED.

^ESET Command

UNAVAILABLE

This state prevents any SMOUNT of the structure with the alias specified, but allows those users who currently have the structure mounted to finish their work on that structure.

To allow any SMOUNT of the structure, you must change the state to AVAILABLE. By default, when a structure is first mounted, it is AVAILABLE.

----- Example -----

1. To make a structure unavailable for any SMOUNT:

```
@ENABLE
$^ESET STRUCTURE (NAME) QTY: (TO BE) UNAVAILABLE (TO NEW
USERS)
$DISABLE
```

2. To prevent a structure from being mounted by OPLEAS:

```
@ENABLE
$^ESET STRUCTURE (NAME) FTN: (TO BE) IGNORED (AS A NEW
MOUNTABLE STRUCTURE)
$DISABLE
```

Later, to allow the structure to be mounted:

```
@ENABLE
$^ESET STRUCTURE (NAME) FTN: (TO BE) ACKNOWLEDGED (AS A NEW
MOUNTABLE STRUCTURE)
$DISABLE
```

3. To forcibly dismount a structure if users are not cooperating in SDISMOUNTing the structure, or if a job that has the structure mounted is hung and cannot SDISMOUNT:

```
@ENABLE
$^ESET STRUCTURE (NAME) FOO: (TO BE) IGNORED
$^ESET STRUCTURE (NAME) FOO: (TO BE) DISMOUNTED
THERE IS STILL A MOUNT COUNT OF 1, AND AN OPEN FILE COUNT OF
0.
[CONFIRM]
[STRUCTURE FOO: HAS BEEN DISMOUNTED]
$DISABLE
```

Note that RETURN was pressed after [CONFIRM].

4. If you want to run CHECKD on structure PYR, set the state of the structure to IGNORED and ask users to SDISMOUNT the structure. Then SREMOVE the structure. After you have completed the SREMOVE, be sure you set the structure on-line. Then you can run CHECKD on that structure.

```
@ENABLE
$^ESET STRUCTURE PYR: IGNORED
$^ESEND * PLEASE SDISMOUNT PYR NOW

[FROM OPERATOR: PLEASE SDISMOUNT PYR NOW]
$DISABLE
@SREMOVE PYR
```

^ESET Command

^ESET TERMINAL n SPEED (OF INPUT) s (OF OUTPUT) t

n = octal number of terminal
s = input speed in baud units
t = output speed in baud units

This command works like the user command TERMINAL SPEED, but it also allows you to set the input and output speed for any terminal on the system. If you give only one speed, it applies to both input and output.

----- Examples -----

1. To set a terminal's input and output speed to 300:

```
@ENABLE  
$^ESET TER 20 SPEED 300
```

2. To set a terminal's input speed to 150 and output speed to 2400:

```
@ENABLE  
$^ESET TER 20 SPEED 150 2400
```

----- Warning Message -----

%STRUCTURE WASN'T BEING IGNORED

You tried to acknowledge a structure that wasn't being ignored.

----- Error Messages -----

?INVALID DATE FORMAT

You typed the date incorrectly.

?INVALID TIME FORMAT

You typed the time incorrectly.

?NON-DIGIT TYPED WHERE NUMBER REQUIRED

You must type a number for the argument.

?NON-OCTAL DIGIT TYPED WHERE OCTAL NUMBER REQUIRED

You must type an octal number for the argument.

?NONEXISTENT JOB

You typed a job number that does not exist.

?RUN TIME GUARANTEE PERCENTAGE MUST BE FROM 1-100

When you specify the percentage for RUN-TIME-GUARANTEE, you must give a number from 1 to 100.

?STRUCTURE IS NOT MOUNTED

The structure that you specified is not mounted.

?WHEEL OR OPERATOR CAPABILITY REQUIRED

You need OPERATOR or WHEEL capability enabled.

^ESPEAK Command

Command Format

```
^ESPEAK (TO SYSJOB)
[PLEASE TYPE SYSJOB COMMANDS - END WITH ^Z]
text
```

text = SYSJOB commands

----- Function -----

The ^ESPEAK command lets you give commands at any time to SYSJOB which is run under job 0. It allows you to check the status of the processes under SYSJOB and restart them, if necessary. All text on the line following the prompt message up to CTRL/Z is input to SYSJOB. Actually, the text is written into the file PS:<SYSTEM>SYSJOB.COMMANDS. Then, a wakeup request is issued to SYSJOB which will read the file and perform the commands in it. Thus, it is equivalent to:

```
COPY (FROM) TTY: (TO) PS:<SYSTEM>SYSJOB.COMMANDS
```

as soon as SYSJOB wakes up and reads the file.

The text must consist of SYSJOB commands. The same commands are recognized in both the SYSJOB.COMMANDS file and the SYSJOB.RUN file (Section 3.4), which SYSJOB reads at system startup. The commands are in the form of a keyword, possibly followed by arguments. The commands can be divided into three types:

1. Those affecting an inferior process:

FREEZE, KILL, RESUME, RUN

2. Those affecting a job being controlled by a PTY (pseudo-terminal):

CCJOB, JOB, KILLJOB

3. Others:

RELOAD, STATUS

The SYSJOB commands, which you must use to communicate with processes run under SYSJOB, are explained below. For ease of discussion they are not alphabetical.

PROCESS COMMANDS

RUN filespec of program

This command creates an inferior process and runs the specified program in it. The process is identified by a name consisting of the first six characters of the name portion of the filespec.

KILL name

The command kills the process of the specified name.

FREEZE name

This command executes a freeze (or temporary suspension of execution) on the process of the specified name. This may later be undone by the RESUME command.

^ESPEAK Command

RESUME name

This command executes a resume (or continue execution) on the process of the specified name, thus undoing the effect of a previous FREEZE.

JOB COMMANDS

JOB ident textstring

This command transmits text to a job via a PTY. The ident is an arbitrary small integer not related to the system job number of the job being controlled. You should choose the smallest number (beginning with 0) not presently in use when a new job is desired. Thereafter, that number will identify that job for SYSJOB.

The textstring is a string of system commands surrounded by any character not occurring within the string, e.g., /a string of characters/. The string may include REF1, other format control characters, and control characters. You must indicate a control character by typing an up-arrow followed by the character. If you want to indicate an up-arrow, when it is not being used to indicate a control character, type two up-arrows. If there is no job in existence when a JOB command is executed, a ^C is sent ahead of the specified text to create one. Note, however, that the job is not automatically logged in, so a LOGIN command must be given via the JOB command.

Any output from the job will be handled by SYSJOB and typed on the CTY. Each line will be prefixed with the ident number of the job which produced the output. Output will only be typed at the end of a line, so prompt characters coming from a job will not be seen until the remainder of the line has been input.

KILLJOB ident

This forces a LOGOUT of the specified job.

CCJOB ident

This transmits two ^C's to the specified job and holds any further input until the ^C's have been processed.

OTHER COMMANDS

STATUS

This command prints the CTY the status of all existing inferior processes and jobs presently known to SYSJOB.

RELOAD

This command causes SYSJOB to reload and restart itself. Use this with great caution, as it will cause an abrupt termination of all inferior processes and the detaching of any PTY-controlled jobs. If possible, you should kill all processes and log out all jobs before the RELOAD is executed. This command allows you to put a new version of SYSJOB into operation during timesharing and provides a possibility of recovery after a severe SYSJOB malfunction.

^ESPEAK Command

----- Examples -----

1. A sample SYSTEM:SYSJOB.RUN file:

```
RUN SYS:INFO
RUN SYS:MAILER
RUN SYS:QUASAR
JOB 0 /LOG OPERATOR XX OPERATOR
ENA
^ESET LOGINS ANY
^ESEND * SYSTEM IN OPERATION
PTYCON
GET SYSTEM:PTYCON.ATO
/
```

2. To check the status of SYSJOB's inferior processes and jobs:

```
@ENABLE
$^ESPEAK
 [PLEASE TYPE SYSJOB COMMANDS - END WITH ^Z]
STATUS
^Z
```

Remember that the output will go to the CTY. If you are at another terminal, see the hint below.

A sample of the CTY output follows.

```
SYSJOB STATUS AT 1-SEP-77 1001
 0 INFO   DISMS AT 1574  1-SEP-77 1001
 1 MAILER DISMS AT 1264  1-SEP-77 1001
 2 QUASAR DISMS AT 1520  1-SEP-77 1001
0: NO JOB
```

3. To restart INFO:

```
@ENABLE
$^ESPEAK
 [PLEASE TYPE SYSJOB COMMAND - END WITH ^Z]
RUN SYS:INFO
^Z
```

----- Hint -----

All SYSJOB output appears on the CTY. Therefore, if you are at a terminal other than the CTY and you want to see SYSJOB output, enable for OPERATOR or WHEEL capability, talk to the terminal that is the CTY, issue SYSJOB commands, and type BREAK after you have seen the output.

----- Requirement -----

OPERATOR or WHEEL capability enabled.

----- Error Message -----

? CAN'T GET JFN ON PS:<SYSTEM>SYSJOB.COMMANDS

You do not have OPERATOR or WHEEL capability enabled. Therefore, you can't write PS:<SYSTEM>SYSJOB.COMMANDS. You should log in under OPERATOR, which normally has OPERATOR capability. Type ENABLE and reissue the ^ESPEAK command.



APPENDIX B

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

When you load the system via the DISK or FLOPPY load switch, a default path is taken through the KL initialization operator dialog, also called KLINIT. Thus, without asking you any questions, it does the following:

1. Loads the KL processor microcode from the microcode file on the bootstrap device.
2. Configures and enables any cache memory according to the KLINIT configuration file, KL.CFG. If this file is not on the bootstrap device, all available cache is enabled.
3. Configures and interleaves KL memory according to the KLINIT configuration file, KL.CFG. If this file is not on the bootstrap device, all available memory is configured with the highest possible interleaving (4-way, 2-way, or 1-way).
4. Loads BOOT.EXB, the standard KL bootstrap program, either from disk or floppy and starts it. BOOT then loads and starts the standard TOPS-20 monitor, PS:<SYSTEM>MONITR.EXE.

Therefore, if you do not want all these defaults, you must enter the dialog mode of KLINIT. Then, you can do the following:

1. Verify the microcode
2. Configure any cache memory as you want it
3. Configure KL memory as you want it
4. Load and start any bootstrap program
5. Give switches to the bootstrap program
6. Load and start any monitor from disk or magnetic tape

To enter the dialog, you must load the system, using the switch register with at least switches 0, 1, and 2 set (Chapter 3). Then, when you load the system, KLINIT starts asking you questions.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

During the dialog you should keep the following in mind.

1. All answers to a question must end with `RET`.
2. RUBOUT or DELETE deletes a character.
3. `RET` alone selects the first answer to the question, which is the default answer.
4. CTRL/Z terminates the operator dialog and exits to the RSX-20F monitor without changing KL.CFG (item 14 below).
5. CTRL/U deletes what you've typed on the current line, so you can retype the input.
6. NO to the ENTER DIALOG question skips the rest of the dialog and assumes all the default answers.
7. BACK to any question repeats the previous question.
8. RESTART to the EXIT question goes back to the first question in the dialog.
9. ESCAPE to any question restarts the dialog. Note that ESCAPE does not echo on your terminal.
10. An unacceptable answer produces an error message and causes the question to be repeated.
11. The dialog continues with the next question listed unless stated otherwise.
12. The standard KL bootstrap program, called BOOT, is in the file BOOT.EXB on the bootstrap device (disk or floppy).
13. The microcode is on the bootstrap device in the files KLA.MCB and KLX.MCB.
14. Information specifying the configuration of KL memory and cache memory is in the KLINIT configuration file, KL.CFG, on the bootstrap device. If the file does not exist at the time you are going through the dialog, the front-end software will create it after the bootstrap is loaded. The file will reflect your answers to the CACHE and MEMORY questions in the dialog. Also, if you specify an answer other than the default to the CACHE or MEMORY questions, the front-end software updates the configuration file after the bootstrap is loaded. Note that CTRL/Z does not cause KL.CFG to be written or updated. However, EXIT to question 1, or YES to question 9, does.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

B.1 KLINIT OPERATOR DIALOG

The following are all possible questions from KLINIT and the acceptable answers. However, depending on the answers that you give, some questions may be omitted in an actual dialog. When a question from KLINIT appears on your console terminal, it is preceded by KLI -- and then prompts for an answer with KLI>. Thus, during an actual dialog the format is:

```
KLI -- question [possible answers]?  
KLI>
```

If you give the default answer to each question (by pressing RETURN for the answer or typing the first choice), it is equivalent to taking the default path through KLINIT without entering the dialog.

NOTE

Do not type [and] around your answer.

Ques. 1 ENTER DIALOG [NO,YES,EXIT,BOOT]?

[NO] assumes the default answers for the remaining questions. This answer gives you a chance to bypass the dialog and take the default path.

[YES] continues the dialog.

[EXIT] discontinues the dialog and returns to the RSX-20F monitor. You can then type CTRL/\ (control backslash) to enter the PARSER (Appendix C).

[BOOT] immediately loads and starts BOOT, skips the rest of the dialog, and assumes NO to: RELOAD MICROCODE; RECONFIGURE CACHE; and CONFIGURE KL MEMORY.

Ques. 2 RELOAD MICROCODE [YES,VERIFY,NO]?

[YES] loads the microcode from the microcode file.

[VERIFY] verifies the microcode. This means verify the microcode with the microcode file.

[NO] neither loads nor verifies the microcode.

NOTE

The next two questions concern cache, which is available on the 2050 KL processor, but not the 2040. If your system does not have cache, these questions are not asked, and the dialog continues with question 5.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

Ques. 3 RECONFIGURE CACHE [FILE,ALL,YES,NO]?

[FILE] configures cache memory as specified in KL.CFG. If this file is on the bootstrap device, this answer is the default; if it is not on the device, ALL is assumed. The dialog continues with question 5.

[ALL] enables all cache memory. The dialog continues with question 5.

[YES] allows you to configure cache under dialog control.

[NO] does not reconfigure cache memory; the existing configuration remains unchanged. The dialog continues with question 5.

Ques. 4 ENABLE WHICH CACHES [ALL,NONE,0-3]?

[ALL] enables all cache memory.

[NONE] disables all cache memory.

[n,n,...] where n is 0, 1, 2, or 3 enables those caches whose numbers you specify.

Ques. 5 CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?

[FILE] configures KL memory as specified in KL.CFG. If this file is on the bootstrap device, this answer is the default; if it is not on the device, ALL is assumed. The dialog continues with question 8.

[ALL] configures KL memory with as much memory as possible and with the highest interleaving possible. The dialog continues with question 8.

[YES] prints a map of the physical memory configuration and allows you to configure memory under dialog control.

[NO] does not configure memory at all. This means the previous memory configuration remains. The dialog continues with question 8.

Ques. 6 CONTROLLER NUMBER [ALL,0-3,EXTERNAL]?

[ALL] uses all available controllers. The dialog continues with question 8.

[n,n,...] where n is 0, 1, 2, or 3, uses the controllers specified. All other controllers are set off-line. Note that all controller numbers entered are tested before they are used in the memory configuration.

[EXTERNAL] is currently not acceptable on a DECSYSTEM-20 and will cause an error message.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

Ques. 7 MEMORY MODULES [ALL, 0 - 7(per controller)]?

[ALL] uses all available storage modules.

[n,...;n,...;...] where n is 0-7, uses the storage modules listed. For example, if controllers 0 and 2 were specified in question 4, 0,1;0,1,2,3 means that modules 0 and 1 of controller 0 are used, and that modules 0,1,2, and 3 of controller 2 are used. Note that a module of MA20 memory is 16K and that a module of MB20 memory is 32K.

Ques. 8 LOAD KL BOOTSTRAP [YES,NO,filename]?

[YES] loads BOOT into KL memory. The BOOT program is read from the file BOOT.EXB on the bootstrap device. The dialog ends, skipping question 9, and passes control to BOOT.

[NO] does not load a KL bootstrap program into KL memory.

[filename] loads a bootstrap program from the filename specified. The filename is in the form XXXXXXXXXX.XXX. The XXXXXXXXXX represents one to nine alphanumeric characters; the XXX after "." represents three alphanumeric characters. EXB is the default file type if no file type is given, in that case, the "." is not necessary. The dialog ends, skipping question 9, and passes control to the bootstrap program.

NOTE

Once the bootstrap program is loaded, KLINIT checks if any cache was configured. If cache was not configured, KLINIT uses KL.CFG if it exists; otherwise, it configures all cache.

Once the bootstrap program is started, you get the BOOT> prompt from the bootstrap program. You can then type /D if you want to dump KL memory. You can then specify the TOPS-20 monitor to be loaded and started, or simply press RETURN to get the default monitor, PS:<SYSTEM>MONITR.EXE.

Ques. 9 EXIT [YES, RESTART]?

[YES] exits to the RSX-20F monitor. If any changes were made to the cache or memory configuration, KL.CFG is modified at this time.

[RESTART] restarts the dialog.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

B.2 KLINIT MESSAGES

KLINIT can output four types of messages: informational, warning, dialog error, and system error.

B.2.1 Informational Messages

Informational messages indicate the successful completion of a KLINIT function. These messages are preceded by "KLI --".

The informational messages are:

KLI -- ALL CACHES ENABLED

All four of the KL processor's caches have been enabled.

KLI -- BOOTSTRAP LOADED AND STARTED

A KL bootstrap program has been loaded into KL memory and started. Any messages following that message are a function of the particular bootstrap program being used.

KLI -- CACHES DISABLED

All cache memory has been disabled.

KLI -- CACHES n,n,... ENABLED

The specified caches have been enabled.

KLI -- CONFIGURATION FILE ALTERED

KL.CFG was updated for a new cache and/or memory configuration. This message is issued if you set up a nondefault configuration or if KL.CFG did not previously exist.

KLI -- KL RESTARTED

The KL processor has been restarted following a power failure.

KLI -- MICROCODE VERSION n LOADED

The KL microcode, version n, has been loaded into the KL system from the microcode file on the front-end bootstrap device.

KLI -- MICROCODE VERSION n VERIFIED

The KL microcode, version n, that was most recently loaded into the system has been compared correctly with the code in the microcode file on the front-end bootstrap device.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

B.2.2 Warning Messages

Warning messages inform you of some unusual condition. However, the KLINIT dialog continues. These messages are preceded by "KLI -- %".

The warning messages are:

KLI -- % INT. MEMORY HAS SOME 1-WAY INTERLEAVED

At least one pair of controllers has been configured with 1-way interleaving.

KLI -- % NO FILE - ALL CACHE BEING CONFIGURED

The default to the RECONFIGURE CACHE question was taken, but KLINIT could not find KL.CFG in the proper directory on the bootstrap device. Thus, KLINIT enables all caches.

KLI -- % NO FILE - ALL MEMORY BEING CONFIGURED

The default to the CONFIGURE KL MEMORY question was taken, but KLINIT could not find KL.CFG in the proper directory on the bootstrap device. Thus, KLINIT configures all available memory with the highest interleaving possible.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

B.2.3 Dialog Error Messages

Dialog error messages indicate that your answer to the current KLINIT question is unacceptable. Unless otherwise noted, KLINIT repeats the question, prompts again, and waits for an appropriate reply. These messages are preceded by "KLI -- ".

The dialog error messages are:

KLI -- COMMAND SYNTAX ERROR

Your reply was not one of the possible answers specified in the question.

OPERATOR ACTION:

Reply with one of the acceptable answers, correctly spelled, or press RETURN to take the default answer.

KLI -- NO EXTERNAL MEMORY AVAILABLE

You answered EXTERNAL, but there is no external memory on your system.

OPERATOR ACTION:

Reply with ALL or specific controller numbers.

KLI -- NONEXISTENT OR DUPLICATE CONTROLLER SPECIFIED

You specified a memory controller that does not exist on your system, or you specified the same controller number twice.

OPERATOR ACTION:

Check that you typed what you intended. Do not specify memory controllers that you do not have on your system. Also, eliminate duplicate numbers.

KLI -- NONEXISTENT OR DUPLICATE MODULE SPECIFIED

You specified a memory module that does not exist on the indicated controller, or you specified the same module number twice on the indicated controller.

OPERATOR ACTION:

Check that you typed what you intended and that you used the correct format. Do not specify modules that do not exist on a controller. Also, eliminate duplicate module numbers on the same controller.

KLI -- MODULES DO NOT MATCH CONTROLLERS SPECIFIED

You specified fewer or more module groups than controllers.

OPERATOR ACTION:

Check the format of your answer. Be sure to separate each module group with a semicolon. Specify a group of modules for each controller specified.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

B.2.4 System Error Messages

System error messages indicate conditions that prevent KLINIT from continuing. These conditions are caused by software, hardware, or environmental failures. Sometimes a retry will be successful; other times you may need the assistance of your field service representative or software contact. After any system error, save all console terminal output and memory dump listings; this material is of prime importance for those troubleshooting the problem.

System error messages are preceded by "KLI -- ? ". Unless noted otherwise, after all system error messages, the KLINIT dialog restarts.

Whenever a file is specified in a message, it has the format:

'device:filename.type;version'

The system messages are:

KLI -- ? BOOTSTRAP LOAD FAILED

A software or hardware error occurred while the KL bootstrap program was loading. (See accompanying messages for additional information.)

OPERATOR ACTION:

Reload the bootstrap program by replying:

KLI>BOOT

If the trouble persists, call your field service representative.

KLI -- ? C-RAM DIFFERS AT n

During microcode verification, the contents of octal location n in the KL processor did not match the corresponding microcode in the microcode file.

OPERATOR ACTION:

Reload the microcode and verify it again via the KLINIT dialog. If the trouble persists, call your field service representative.

KLI -- ? CACHE ENABLE FAILED

There probably was a hardware error while KLINIT was trying to configure cache memory. (See accompanying messages for additional information.)

OPERATOR ACTION:

Retry the operation. If the trouble persists, call your field service representative. You can also temporarily reconfigure with no cache memory.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

KLI -- ? CANNOT DETERMINE PHYSICAL CONFIGURATION

When configuring memory, KLINIT could not determine the physical configuration of the memory units. (See accompanying messages for additional information.)

OPERATOR ACTION:

Reload the system. If trouble persists, call your field service representative.

KLI -- ? CANNOT FIND [5,5] DIRECTORY

KLINIT could not locate the system file directory; a software error may have destroyed it. The system exits from KLINIT.

OPERATOR ACTION:

Reload the system. If the trouble persists, call your software contact.

KLI -- ? CANNOT FIND HALT LOOP

The microcode was not functioning correctly.

OPERATOR ACTION:

Reload the microcode. If the trouble persists, call your field service representative.

KLI -- ? CANNOT GET DEVICES

KLINIT could not open a system device for communications. This is probably caused by a software error in RSX-20F. The system exits from KLINIT.

OPERATOR ACTION:

Reload the system. If the trouble persists, call your software contact.

KLI -- ? CANNOT RUN KLINIT WHILE KL IS IN PRIMARY PROTOCOL

An attempt was made to run KLINIT while the KL processor was running. This can happen only if someone tries to run KLINIT via the PARSER's RUN command.

OPERATOR ACTION:

If the intent was to rerun KLINIT, follow the appropriate procedures to shut down TOPS-20. Then reload the system and enter KLINIT.

KLI -- ? CANNOT START KL

A hardware or software failure occurred during a restart from a power failure. (See accompanying messages for additional information.)

OPERATOR ACTION:

Reload the microcode and retry the operation. If the trouble persists, call your field service representative.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

KLI -- ? CONFIGURATION FILE NOT CHANGED

KL.CFG could not be updated. Perhaps the old file could not be read or the new file could not be written. (See accompanying messages for additional information.)

OPERATOR ACTION:

Call your system manager and your software contact.

KLI -- ? D-RAM DIFFERS AT n

During microcode verification, the contents of octal location n in the KL processor did not match the corresponding microcode in the microcode file.

OPERATOR ACTION:

Reload the microcode and verify it again via the KLINIT dialog. If the trouble persists, call your field service representative.

KLI -- ? DEPOSIT FAILED

KLINIT could not store information into KL memory.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your field service representative.

KLI -- ? DEVICE 'device' FULL

KLINIT could not find room to put an updated copy of KL.CFG on the bootstrap device.

OPERATOR ACTION:

Call your system manager and your software contact.

KLI -- ? DF EXECUTE FAILED

A diagnostic function execute failed while KLINIT was initializing the KL processor.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your field service representative.

KLI -- ? DF READ FAILED

A diagnostic function read failed while KLINIT was initializing the KL processor.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your field service representative.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

KLI -- ? DF WRITE FAILED

A diagnostic function write failed while KLINIT was initializing the KL processor.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your field service representative.

KLI -- ? DIRECTIVE ERROR -n ON FILE 'filename'

A system error occurred while KLINIT was trying to access the file 'filename.' The "n" is an octal error code for use by software support.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your software contact.

KLI -- ? EXAMINE FAILED

KLINIT could not examine KL memory.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your field service representative.

KLI -- ? FILE 'filename' NOT FOUND

KLINIT could not find the microcode file, the BOOT.EXB file, or the specified KL bootstrap file in the directory [5,5] on SY0:.

OPERATOR ACTION:

If you specified a file, be sure you typed it correctly. Retry the operation. If the trouble persists, call your software contact.

KLI -- ? FILE DOES NOT FIT PHYSICAL CONFIGURATION

KL.CFG specified a controller or module that was not available.

OPERATOR ACTION:

Reconfigure memory via the KLINIT dialog. Then retry the operation.

KLI -- ? I/O ERROR -n ON FILE 'filename'

An I/O error occurred while KLINIT was trying to access the file 'filename'. The "n" is an octal error code for use by software support.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your software contact.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

KLI -- ? INPUT RECORD LENGTH ERROR

An error occurred while KLINIT was trying to read the microcode file, the KL.CFG file, or the KL bootstrap file. This error could be caused by a software or hardware failure.

OPERATOR ACTION:

Call your software contact.

KLI -- ? INSUFFICIENT MEMORY FOR BOOTSTRAP

Insufficient memory was available when KLINIT was trying to load the bootstrap program. (See any accompanying messages for additional information.)

OPERATOR ACTION:

Reconfigure with more memory. If trouble persists, call your field service representative.

KLI -- ? MASTER RESET FAILED

A master reset function to the KL failed. There was a hardware error.

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your field service representative.

KLI -- ? MEMORY CONFIGURATION FAILED

A hardware or software error occurred while KLINIT was configuring memory. (See accompanying messages for additional information.)

OPERATOR ACTION:

Reload the system and retry the operation. If the trouble persists, call your field service representative.

KLI -- ? MICROCODE LOAD FAILED

A hardware or software error occurred while KLINIT was loading the microcode. (See accompanying messages for additional information.)

OPERATOR ACTION:

Retry loading the microcode. If the trouble persists, call your field service representative.

KLI -- ? MICROCODE VERIFY FAILED

Verification of the microcode discovered errors itemized in error messages previously output on the CTY.

OPERATOR ACTION:

Reload the microcode and verify it. If the trouble persists, call your field service representative.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

KLI -- ? NO MEMORY AT LOCATION ZERO

When KLINIT was configuring memory, it could not configure any memory to physical location zero.

OPERATOR ACTION:

Try reloading via the DISK or FLOPPY load switch. If trouble persists, call your field service representative.

KLI -- ? OUTPUT RECORD LENGTH ERROR

An error occurred while KLINIT was trying to update KL.CFG.

OPERATOR ACTION:

Retry the operation. If the problem persists, call your software contact.

KLI -- ? POWER-FAIL RESTART FAILED

KLINIT could not restart the KL processor during a power-fail recovery. (See accompanying message for additional information.)

OPERATOR ACTION:

Reload the system using one of the load switch procedures. If the system still does not come up, call your field service representative.

KLI -- ? READ ERROR

A hardware or software error occurred while KLINIT was accessing the microcode file, the KL.CFG file, or the KL bootstrap file. (See any accompanying messages for additional information.)

OPERATOR ACTION:

Retry the operation. If the trouble persists, call your software contact.

KLI -- ? WRITE ERROR

A hardware or software error occurred while KLINIT was updating KL.CFG. (See any accompanying messages for additional information.)

OPERATOR ACTION:

Retry the operation. If the trouble persists, call your software contact.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

B.3 REPORTS RELATING TO KL MEMORY CONFIGURATION

As soon as KLINIT configures KL memory, either by default or through the dialog, it prints on your console terminal a logical memory configuration map. For example,

```
LOGICAL MEMORY CONFIGURATION:
      CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 128K  00 01 00 01   MA20   4
00400000 128K  02 03 02 03   MA20   4
```

This map tells you how KL memory has been configured, where:

ADDRESS = KL memory address

SIZE = KL memory size in K

RQ0 = SBUS request bit 0

RQ1 = SBUS request bit 1

RQ2 = SBUS request bit 2

RQ3 = SBUS request bit 3

CONTYPE = memory controller type

INT = interleave mode

The preceding map indicates there is 256K of MA20 internal memory which has been 4-way interleaved. Memory controllers #0 and #2 respond to SBUS request bits 0 and 2, and memory controllers #1 and #3 respond to SBUS request bits 1 and 3.

You can use the logical memory configuration map to determine which memory module contains a given physical address, *y*. First, note that each line under the heading:

```
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
```

describes a contiguous block of memory specified by a starting address and a size. Then:

1. Determine which line describes the block of memory including *y*.
2. Let *n* be the value of the two least significant bits in *y*. Note which column is RQ_{*n*}.
3. There is a number at the intersection of the line identified in step 1 and the column identified in step 2. Note this number; it is the number of the controller containing the memory module that contains *y*.
4. Determine the number of the storage module that contains *y*. First, remember that the bits in address *y* are numbered from the right, in decreasing order, beginning with bit 35. Look at address *y* and determine the values of the bits in the bit positions specified in Table B-1 for your memory configuration. Those bits, interpreted as a 2-bit number, determine the module containing *y*. The module is on the controller identified in step 3.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

Table B-1
Memory Storage Module Determination

Controller Type	Interleave	Left Bit	Right Bit
MA20	1-way	20	21
	2-way	19	20
	4-way	19	34
MB20	1-way	19	20
	2-way	18	19
	4-way	18	34

If you attempt to configure memory yourself via the dialog, you will also get a physical memory configuration map printed after you answer YES to CONFIGURE KL MEMORY. For example,

PHYSICAL MEMORY:

```

CONTROLLER ADDRESS  TYPE  STORAGE
                    7 6 5 4 3 2 1 0
0                   MA20  0 0 0 0 1 1 1 1
1                   MA20  0 0 0 0 1 1 1 1
2                   MA20  0 0 0 0 1 1 1 1
3                   MA20  0 0 0 0 1 1 1 1
    
```

This map represents the physical memory allocation, where:

CONTROLLER ADDRESS = memory controller number

TYPE = memory type

STORAGE = memory storage module

The preceding map indicates there are four MA20 memory controllers, each with four 16K storage modules (indicated by 1's for storage modules 0 through 3). Storage modules 4 through 7 are not present, indicated by 0's. Storage modules 4 through 7 are physically impossible for MA20 or MB20 memory).

Some of the rules that the memory configuration algorithm follows are:

1. 2-way or 4-way interleaving can only be done between controllers 0 and 1 or between controllers 2 and 3.
2. To use any memory, module 0 of some controller must be available.

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

B.4 KLINIT DIALOG EXAMPLES

1. This example shows the output from your console terminal when you load the system using the DISK load switch. It automatically takes the default values of KLINIT without asking you any questions. However, it does tell you what version of KLINIT is running, what version of microcode has been loaded, and what caches have been enabled. It prints out the logical memory map. Then, it says that the KL bootstrap has been loaded and started. The bootstrap then loads and starts the TOPS-20 monitor.

RSX-20F YB10-07A 7:40 31-AUG-77

```
[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- MICROCODE VERSION 173 LOADED
KLI -- ALL CACHES ENABLED
LOGICAL MEMORY CONFIGURATION:
      CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 128K 00 01 00 01   MA20    4
KLI -- BOOTSTRAP LOADED AND STARTED
```

[PS MOUNTED]

2. This example shows the output from your console terminal when you load the system via the switch register with switches 0, 1, and 2 set. The dialog is entered only to load and start the KL bootstrap. This allows you to leave the microcode, cache configuration, and memory configuration as they were. Then after the prompt BOOT>, RETURN was pressed to indicate that the default monitor, PS:<SYSTEM>MONITR.EXE, should be loaded and started.

RSX-20F YB10-07A 7:40 31-AUG-77

```
[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>BOOT
KLI -- ALL CACHES ENABLED
KLI -- BOOTSTRAP LOADED AND STARTED
```

BOOT>

[PS MOUNTED]

3. This example shows the dialog being used to enable all caches and to reconfigure MA20 memory. Controllers 0 and 1 are specified with modules 0, 1, and 2 on each controller. KLINIT prints out both physical and logical memory maps, indicating that there is 96K of memory, 2-way interleaved. RETURN was pressed after BOOT> to load and start the default monitor.

RSX-20F YB10-07A 7:40 31-AUG-77

```
[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
```

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

```

KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>NO
KLI -- RECONFIGURE CACHE [FILE,ALL,YES,NO]?
KLI>ALL
KLI -- ALL CACHES ENABLED
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI>YES
PHYSICAL MEMORY:
CONTROLLER ADDRESS  TYPE      STORAGE
                   7 6 5 4 3 2 1 0
           0          MA20  0 0 0 0 1 1 1 1
           1          MA20  0 0 0 0 1 1 1 1
KLI -- CONTROLLER NUMBER [ALL,0 - 3,EXTERNAL]?
KLI>0,1
KLI -- MEMORY MODULE [ALL,0 - 7(PER CONTROLLER)]?
KLI>0,1,2;0,1,2
LOGICAL MEMORY CONFIGURATION:
                CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 96K  00 01 00 01  MA20  2
KLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
KLI>YES
KLI -- CONFIGURATION FILE ALTERED
KLI -- BOOTSTRAP LOADED AND STARTED

```

BOOT>

[PS MOUNTED]

4. This example shows the output from your console terminal after the system is loaded via the switch register with switches 0, 1, 2, and 7 set. It shows that the microcode was loaded; that caches 0, 1, and 2 were enabled; that MA20 memory was reconfigured using modules 1, 2, and 3 of controller 0 and all four modules of controller 1; and that VBORP4.EXB was chosen as the KL bootstrap. Because there was no module 0 of controller 0, 16K was designated as nonexistent memory, and 1-way interleaving was the maximum.

RSX-20F YB10-07A 7:40 31-AUG-77

```

[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>YES
KLI -- MICROCODE VERSION 173 LOADED
KLI -- RECONFIGURE CACHE [FILE,ALL,YES,NO]?
KLI>YES
KLI -- ENABLE WHICH CACHES [ALL,NONE,0-3]?
KLI>0,1,2
KLI -- CACHES 0,1,2 ENABLED
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI>YES
PHYSICAL MEMORY:
CONTROLLER ADDRESS  TYPE      STORAGE
                   7 6 5 4 3 2 1 0
           0          MA20  0 0 0 0 1 1 1 1
           1          MA20  0 0 0 0 1 1 1 1
KLI -- CONTROLLER NUMBER [ALL,0 - 3,EXTERNAL]?

```

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

```

KLI>0,1
KLI -- MEMORY MODULE [ALL,0 - 7(PER CONTROLLER)]?
KLI>1,2,3;0,1,2,3
LOGICAL MEMORY CONFIGURATION:
      CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 64K   01 01 01 01   MA20   1
00200000 16K   NONEXISTENT MEMORY
00240000 48K   00 00 00 00   MA20   1
KLI -- % INT. MEMORY HAS SOME 1-WAY INTERLEAVED
KLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
KLI>VBORP4
KLI -- CONFIGURATION FILE ALTERED
KLI -- BOOTSTRAP LOADED AND STARTED

```

BOOT>

5. This example shows that bootstrap file XXX.EXB was not found. Thus, after the fatal error messages, the dialog restarts.

RSX-20F YB10-07A 7:40 31-AUG-77

```

[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>NO
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI>NO
KLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
KLI>XXX
KLI -- ? FILE 'DX0:XXX.EXB;0' NOT FOUND
KLI -- ? BOOTSTRAP LOAD FAILED
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>

```

6. This example shows that KL memory could not be configured because of insufficient internal memory. The reason is there is no module 0 for either controller 0 or 1.

RSX-20F YB10-07A 7:40 31-AUG-77

```

[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>YES
KLI -- MICROCODE VERSION 173 LOADED
KLI -- RECONFIGURE CACHE [FILE,ALL,YES,NO]?
KLI>
KLI -- ALL CACHES ENABLED
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI>YES
PHYSICAL MEMORY:
CONTROLLER ADDRESS  TYPE      STORAGE
                   7 6 5 4 3 2 1 0
                   0      MA20    0 0 0 0 1 1 1 1
                   1      MA20    0 0 0 0 1 1 1 1
KLI -- CONTROLLER NUMBER [ALL,0 - 3,EXTERNAL]?
KLI>0,1

```

KL INITIALIZATION OPERATOR DIALOG (KLINIT)

```

KLI -- MEMORY MODULE [ALL,0 - 7(PER CONTROLLER)]?
KLI>1,2;2,3
KLI -- ? NO MEMORY AT LOCATION ZERO
KLI -- ? MEMORY CONFIGURATION FAILED
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>

```

7. This example shows the dialog first being used to verify the microcode. Then it shows the MA20 memory being configured via the dialog for 64K memory, which can only be 1-way interleaved in this case. Then, the filename for the KL bootstrap is specified as MTBOOT. Because the file type is .EXB by default, MTBOOT.EXB is used as the bootstrap. This bootstrap loads the monitor from the magnetic tape on unit 0.

RSX-20F YB10-07A 7:40 31-AUG-77

```

[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>VERIFY
KLI -- MICROCODE VERSION 173 VERIFIED
KLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
KLI>YES
PHYSICAL MEMORY:
CONTROLLER ADDRESS  TYPE      STORAGE
                   7 6 5 4 3 2 1 0
                   0      MA20  0 0 0 0 1 1 1 1
                   1      MA20  0 0 0 0 1 1 1 1
KLI -- CONTROLLER NUMBER [ALL,0 - 3,EXTERNAL]?
KLI>0,1
KLI -- MEMORY MODULE [ALL,0 - 7(PER CONTROLLER)]?
KLI>0;1,2,3

```

```

LOGICAL MEMORY CONFIGURATION:
                CONTROLLER
ADDRESS  SIZE  RQ0 RQ1 RQ2 RQ3  CONTYPE INT
00000000 16K   00  00  00  00   MA20   1
00040000 48K   01  01  01  01   MA20   1
KLI -- % INT. MEMORY HAS SOME 1-WAY INTERLEAVED
KLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
KLI>MTBOOT
KLI -- CONFIGURATION FILE ALTERED
KLI -- BOOTSTRAP LOADED AND STARTED

```

BOOT>MT:

8. This example shows that an error occurred in verifying the microcode. Because the dialog is restarted after a fatal error, the solution to try is to answer YES to the RELOAD MICROCODE question the next time.

RSX-20F YB10-07A 7:40 31-AUG-77

```

[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]
KLI -- VERSION YB05-03 RUNNING
KLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
KLI>YES
KLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
KLI>VERIFY

```

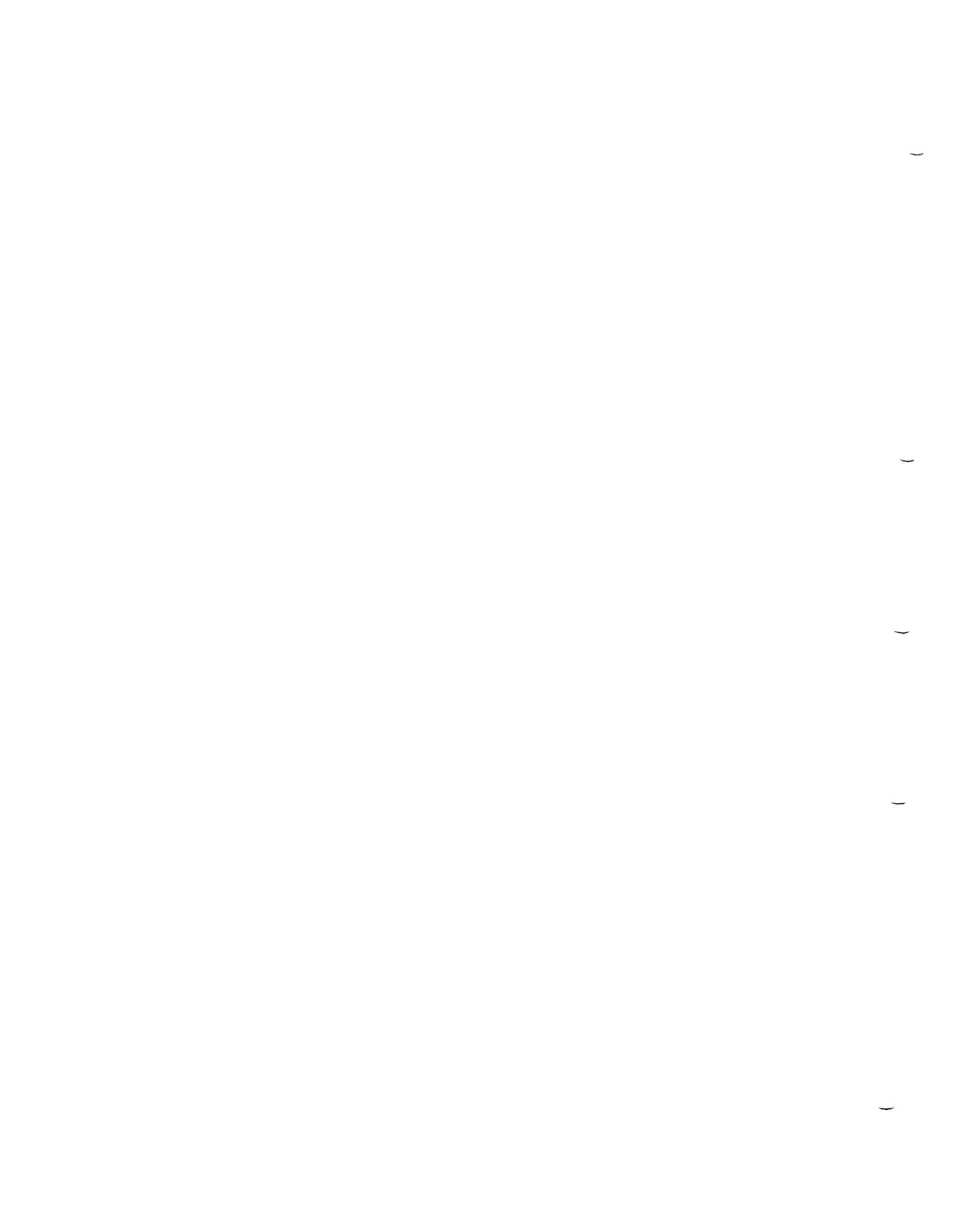
KL INITIALIZATION OPERATOR DIALOG (KLINIT)

```
CLI -- ? C-RAM DIFFERS AT 0
CLI -- ? MICROCODE VERIFY FAILED
CLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
CLI>
```

9. This example shows ESCAPE being used, after the question LOAD KL BOOTSTRAP, to restart the dialog. It also shows an unacceptable answer causing a question to be repeated, and CTRL/Z causing the dialog to exit. Then you can type CTRL/\ to enter the console processor command language (the PARSER).

RSX-20F YB10-07A 7:40 31-AUG-77

```
[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
CLI -- VERSION YB05-03 RUNNING
CLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
CLI>YES
CLI -- RELOAD MICROCODE [YES,VERIFY,NO]?
CLI>NO
CLI -- RECONFIGURE CACHE [FILE,ALL,YES,NO]?
CLI>NO
CLI -- CONFIGURE KL MEMORY [FILE,ALL,YES,NO]?
CLI>NO
CLI -- LOAD KL BOOTSTRAP [YES,NO,FILENAME]?
CLI>
CLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
CLI>NP
CLI -- COMMAND SYNTAX ERROR
CLI -- ENTER DIALOG [NO,YES,EXIT,BOOT]?
CLI>^Z
```



APPENDIX C

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

The console processor command language, PARSER, runs as a task under RSX-20F, the monitor for the console front-end processor. Its main function is to receive commands, usually from the CTY, and perform various console functions on the KL and console front-end processors.

Whenever you are communicating via the TOPS-20 monitor and want to use this command language, type CTRL/\ (control backslash) on the CTY. If you are communicating with a task under RSX-20F, for example KLINIT, you must exit from the task with CTRL/Z and then type CTRL/\. To leave the command language, type QUIT.

C.1 PARSER MESSAGES AND PROMPTS

Once you enter the console processor command language, you receive a prompt of PAR followed by one of the characters below.

- > to indicate that the KL is running a program
- % to indicate that the KL is not running a program, but the clock is on and examines are allowed
- # to indicate that the KL clock is off

You should never see PAR# during timesharing. If you do, reload the system.

If the PARSER encounters an error during initialization, an error message will precede the prompt.

C.2 PARSER CONSOLE MODES

There are four console modes that you can set for the console processor command language. These modes determine which commands are allowed. When maintenance console mode is set, all commands are allowed. When programmer console mode is set, all commands except diagnostic functions are allowed. When operator console mode is set, the PARSER accepts only those commands that will not crash TOPS-20. Lastly, when user console mode is set, the PARSER exits, and the console terminal can again be used to communicate with jobs via TOPS-20 commands. (See the SET CONSOLE command in Section C.3.)

When you enter the console processor command language, the default console mode is operator. And, as an operator, you should always leave the console mode set to operator.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

C.3 PARSER COMMANDS FOR THE OPERATOR

When you give commands to the console processor command language, you must type a command line in one of the following formats.

1. A single command followed by `RET`
2. Several commands separated by semicolons and ending with `RET`

If you need to continue a command line beyond a line (maximum of 280 characters), at the end of the line, type a hyphen, press RETURN, and begin the next line with a hyphen. The command line is complete when there is a `RET` that is not preceded by a hyphen.

After you press the final RETURN of the command line, the PARSER begins executing those commands in the command line. If the PARSER finds an illegal character (LINE FEED or ESCAPE) in the command line, no part of the command line is executed.

There is a help facility built into the PARSER. If you type ? and press RETURN after the prompt, the PARSER outputs on your console terminal the list of available commands.

----- Example -----

```
PAR>? RET
PARSER COMMANDS ARE:
ABORT
CLEAR
DISCONNECT
EXAMINE
JUMP
MCR
REPEAT
RUN
SET
SHUTDOWN
QUIT
WHAT
PAR>
```

You can also type ? and press RETURN for the argument in a command to see what is allowed. Note that you automatically return to PARSER command level and get the PARSER prompt. This means you must retype the entire command.

----- Example -----

```
PAR%EXAMINE ?
EXAMINE COMMANDS ARE:
PC
ELEVEN
KL
TEN
DECREMENT
INCREMENT
NEXT
PREVIOUS
THIS
PAR%
```

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

The following commands are a subset of the console processor command language. However, they are the commands relevant to your functions as an operator. Therefore, they can be done under operator console mode. (See SET CONSOLE below.)

ABORT

This command stops the KL. Use this only when the SHUTDOWN command fails to produce the message **HALTED**.

CLEAR CONSOLE

This command makes the console mode OPERATOR.

CLEAR KLINIK

This command closes the KLINIK access window, terminates an active KLINIK link, and clears all KLINIK parameters. (See the SET KLINIK command.) Because this command does not hang up the modem, the remote user does not have to redial to try to gain KLINIK access.

----- Example -----

```
PAR>CLEAR KLINIK
    KLINIK DISABLED
```

```
KLD -- KLINIK ACCESS TERMINATED BY OPERATOR
```

```
PAR>
```

DISCONNECT

This command terminates KLINIK access by hanging up the modem. It does not clear any KLINIK parameters.

----- Example -----

```
PAR>DISCONNECT
```

```
KLD -- KLINIK LINE DISCONNECTED
```

```
PAR>
```

EXAMINE PC

This command outputs on your terminal the KL's PC (program counter).

----- Example -----

```
PAR>EX PC
PC/ 422442
PAR>
```

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

EXAMINE KL

This command outputs on your terminal the KL's PC, the VMA (virtual memory address register), the state of the PI (priority interrupt) system, and the PC flags.

----- Example -----

```
PAR>EX KL
PC/ 422236
VMA/ 1 013606
PI ACTIVE: ON, PI ON: 177, PI HOLD: 000, PI GEN: 000
  OVF  CY0  CY1  FOV  BIS  USR  UIO  LIP  AFI  AT1  AT0  FUF  NDV
    X    X    X    X          X          X
PAR>
```

QUIT

This allows you to leave the console processor command language.

REPEAT n

This command takes a number n as an argument and causes the rest of the line to be executed that many times. It ignores any semicolons in the line. For example,

```
REPEAT 3;EXAM PC
```

would cause the PC to be examined three times.

SET CONSOLE mode

This command determines which set of front-end commands you can execute. If the mode is MAINTENANCE, you can execute all commands. If it is PROGRAMMER, you can execute all commands except diagnostic functions. If the mode is OPERATOR, you can only execute those commands which cannot crash the TOPS-20 monitor. Lastly, if the mode is USER, you leave the command parser and can then use the terminal as a TOPS-20 timesharing terminal (equivalent to a QUIT command).

As an operator you should use only8

```
SET CONSOLE USER
```

or

```
SET CONSOLE OPERATOR
```

----- Example -----

```
PAR>SET CONSOLE OPERATOR
CONSOLE MODE: OPERATOR
PAR>
```

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

SET KLINIK

This command enables the KLINIK link. This link allows:

1. A field service representative to diagnosis hardware malfunctions from a remote location
2. A software support specialist to help someone at your installation from a remote location
3. DIGITAL's Field Service Product Support group and software specialists to collect and analyze performance data from a remote location

After you type SET KLINIK, you must type some responses to set KLINIK parameters. The parameters are:

```
KLINIK MODE
PASSWORD
ACCESS WINDOW OPEN DATE
ACCESS WINDOW OPEN TIME
ACCESS WINDOW CLOSE DATE
ACCESS WINDOW CLOSE TIME
HIGHEST CONSOLE MODE
```

The modes available are REMOTE and USER. USER mode allows the KLINIK link to be used as a timesharing terminal. REMOTE allows the KLINIK LINK to be used as a remote CTY. In this mode all input to and output from both the CTY and remote CTY appears on both terminals. Input is taken from both terminals as though it was from one terminal. Therefore, a SYSTAT can be done by typing S at the CTY and Y at the remote CTY.

If you type REMOTE to KLINIK MODE, you must specify a password. The password must be one to six numeric or uppercase alphabetic characters with no trailing blanks. The password is output on the CTY as you type it. You must tell the remote KLINIK user this password to allow him to use the KLINIK link.

The access window that you must specify is the time during which a remote user can gain access to the KLINIK link. Once access is gained, this window has no affect on the duration of the link, i.e., it will not terminate the link when the access window closes.

The dates for the window must be specified in the form dd-mmm-yy, except you can use spaces instead of hyphens.

dd = day represented as a number

mmm = alphabetic representation of the month with at least as many characters needed to make the abbreviation unique

yy = the right two digits of the year or all four digits of the year

You can press RETURN to specify a default date. The default OPEN DATE is the current date. The default CLOSE DATE is OPEN DATE plus one day.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

SET KLINIK

This command enables the KLINIK link. This link allows:

1. A field service representative to diagnosis hardware malfunctions from a remote location
2. A software support specialist to help someone at your installation from a remote location
3. DIGITAL's Field Service Product Support group and software specialists to collect and analyze performance data from a remote location

After you type SET KLINIK, you must type some responses to set KLINIK parameters. The parameters are:

```
KLINIK MODE
PASSWORD
ACCESS WINDOW OPEN DATE
ACCESS WINDOW OPEN TIME
ACCESS WINDOW CLOSE DATE
ACCESS WINDOW CLOSE TIME
HIGHEST CONSOLE MODE
```

The modes available are REMOTE and USER. USER mode allows the KLINIK link to be used as a timesharing terminal. REMOTE allows the KLINIK LINK to be used as a remote CTY. In this mode all input to and output from both the CTY and remote CTY appears on both terminals. Input is taken from both terminals as though it was from one terminal. Therefore, a SYSTAT can be done by typing S at the CTY and Y#RET at the remote CTY.

If you type REMOTE to KLINIK MODE, you must specify a password. The password must be one to six numeric or uppercase alphabetic characters with no trailing blanks. The password is output on the CTY as you type it. You must tell the remote KLINIK user this password to allow him to use the KLINIK link.

The access window that you must specify is the time during which a remote user can gain access to the KLINIK link. Once access is gained, this window has no affect on the duration of the link, i.e., it will not terminate the link when the access window closes.

The dates for the window must be specified in the form dd-mmm-yy, except you can use spaces instead of hyphens.

dd = day represented as a number

mmm = alphabetic representation of the month with at least as many characters needed to make the abbreviation unique

yy = the right two digits of the year or all four digits of the year

You can press RETURN to specify a default date. The default OPEN DATE is the current date. The default CLOSE DATE is OPEN DATE plus one day.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

The times for the window must be specified as hhmm or hh:mm.

hh = hour, greater than or equal to 0, but less than 24

mm = minute, greater than or equal to 0, but less than 60

You can press RETURN to specify a default time. The default OPEN TIME is the current time. The default CLOSE TIME is OPEN TIME.

If you typed USER to KLINIK mode, the command is finished. If you typed REMOTE, you must respond to HIGHEST CONSOLE MODE.

The console modes are MAINTENANCE, PROGRAMMER, and OPERATOR, in order of highest to lowest capability. This specifies the highest PARSER console mode allowed while the KLINIK link is active. This means that SET CONSOLE cannot be used from either the CTY or the remote CTY to change the console mode to allow a higher capability.

After you have typed all the necessary responses, the PARSER outputs:

```
KLINIK INACTIVE
ACCESS WINDOW OPEN: date time
ACCESS WINDOW CLOSED: date time
KLINIK MODE: m
```

and if KLINIK MODE is REMOTE, it also outputs:

```
HIGHEST CONSOLE MODE: c

m = REMOTE or USER
c = MAINTENANCE, PROGRAMMER, or OPERATOR
```

This output reflects your responses in the SET KLINIK command.

----- Example -----

```
PAR>SET KLINIK
KLINIK MODE: USER
ACCESS WINDOW OPEN DATE: 17-SEP-77
ACCESS WINDOW OPEN TIME: 1200
ACCESS WINDOW CLOSE DATE:
ACCESS WINDOW CLOSE TIME: 1400
KLINIK INACTIVE
ACCESS WINDOW OPEN: 17-SEP-77 12:00
ACCESS WINDOW CLOSED: 18-SEP-77 14:00
KLINIK MODE: USER
PAR>
```

SHUTDOWN

This command stops the KL timesharing system in an orderly way so that no files are destroyed. Also, it does not cause a reload. To enter the PARSER again, you must type CTRL/\.

After ^ECEASE has done its job of logging out most jobs, use this command to stop the TOPS-20 monitor.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

WHAT CONSOLE

This command outputs the console mode that you are currently using.

----- Example -----

```
PAR>WHAT CONSOLE
  CONSOLE MODE:  PROGRAMMER
PAR>
```

WHAT KLINIK

This command outputs the state of KLINIK and any KLINIK parameters that have been set. The output is in the following form.

```
KLINIK state
ACCESS WINDOW OPEN: date time
ACCESS WINDOW CLOSED: date time
KLINIK MODE: m
HIGHEST CONSOLE MODE: c
```

state = DISABLED when no KLINIK parameters have been set or a previous KLINIK access window has passed

ACTIVE when the KLINIK link is in use

INACTIVE when KLINIK parameters have been set, but the KLINIK link is not in use

date = the date corresponding to responses given in the SET KLINIK command

time = the time corresponding to responses given in the SET KLINIK command

m = REMOTE or USER as set in the SET KLINIK command

c = MAINTENANCE, PROGRAMMER, or OPERATOR as set in the SET KLINIK command

If the state is DISABLED, only the first line is output. If the KLINIK mode is REMOTE, the last line is also output.

If the KLINIK link was active while the console front end was reloaded, but the KLINIK parameters could not be obtained, WHAT KLINIK always outputs:

```
KLINIK ACTIVE FROM REBOOT
KLINIK MODE: REMOTE
HIGHEST CONSOLE MODE: MAINTENANCE
```

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

C.4 PARSER ERROR MESSAGES

The following list contains error messages that may be output from the front-end console processor command language. The format of each message is:

```
PAR -- [command name] code - message
```

The command name is the name of the command which caused the error. This command name can be PARSER if you typed a string which causes an error in the command parser, rather than in a command. For example, if you type an invalid command, you will get

```
PAR -- [PARSER] NSK - NO SUCH KEYWORD "xxx"
```

where xxx is what you typed incorrectly.

The codes and messages are given below along with explanations.

CODE	MESSAGE AND EXPLANATION
AMB	AMBIGUOUS KEYWORD "xxx" where xxx is the incorrect keyword. The PARSER found more than one keyword matching the abbreviation you typed.
APE	KL APR ERROR The PARSER encountered a CPU error (nonexistent memory, parity error, etc.). Call your field service representative.
BAE	BURST ARGUMENT ERROR There was an internal programming failure. Notify your software contact.
CAE	KL CRAM ADDRESS ERROR There was an internal programming failure. Notify your software contact.
CBO	COMMAND BUFFER OVERFLOW You typed a line that was too long, more than 280 characters. Try again by splitting the line.
CES	CLOCK ERROR STOP - code ERROR STOP where code is either CRAM, DRAM, FM, or FS-STOP. This happens when the CPU encounters a fatal internal hardware error. Note the code received, and call your field service representative. Also try to reload the system via DISK or FLOPPY, or via the switch register, provided that you reload the microcode.
CFH	CAN'T FIND KL HALT LOOP The PARSER tried to halt the KL but failed. Notify your field service representative.
CLE	CONSOLE LIMIT EXCEEDED While the KLINIK link is active in remote mode, you are not allowed to set a console mode that is higher than the console mode specified in SET KLINIK.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

CNR COMMAND IS NOT REPEATABLE
 You tried to repeat a command that cannot be repeated.

CPE CAN'T PHASE EBOX
 There was a hardware error. Call your field service representative.

CSK CAN'T START KL
 The PARSER tried to start the KL and failed. Call your field service representative.

DBS DATE BEFORE SYSTEM DATE
 You specified a date that is prior to when RSX-20F was built. This is not allowed.

DBT DATE BEFORE TODAY
 In the SET KLINIK command, you specified an access window open or close date that is prior to the current date.

DCK DIVIDE CHECK
 There was an internal programming error. Call your software contact.

DMF DEPOSIT KL MEMORY FAILED
 There was an internal programming failure. RSX-20F didn't accept a deposit directive.

DNP DTE-20 IS NOT PRIVILEGED
 This is a fatal error. The DTE-20 mode switch is in the wrong position. Call your field service representative and/or your software contact.

DOR DAY OUT OF RANGE
 In a date, you specified a day that does not exist in the month you specified.

DSF DTE-20 STATUS FAILURE
 A read or write to one of the DTE status registers failed.

DTC DTE-20 CONFUSED - RUN AND HALT LOOP
 This is a fatal error. The run and halt loop flags were set simultaneously, an impossible situation. Call your field service representative.

ECT EBOX CLOCK TIMEOUT
 While the PARSER was doing an execute function, the KL failed to reenter the halt loop within the allotted time.

EMF EXAMINE KL MEMORY FAILED
 There was an internal programming failure. RSX-20F didn't accept an examine directive.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

- EOC** **END OF COMMAND REQUIRED**
- Retype the command and press RETURN at the end.
- EPE** **EBUS PARITY ERROR**
- This a fatal error. The PARSER encountered an EBUS parity error. Call your field service representative.
- ESD** **EBOX STOPPED - DEPOSIT**
- The PARSER executed a deposit directive and found that the KL clock was stopped.
- ESE** **EBOX STOPPED - EXAMINE**
- The PARSER executed an examine directive and found that the KL clock was stopped.
- FRF** **FUNCTION READ n FAILED**
- where n is the number of the function that was tried. This is a fatal error. Call your field service representative and your software contact. If the system crashes, try to reload it.
- FWF** **FUNCTION WRITE n FAILED**
- where n is the number of the function that was tried. This is a fatal error. Call your field service representative and your software contact. If the system crashes, try to reload it.
- FXF** **FUNCTION XCT n FAILED**
- where n is the number of the function that was tried. This is a fatal error. Call your field service representative and your software contact. If the system crashes, try to reload it.
- IFC** **ILLEGAL FUNCTION CODE**
- There was an internal programming error. The PARSER received an illegal function read, write, or execute. Call your software contact.
- ILC** **ILLEGAL CHARACTER "c"**
- where c is the character's printing equivalent, so control characters are preceded by an up-arrow (^). (Refer to Section C.3.)
- ILS** **ILLEGAL SEPARATOR CHARACTER "s"**
- where s is the illegal character. Refer to Section C.3. Note that a tab is converted to one space.
- IOC** **ILLEGAL KL OPCODE**
- The PARSER tried to execute a KL instruction with illegal format. Call your software contact.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

- IPC ILLEGAL PASSWORD CHARACTER "c"
In the SET KLINIK command, you typed a password containing "c", an illegal character. You must use numeric or uppercase alphabetic characters in the password.
- IPE INTERNAL PROGRAMMING ERROR
Call your software contact.
- IRC ILLEGAL REPEAT COUNT
You typed a zero or negative argument to the REPEAT command.
- ITN ILLEGAL TASK NAME
In a RUN or MCR command, you specified a task name in an illegal format.
- KCN KL CLOCK IS OFF
The clock was off and you tried to execute a command that requires the clock to be on.
- KLA KL ADDRESS ERROR
In an examine command, you specified a KL address that was out of range.
- KLR ILLEGAL WHILE KL RUNNING
You tried to execute a command that is illegal while the KL is running.
- KNC KL IS NOT CONTINUABLE
You tried to continue the KL from a noncontinuable state.
- KWE KLINIK WINDOW ERROR
In the SET KLINIK command, you specified a window open date and time that is later than the window close date and time.
- MRA MISSING REQUIRED ARGUMENT
You didn't specify all the necessary arguments for the command.
- NER NUMERIC EXPRESSION REQUIRED
You must give a numeric expression.
- NOR INPUT NUMBER OUT OF RANGE
You specified a number that was out of range.
- NPI NULL PASSWORD ILLEGAL
You must type one to six numeric or uppercase alphabetic characters for the password in the SET KLINIK command.
- NSK NO SUCH KEYWORD "xxx"
where xxx is what you typed incorrectly. (See Section C.3.)

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

NST NO SUCH TASK
You specified a nonexistent task to the MCR or RUN command.

OAI ODD ADDRESS ILLEGAL
You tried to examine an odd PDP-11 address.

OFC ODD FUNCTION CODE
There was an internal programming error. Call your software contact.

PTL PASSWORD TOO LONG
You specified a password with more than six characters in the SET KLINIK command.

RPM RIGHT PARENTHESIS MISSING
In a numeric expression, a right parenthesis is missing.

SCF SET CLOCK FAILED
The PARSER cannot validate the clock enable parameters it has just set. This is a hardware error; call your field service representative.

SKI SET KLINIK ILLEGAL WHILE KLINIK ACTIVE
You are not allowed to set new KLINIK parameters when they have been previously set and the access window has not closed. If you want to change the parameters, type CLEAR KLINIK first.

SPF SET PARITY FAILED
The PARSER cannot validate the parity stop parameters it has just set. This is a hardware error; call your field service representative.

SZI START AT ZERO ILLEGAL
The KL can't be started at location zero.

TAA TASK ALREADY ACTIVE
A RUN or MCR command was issued while another task was active.

TOR TIME OUT OF RANGE
You did not specify the time correctly.

UME UNMATCHED ERROR CODE - "xxx"
where xxx is the error code. There was an internal programming error. Notify your software contact.

UNL KL MICROCODE NOT LOADED
Reload the system via DISK or FLOPPY, or via the switch register, provided that you reload the microcode.

CONSOLE PROCESSOR COMMAND LANGUAGE (PARSER)

WRM COMMAND NOT AVAILABLE IN THIS CONSOLE MODE

Refer to Sections C.2 and C.3.

XTO KL EXECUTE TIMED OUT

While performing an execute function, the KL failed to reenter the halt loop within the allotted time.

YOR YEAR OUT OF RANGE

You did not specify the year correctly.

APPENDIX D
BUGCHKS AND BUGHLTS

BUGHLT AND BUGCHK NAMES AND DESCRIPTIONS

ABKSKD ADDRESS BREAK FROM SCHEDULER CONTEXT
ADDONF ADDOBJ-LLLKUP FAILED
APRN1 NXM DETECTED BY APR
APRN2 NXM DETECTED BY APR
ASAASG DSKASA - ASSIGNING ALREADY ASSIGNED DISK ADDRESS
ASGBAD DSKASA - ASSIGNING BAD DISK ADDRESS
ASGBPG INIBTB-FAILED TO ASSIGN BAD PAGE(S)
ASGREP ILLEGAL PRIORITY GIVEN TO ASGRES
ASGREQ ILLEGAL POOL NUMBER GIVEN TO ASGRES
ASGSW2 SWPOMG-CAN'T ASSIGN RESERVED DRUM ADDRESS
ASGSWB SWPINI-CAN'T ASSIGN BAD ADDRESS
ASOFNF DELFIL: ASOFN GAVE FAIL RETURN FOR LONG FILE XB
ASTJFN GETFDB: CALLED FOR JFN WITH OUTPUT STARS
BADBAK FILIN2 - BACKUP COPY OF ROOT DIRECTORY IS NOT GOOD
BADBAT BAT BLOCKS UNREADABLE
BADBTB NIC- ILLEGAL REFERENCE TO BIT TABLE
BADDAC INSACT - NULL ACCOUNT STRING SEEN
BADDIS TAPE: INCONSISTENT STATE CODE
BADIDX IDXINI: PARTIALLY UNSUCCESSFUL INDEX TABLE REBUILD
BADREC FILINI - Reconstruction of ROOT-DIRECTORY failed
BADROT FILIN2: ROOT-DIRECTORY IS INVALID
BADTAB VERACT - SPURIOUS HASH TABLE ENCOUNTERED
BADTTY TRANSFER TO NONEXISTENT TTY CODE
BADTYP BAD LABEL FIELD DESC
BADXT1 INDEX TABLE MISSING AND CAN NOT BE CREATED
BADXT2 INDEX TABLE MISSING AND WAS CREATED
BADXTB FILIN2: Could not initialize index table
BKUPDF BKUPD - BAD CST1 ENTRY OR INCONSISTENT CST
BLKF1 BYTINA: BLKF SET BEFORE CALLING SERVICE ROUTINE
BLKF2 BYTOUA: BLKF SET BEFORE CALL TO SERVICE ROUTINE
BLKF3 CLZDO: BLKF SET BEFORE CALL TO SERVICE ROUTINE
BLKF4 .GDSTS: BLKF SET BEFORE CALL TO DEVICE ROUTINE
BLKF5 .MTOPR: BLKF SET BEFORE CALL TO DEVICE ROUTINE
BLKF6 .SDSTS: BLKF SET BEFORE CALL TO DEVICE ROUTINE
BOOTCR GETSWM - NOT ENOUGH CORE FOR SWPMON
BOOTEP GSMDSK - CANNOT MAP EPT PAGE
BOOTER GETSWM - ERROR LOADING SWPMON
BOOTLK GSMDSK - FAILED TO LOCK NEEDED PAGES
BOOTMP GSMDSK - CANNOT MAP BOOTSTRAP PAGES
BTBCR1 FILINI - NO BIT TABLE FILE AND UNABLE TO CREATE ONE
BTBCRT FILINI - COULD NOT INITIALIZE BIT TABLE FOR PUBLIC STRUCTURE
CKDFRK JOB 0 CFORK FAILED
CKLBLK CKLERR: CLOSE AND ABORT BLOCKED
CLZABF CLZFFW: SERVICE ROUTINE BLOCKED ON AN ABORT CLOSE
CLZDIN NETCLZ-COULD NOT SEND DI
CPYUF1 CACCT: IMPOSSIBLE FAILURE OF CPYFUL.
CRDBAK CRDIR3: COULD NOT MAKE BACKUP COPY OF ROOT-DIRECTORY

BUGCHKS AND BUGHLTS

CRDBK1 CRDIR4:COULD NOT MAKE BACKUP COPY OF ROOT-DIRECTORY
 CRDNOM CRDIR-FAILED TO MAKE MAIL.TXT FILE
 CRDOLD CRGDGB: OLD FORMAT CRDIR IS ILLEGAL
 CRDSDF CRDIR1: SETDIR FAILED ON NEW DIRECTORY
 CRSPAG VERACT - ACCOUNT DATA BLOCK CROSSES A PAGE BOUNDARY
 CST2I1 PAGE TABLE CORE POINTER AND CST2 FAIL TO CORRESPOND
 CST2I2 MVPT-CST2 INCONSISTENT
 CST2I3 PAGE TABLE CORE POINTER AND CST2 FAIL TO CORRESPOND
 DEABAD DSKDEA - DEASSIGNING BAD DISK ADDRESS
 DEAUNA DEDSK-DEASSIGNING UNASSIGNED DISK ADDRESS
 DELBDD DELDIR: BAD DIRECTORY DELETED. REBUILD BIT TABLE
 DELNDF DELNOD-LLLKUP FAILED
 DEQMDF DEQUE: INTERNAL MONITOR DEQ FAILED
 DEVUCF DEVAV - UNEXPECTED CHKDES FAILURE
 DGUTPG DIAG - LOCKED PAGE LIST PAGE LOCKED AT DIAG UNLOCK
 DGZTPA DIAG - LOCKED PAGE LIST PAGE WAS ZERO
 DIRACT ACTBAD: ILLEGAL FORMAT FOR DIRECTORY ACCOUNT BLOCK IN DIRECTORY:
 DIRB2L RLDFB2: DIRECTORY FREE BLOCK TOO LARGE IN DIRECTORY:
 DIRB2S RLDFB1: DIRECTORY FREE BLOCK TOO SMALL IN DIRECTORY:
 DIRBAD SETDI4: SMASHED DIRECTORY NUMBER:
 DIRBAF RLDFB5: BLOCK ALREADY ON DIRECTORY FREE LIST IN DIRECTORY:
 DIRBCB RLDFB3: DIRECTORY FREE BLOCK CROSSES PAGE BOUNDARY IN DIRECTORY:
 DIRBLK BLKSN: ILLEGAL BLOCK TYPE IN DIRECTORY:
 DIRDNL ULKDIR-DIRECTORY NOT LOCKED, DIRECTORY NUMBER:
 DIREXT EXTBAD: ILLEGAL FORMAT FOR DIRECTORY EXTENSION BLOCK IN DIRECTORY:
 DIRFDB ILLEGAL FORMAT FOR FDB IN DIRECTORY:
 DIRFKP SETDIR-DIR PAGE 0 BELONGS TO FORK IN DIRECTORY:
 DIRFRE FREBAD: ILLEGAL FORMAT FOR DIRECTORY FREE BLOCK IN DIRECTORY:
 DIRIFB RLDFB4: ILLEGAL BLOCK TYPE ON DIRECTORY FREE LIST IN DIRECTORY:
 DIRNAM NAMBAD: ILLEGAL FORMAT FOR DIRECTORY NAME BLOCK IN DIRECTORY:
 DIRPG0 DR0CHK: ILLEGAL FORMAT FOR DIRECTORY PAGE 0 IN DIRECTORY:
 DIRPG1 DRHCHK: DIRECTORY HEADER BLOCK IS BAD IN DIRECTORY:
 DIRRHB RLDFB6: ATTEMPTING TO RETURN A HEADER BLOCK IN DIRECTORY:
 DIRSY1 DELDL8: DIRECTORY SYMBOL TABLE FOULED UP FOR DIRECTORY:
 DIRSY2 MDDNAM: SYMBOL TABLE FOULED UP IN DIRECTORY:
 DIRSY3 LOOKUP: SYMBOL SEARCH FOULED UP IN DIRECTORY:
 DIRSY4 NAMCM4: DIRECTORY SYMBOL TABLE FOULED UP IN DIRECTORY:
 DIRSY5 SYMBAD: ILLEGAL FORMAT FOR DIRECTORY SYMBOL TABLE IN DIRECTORY:
 DIRSY6 RBLDST: PREMATURELY RAN OUT OF ROOM IN SYMBOL TABLE IN DIRECTORY:
 DIRULK ULKMD2: ATTEMPT TO UNLOCK ILLEGALLY FORMATTED DIR, DIR NUMBER:
 DIRUNS UNSBAD: ILLEGAL FORMAT FOR DIRECTORY USER NAME BLOCK IN DIRECTORY:
 DLDEF LOGICAL NAME DEFINE FAILED FOR FE CTY
 DMPRLF DMPREL-FAILED TO RELEASE PAGE
 DN20ST DTESRV- DN20 STOPPED
 DRMFUL DRUM COMPLETELY FULL
 DRMIBT DRMASN-BIT TABLE INCONSISTENT
 DRMNFR DRMAM-CAN'T FIND PAGE WHEN DRMFRE NON-0
 DSKBT1 DSK BIT TABLE FOULED, CAN'T FIND FREE PAGE ON TRACK WITH NON-0 COUNT
 DSKBT3 DISK BIT TABLE ALREADY LOCKED AT LCKBTB
 DST2SM SWPINI-DST TOO SMALL
 DTECAR DTESRV- CARRIER FUNCTION WITH NO LINE NUMBER PRESENT
 DTECDM DTESRV- TO -10 COUNTS DON'T MATCH
 DTEDAT TAKTOD- ILLEGAL FORMAT FOR TIME/DATE
 DTEDEV LINEAL -ILLEGAL DEVICE
 DTEDIN DTESRV- TO -10 IN PROGRESS ON DOORBELL
 DTEDEME DTESRV- ZERO Q COUNT
 DTEERR DTESRV-DTE DEVICE ERROR
 DTEIDP DTESRV- INDIRECT POINTER WITH GARBAGE PACKET
 DTEIFR DTESRV-ILLEGAL FUNCTION REQUEST FROM 11
 DTELPI DTECHK- DTE LOST PI ASSIGNMENT
 DTEMCC DOFRGM-MCB DISAGREES WITH COUNT
 DTEODD TAKLC-ODD BYTE COUNT FOR LINE CHARACTERS
 DTEP2S TOL0DN-PACKET TOO SMALL
 DTEPNR DTESRV- INCORRECT INDIRECT SETUP

BUGCHKS AND BUGHLTS

DTETIP DTETDN-TO10 DONE RECEIVED WITH NO TRANSFER IN PROGRESS
 DTETTY TAKLC-NON-TTY DEVICE ON FUNCTION CODE 4
 DTEUIF DTESRV-UNIMPLEMENTED FUNCTION FROM 11
 DVCHR DVCHR1 - UNEXPECTED CHKDES FAILURE WITHIN .DVCHR
 EFACF1 EFACF: CLOSF FAILED TO CLOSE FACT FILE.
 EFACF3 EFACF: FAILED TO WRITE INTO FACT FILE
 ENQMLF ENQUE: INTERNAL ENQ OF A MONITOR LOCK FAILED
 EXPAFK EXPALL: JOB 0 CFORK FAILED
 EXPRCD EXPALL: RCDIR FAILURE
 FATAPE FATAL ADDRESS PARITY ERROR
 FATCDP FATAL CACHE DIRECTORY PARITY ERROR
 FATMPE FATAL PARITY ERROR
 FEBAD FEHSD-WRONG FE
 FEBFOV FEHSD-BUFFER OVERFLOW
 FEOCPB FEFSYS - FAILED TO BACKUP ROOT-DIRECTORY
 FEUSTS FESSTS-UNKNOWN STATUS
 FILBAK FILCRD: COULD NOT CREATE BACKUP OF ROOT-DIR
 FILBOT COULD NOT CREATE BOOTSTRAP.BIN FILE
 FILBTB UNABLE TO WRITE BIT TABLE FILE
 FILCCD Could not create directory
 FILFEF Could not create Front End File System
 FILHOM UNABLE TO REWRITE HOME BLOCKS IN WRBTB
 FILIRD FILINW: COULD NOT INITIALIZE THE ROOT DIRECTORY
 FILJBI FILCRD: No room to create standard system directories
 FILMAP FILIN2: COULD NOT MAP IN ROOT-DIRECTORY
 FILRID FILINW: INDEX TABLE ALREADY SET UP FOR ROOT DIR
 FIXBAD Could not re-write Home Blocks to point to FE Filesystem
 FIXBDB COULD NOT RE-WRITE HOME BLOCKS TO POINT TO BOOTSTRAP.BIN
 FKWSP1 LOADBS-UNREASONABLE FKWSP
 FLKNS FUNLK-LOCK NOT SET
 FLKTIM FLOCK-TIMEOUT
 FRKBAL AGESET-FORK NOT IN BALSET
 FRKNDL FORK NOT PROPERLY DELETED
 FRKNPT FKHTN - FORK HAS NO PAGE TABLE
 FRKPT BADCPG-FATAL ERROR IN FORK PT PAGE
 FRKSLF SUSFK - GIVEN SELF AS ARG
 GLFNF GLREM - FORK NOT FOUND
 GTFDB1 DSKINS: GETFDB FAILURE.
 GTFDB2 NEWLFP: GETFDB FAILURE FOR OPEN FILE.
 GTFDB3 DSKREN-GETFDB FAILURE FOR OPEN FILE
 GTFDB6 CRDIOA: CANNOT DO GETFDB ON ROOT-DIRECTORY
 HARDCE HARD CACHE ERRORS--CACHE DESELECTED
 HSHERR VERACT - HASH VALUE OUT OF RANGE
 HSYFRK HSYS-JOB 0 CFORK FAILED
 IBCPYW COPY-WRITE POINTER IN INDEX BLOCK
 IBOFNF FILINI: ASOFN FAILURE FOR ROOT DIRECTORY IB
 IDFOD1 AT MENTR - INTDF OVERLY DECREMENTED
 IDFOD2 AT MRETN - INTDF OVERLY DECREMENTED
 IDXNOS FILINI - COULD NOT ASSIGN FREE SPACE FOR IDXTAB
 ILAGE BAD AGE FIELD IN CST0
 ILBOOT GETSWM-ILLEGAL VALUE OF BOOTFL
 ILCHS1 PHYSIO - ILLEGAL CHANNEL STATUS AT SIO
 ILCHS2 PHYSIO - ILLEGAL CHANNEL STATE AT STKIO
 ILCNSP PHYSIO - ILLEGAL CALL TO CONSPW
 ILCNST PHYSIO - ILLEGAL CALL TO CONSTW
 ILCST1 ILLEGAL ADDRESS IN CST1 ENTRY, CAN'T RESTART
 ILDEST ILLEGAL DESTINATION IDENTIFIER TO SETMPG OR SETPT
 ILDRA1 DASDRM-ILLEGAL OR UNASSIGNED DRUM ADDRESS
 ILDRA2 DRMIAD-ILLEGAL DRUM ADDRESS
 ILFPTE ILLFPT: ILLEGAL SECTION NUMBER REFERENCED
 ILGDA1 GDSTX - BAD ADDRESS
 ILGDA2 GDSTX - BAD ADDRESS
 ILIBPT BAD POINTER TYPE IN INDEX BLOCK
 ILIRBL PHYSIO - IORB LINK NOT NULL AT ONFPWQ

BUGCHKS AND BUGHLTS

ILJRFN JFKRFH - BAD JRFN, IGNORED
 ILLDMS BADDMS: ILLEGAL DMS JSYS FROM MONITOR CONTEXT
 ILLIND ILLEGAL INDIRECT
 ILLSTR NSPTSK-ILLEGAL INIT MESSAGE
 ILLTAB TABLK2: TABLE NOT IN PROPER FORMAT
 ILLUUO KIBADU: ILLEGAL UO FROM MONITOR CONTEXT
 ILMADR ILLEGAL ADDRESS REFERENCE IN MONITOR
 ILOFN1 MSCANP-ILLEG IDENT
 ILOKSK OKSKED WHEN NOT NOSKED
 ILPAG1 SWPOT0-INVALID PAGE
 ILPAGN MRKMPG-INVALID PAGE NUMBER
 ILPDAR PHYSIO - ILLEGAL DISK ADDRESS IN PAGEM REQUEST
 ILPID1 CREPID: ATTEMPT TO CREATE ILLEGAL PID
 ILPID2 DELPID: VALIDATED PID TURNED ILLEGAL
 ILPLK1 MLKPG-ILLEGAL ARGS
 ILPPT1 UPDOFN-BAD POINTER IN PAGE TABLE
 ILPPT2 UPDPGS-BAD POINTER IN PAGE TABLE
 ILPPT3 BAD POINTER IN PAGE TABLE
 ILPSEC ILLEGAL SECTION NUMBER
 ILPTN1 MRPACS-ILLEG PTN
 ILRBLT PHYSIO - IORB LINK NOT NULL AT ONF/STWQ
 ILRFPD PDL-OV IN ILLEGAL PAGE REFERENCE
 ILSPTH SETPT-SPTH INCONSISTENT WITH XB
 ILSPT1 ILLEGAL SPT INDEX GIVEN TO SETMXB
 ILSRC ILLEGAL SOURCE IDENTIFIER GIVEN TO SETPT
 ILSTP3 VERLUK: IMPOSSIBLE SKIP RETURN FROM EXTLUU
 ILSWPA SWPIN - ILLEGAL SWAP ADDRESS
 ILTWQ PHYINT - TWQ OR PWQ INCORRECT
 ILTWQP PHYSIO - PWQ OR TWQ TAIL POINTER INCORRECT
 ILULK1 MULKPG - TRIED TO UNLOCK PAGE NOT LOCKED
 ILULK2 TRIED TO UNLOCK PAGE NOT LOCKED
 ILULK3 MULKMP - ILLEGAL MONITOR ADDRESS
 ILULK4 MULKCR - ILLEGAL CORE PAGE NUMBER
 ILUST1 PHYSIO - UNIT STATUS INCONSISTENT AT SIO
 ILUST2 PHYSIO - UNIT STATUS INCONSISTENT AT SPS
 ILUST3 PHYSIO - SCHSEK - IMPOSSIBLE UNIT STATUS
 ILUST4 PHYSIO - CONTROLLER ACTIVE AT SPS
 ILUST5 PHYSIO - ILLEGAL UNIT OR CHANNEL STATE AT STKIO
 ILWRT2 ATTEMPTED WRITE REF TO PROTECTED MONITOR
 ILXBP SETPT-BAD POINTER IN XB
 IMINX1 UNUSUAL ANI INTERRUPT, CONI ANI IS
 IMINX2 IMIERR CALLED, CONI ANI IS
 IMPABF ASNTBF FAILED
 IMPAFB IMPCQ: ATTEMPT TO UNLOCK BUFFER ON FREELIST
 IMPALF IMPLKB: ATTEMPT TO LOCK BUFFER ON FREELIST
 IMPAUF IMPEIN: BUFFER ON FREELIST USED FOR INPUT
 IMPBSC MESSAGE HAS BAD SIZE OR COUNT
 IMPCCF CAN'T CREATE IMP FORK
 IMPCTH IMPNCL TOO HIGH
 IMPCUL RECD CTL MSG FOR UNKNOWN LINK
 IMPHIF HSTINI FAILED TO FIND HOST NAME FILE
 IMPHNW LHOSTN DISAGREES WITH THE IMP
 IMPIFC ILL FMT CTL MSG
 IMPIFH IMPGC-IMPOSSIBLE FAILURE OF IMPHFL
 IMPLAE IMPOPL: LINK ALREADY EXISTS
 IMPLEO CAN'T FIND LT ENTRY FOR OUTPUT MESSAGE
 IMPLTF IMPLT FULL
 IMPMSL PKMSG - MSG TOO LARGE
 IMPMSO MESSAGE STUCK IN OUTPUT QUEUE
 IMPMUL RECEIVED MSG FOR UNKNOWN LINK
 IMPNBC PKMSG: NEGATIVE RESIDUAL BYTE COUNT
 IMPNEA NVT RECEIVED BYTES EXCEEDING ALLOCATION
 IMPNII NO IMP INPUT BUFFERS
 IMPNMA PKBY1: NO MSG ALLOCATION

BUGCHKS AND BUGHLTS

IMPOFL MESSAGE BUFFER OVERFLOW
 IMPREA RECD EXCESS ALL
 IMPREM UPBRB: RECEIVED EXCESSIVE MESSAGES
 IMPRMI IMP - REGULAR MESSAGE ON IRREG QUEUE
 IMPRNE RECD NCP ERR
 IMPRNO RFRM OVERDUE
 IMPTMB NVTXG1: TOO MANY BREAKS OUTSTANDING
 IMPUBF IMULKB: ATTEMPT TO UNLOCK BUFFER ON FREELIST
 IMPUFB IMIPL: ATTEMPT TO UNLOCK BUFFER ON FREELIST
 IMPUO IMPOSSIBLE MUO
 IMPUXO IMP JB0 FORK - UNEXPECTED INTERRUPT
 IMPXBO IRREG MSG BUFFER OVERFLOW
 IMPXUT RECEIVED IRREG MSG WITH UNKNOWN LINK OR TYPE
 INDCNT DTESRV- BAD INDIRECT COUNT
 INVDTE DTEQ- INVALID DTE SPECIFIED
 IOPGF IO PAGE FAIL
 IPCFKH CHKPDD: COULD NOT FIND LOCAL FORK HANDLE
 IPCFRK PIDINB: CANNOT CREATE FORKS FOR IPCF
 IPCJB0 PIDINI: NOT IN CONTEXT OF JOB 0
 IPCMCN MESREC: MESSAGE COUNT WENT NEGATIVE
 IPCOVL PIDINI: PIDS AND FREE POOL OVERLAP, IPCF WON'T WORK!
 IPCSOD GETMES: SENDER'S COUNT OVERLY DECREMENTED
 JONRUN JOB 0 NOT RUN FOR TOO LONG, PROBABLE SWAPPING HANGUP
 JSBNIC SETPPG-JSB NOT IN CORE
 JTENQE JTENQ WITH BAD NSKED
 KLIOVF DTESRV-KLINIK DATA BASE TOO LARGE
 KPALVH KEEP ALIVE CEASED
 LCKDIR ATTEMPT TO LOCK DIRECTORY TWICE FOR SAME FORK
 LNGDIR LONG DIRECTORY FILE IN DIRECTORY:
 LNMILI LNMLUK: ILLEGAL VALUE OF LOGICAL NAME TABLE INDEX
 LUUMON .LBCBK: ILLEGAL LUO FROM MONITOR CONTEXT
 MAP41F MAPF41 FAILED TO SKIP
 MAPBT1 OFN FOR BIT TABLE IS ZERO
 MDDJFN GETFDB: CALLED FOR NON-MDD DEVICE
 MNTLNG MNTBTB - BIT TABLE IS A LONG FILE
 MONPDL OVERFLOW OR PDL OVERFLOW TRAP IN MONITOR
 MPEDEV MEMORY PARITY ERROR DETECTED BY APR OR DEVICE
 MPEUTP PFCDPE-UNKNOWN TRAP ON TEST REFERENCE
 MPIDXO MAPIDX - No OFN for Index Table File
 MTANOA IRBDN2: IRBDON CALLED FOR AN ACTIVE IORB
 MTANOI GETUBF: NO QUEUED IORB'S FOR INPUT
 MTANOQ IRBDN1: IRBDON CALLED FOR NON-QUEUED UP IORB
 MTAORN MTDIR0: MAGTAPE IORB OVERRUN
 MTARIN MTAINT: INTERRUPT RECEIVED FOR NONACTIVE IORB
 MTFCNX MTLFCN: FUNCTION CODE TOO LARGE
 NCPFUN NCP FSM RECIEVED FUNNY INPUT
 NETBAF RLNTBF: ATTEMPT TO RELEASE BUFFER ALREADY ON FREE LIST
 NETBAU ASNTBF: ATTEMPT TO ASSIGN A BUFFER ALREADY IN USE
 NETDET NVTDET: COULD NOT CLOSE NVT
 NETIEF NETOPN: EXTDEC FAILURE AFTER PREVIOUS NON-FAILURE.
 NETNNI NETINI: NNTBFS NOT INTEGRAL MULTIPLE OF MAXWPM
 NETRBG RLNTBF: ATTEMPT TO RELEASE BUFFER AT GARBAGE LOCATION
 NETRBL ASNTBF: REQUEST FOR BUFFER LARGER THAN MAXWPM
 NETWNS WATNOT: WAS CALLED FROM SCHEDULER LEVEL.
 NEWBAK FILRFS - NEWIB FAILURE FOR BACKUP ROOT-DIR
 NEWROT FILRFS - NEWIB FAILURE FOR ROOT-DIRECTORY
 NOACB MENTR - NO MORE AC BLOCKS
 NOADXB RELOFN-NO DSK ADR FOR XB
 NOALCM ALCMES: CANNOT SEND MESSAGE TO ALLOCATOR
 NOBAT1 FAILED TO WRITE PRIMARY BAT BLOCK
 NOBAT2 FAILED TO WRITE SECONDARY BAT BLOCK
 NOBTB FILINI - UNABLE TO OPEN BIT TABLE FILE
 NOBTBN FILINI - UNABLE TO GET SIZE OF BOOTSTRAP.BIN FILE
 NOCTY UNABLE TO ALLOCATE DATA FOR CTY

BUGCHKS AND BUGLTS

NODIR1	SPLMES: DIRST FAILED ON EXISTING DIRECTORY NAME
NOFEFS	FILINI - UNABLE TO GET SIZE OF FRONT END FILE SYSTEM
NOFNDU	FNDUNT-CAN'T FIND DEVICE FOR JFN
NOFRSP	ttspst- COULD NOT GET A FREE BLOCK
NOINTC	NSPSTK-ADJACENT NODE NOT INTERCEPT
NOINTR	ITRAP AND PREVIOUS CONTEXT WAS NOINT
NOIORB	SETIRB - MISSING IORB
NOLEN	UPDLEN: NO LENGTH INFO FOR OFN
NOMHDR	ILLEGAL MESSAGE WITH NO HEADER
NOPGT0	OPNLNG: NO PAGE TABLE 0 IN LONG FILE.
NOPID	PIDKFL: PID DISAPPEARED
NORSXF	PGMSRV- ILLEGAL PROTOCOL VERSION
NOSEB2	PGMPE-NO SYSERR BUFFER AVAILABLE
NOSERF	CAN'T GTJFN ERROR REPORT FILE
NOSKTR	ITRAP FROM NOSKED CONTEXT
NOSLNM	SLNINI: CANNOT CREATE SYSTEM LOGICAL NAME
NOSPLM	RELJFN: COULD NOT SEND SPOOL MESSAGE TO QUASAR
NOTOFN	UPDOF0-ARG NOT OFN
NOUTF1	SPLOPN: NOUT OF DIRECTORY NUMBER FAILED
NOUTF2	SPLMES: NOUT OF GENERATION NUMBER FAILED
NPWQPD	PHYSIO - NULL PWQ AT POSITION DONE
NRFTCL	PHYSIO - NO REQUESTS FOUND FOR CYLINDER SEEKED
NSKDIS	DISMISS WHILE NOSKED OR WITH NON-RES TEST ADDRESS
NSKDT2	PGRTRP-BAD INTDF
NSPFRK	NSPINI-CFORK FAILED
NSPRTH	NSPTSK- INVALID ROUTING HEADER
NULQTA	QCHK - NO QUOTA INFO SETUP
NWJTBE	NO FREE JTB BLOCKS
OPOPAC	MRETN - TRIED TO OVER-POP AC STACK
OVFLOW	ASOFN - ALLOCATION TABLE OVERFLOW
OVRDTA	PHYSIO - OVERDUE TRANSFER ABORTED
P2RAE1	PHYH2 - RH20 REGISTER ACCESS ERROR READING REGISTER
P2RAE2	PHYH2 - REGISTER ACCESS ERR WRITING REG
P2RAE3	PHYH2 - REGISTER ACC ERR ON DONE OR ATN INTERRUPT
PAGLCK	DESPT-PAGE LOCKED
PAGNIC	GETCPP-PAGE NOT IN CORE
PGNDEL	REMFPB-PAGE NOT COMPLETELY DELETED
PH2DNA	PHYH2 - DONE INTERRUPT AND CHANNEL NOT ACTIVE
PH2IHM	PHYH2 - ILLEGAL HDW MODE - WORD MODE ASSUMED
PH2NXA	PHYH2 - ATTENTION FROM NONEXISTENT UNIT
PH2PIM	PHYH2 - RH20 LOST PI ASSIGNMENT
PH2WUI	WRONG UNIT INTERRUPTED
PHYCH1	PHYSIO - HOME BLOCK CHECK IORB ALREADY ON TWQ
PHYCH2	PHYSIO - HOME BLOCK CHECK IORB TIMED OUT
PHYCH3	PHYSIO - HOME BLOCK CHECK IORB TIMED OUT BUT WAS NOT ON TWQ
PHYICA	PHYINI - ILLEGAL ARGUMENT TO CORE ALLOC
PHYICE	PHYINI - FAILED TO ASSIGN RESIDENT STG
PHYLTF	PHYSIO - SCHLTM - UNEXPECTED LATOPT FAILURE
PHYNIR	PHYSIO - NULL INTERRUPT ROUTINE AT OPERATION DONE
PHYP0E	PHYALZ - PAGE 0 STORAGE EXHAUSTED
PIDFLF	CREPID: FREE PID LIST FOULED UP
PIDOD1	MUTCHO: PID COUNT OVERLY DECREMENTED
PIDOD2	DELPID: OVERLY DECREMENTED PID COUNT
PIITRP	INSTRUCTION TRAP WHILE PI IN PROGRESS OR IN SCHEDULER
PISKED	ENTERED SCHEDULER WITH PI IN PROGRESS
PITRAP	PAGER TRAP WHILE PI IN PROGRESS
PM2SIO	PHYM2 - ILLEGAL FUNCTION AT START IO
PRONX2	NXM DETECTED BY PROCESSOR
PSBNIC	SETPPG-PSB NOT IN CORE
PSINSK	PSI FROM NOSKED CONTEXT
PSISTK	PSI STORAGE STACK OVERFLOW
PTAIC	SWPIN - PT PAGE ALREADY IN CORE
PTDEL	DESPT-PT NOT DELETED
PTMPE	PAGE TABLE PARITY ERROR

BUGCHKS AND BUGHLTS

PTNIC1 SWPIN - PAGE TABLE NOT IN CORE
 PTNON0 SETPT0 - PREVIOUS CONTENTS NON-0
 PTOVRN UPDPGS-COUNT TOO LARGE
 PVTRP PROPRIETARY VIOLATION TRAP
 PWRFL FATAL POWER FAILURE
 PWRRES POWER RESTART
 PYILUN PHYSIO - ILLEGAL UNIT NUMBER
 RELBAD RELFRE-BAD BLOCK BEING RELEASED
 RELRNG RELFRE: BLOCK OUT OF RANGE
 RESBAD RELRES: ILLEGAL ADDRESS PASSED TO RELRES
 RESBAZ RELRES: FREE BLOCK RETURNED MORE THAN ONCE
 RESBND RELRES: RELEASING SPACE BEYOND END OF RESIDENT FREE POOL
 RFILPF REFILL ERROR PAGE FAIL
 RH2ICF PHYRH2 - INVALID CHANNEL FUNCTION
 ROTSYM IDXINI: ROOT-DIRECTORY SYMBOL TABLE IS BAD
 RP4FEX PHYP4 - ILLEGAL FUNCTION
 RP4IF2 PHYP4 - ILLEGAL FUNCTION AT STKIO
 RP4IFC PHYP4 - ILLEGAL FUNCTION AT CNV
 RP4ILF PHYP4 - ILLEGAL FUNCTION ON INTERRUPT
 RP4LTF PHYP4 - FAILED TO FIND TWQ ENTRY AT RP4LTM
 RP4SSC PHYP4 - STUCK SECTOR COUNTER
 RPGERR BADCPG-FATAL ERROR IN RESIDENT PAGE
 RSMFAI RESSMM-FAILED TO ASSIGN SWAP MON PAGE
 SEBISS SEBCPY-INSUFFICIENT STRING STORAGE IN BLOCK
 SEBUDT SEBCPY-UNKNOWN DATA TYPE
 SECEX1 SETMPG-ATTEMPT TO MAP NON-EX SECTION
 SECG37 ILSCN-SECTION NUMBER GREATER THAN 37
 SECGT1 PGRT3 - SECTION NUMBER GREATER THAN MAXSEC
 SECNX CREATING PAGE TABLE FOR NON-0 SECTION
 SERFOF CAN'T OPENF ERROR REPORT FILE
 SERFRK SERINI-CANNOT CREATE SYSERR FORK
 SERGOF SETOFI-CANNOT GTJFN/OPEN SYSERR FILE
 SHRNO0 DESPT-SHARE COUNT NON-ZERO
 SHROFD DWNSHR-OFN SHARE COUNT UNDERFLOW
 SHROFN UPSHR-OFN SHARE COUNT OVERFLOW
 SJBFRK JOB 0 CFORK FAILED
 SKDCL1 CALL TO SCHEDULER WHEN ALREADY IN SCHEDULER
 SKDCL2 CALL TO SCHEDULER WHEN ALREADY IN SCHEDULER
 SKDMPE MPE IN SCHEDULER OR PI CONTEXT
 SKDPF1 PAGE FAIL IN SCHED CONTEXT
 SKDTRP INSTRUCTION TRAP WHILE IN SCHEDULER
 SNPIC SNPFN3: INSTRUCTION BEING REPLACED HAS CHANGED
 SNPLKF SNPFN0: CANNOT LOCK DOWN PAGE INTO MONITOR
 SNPODB SNPF4C: COUNT OF INSERTED BREAK POINTS OVERLY DECREMENTED
 SNPUNL SNPF5A: CANNOT UNLOCK SNOOP PAGE
 SPTFL1 SPT COMPLETELY FULL
 SPTFL2 SPT COMPLETELY FULL
 SPTPIC SWPIN - SPT PAGE ALREADY IN CORE
 SPTSHR UPSHR-SPT SHARE COUNT OVERFLOW
 SPWRFL SPURIOUS POWER FAIL INDICATION
 SRQOVF SCDRQ-SCHED REQUEST QUEUE OVERFLOW
 STKOVF MONITOR STACK OVERFLOW
 STRBAD ASOFN-ILLEGAL STRUCTURE NUMBER
 STRMSG MSTDMC - COULD NOT SEND MESSAGE TO ALLOCATOR
 STZERO FILINI: STRTAB ENTRY FOR PS IS 0
 SUMNR1 AJBALS-SUMNR INCORRECT
 SUMNR2 SUMNR INCORRECT
 SWPASF CHKBAT-FAILED TO ASSIGN BAD SWAPPING ADDRESS
 SWPFPE SWAP ERROR IN SENSITIVE FILE PAGE
 SWPIBE SWAP ERROR IN INDEX BLOCK
 SWPJSB SWAP ERROR IN JSB PAGE
 SWPMNE SWAP ERROR IN SWAPPABLE MONITOR
 SWPPSB SWAP ERROR IN PSB PAGE
 SWPPT SWAP ERROR IN UNKNOWN PT

BUGCHKS AND BUGHLTS

SWPPTP SWAP ERROR IN UNKNOWN PT PAGE
 SWPUPT SWAP ERROR IN UPT, OR PSB
 SYSERF LOGSST-NO SYSERR STORAGE FOR RESTART ENTRY
 TM2CCI PHYM2 - TM02 SSC OR SLA WONT CLEAR
 TM2HER TM2ERR - IS.HER SET ON SUCCESSFUL RETRY
 TM2IDM PHYM2 - ILLEGAL DATA MODE AT DONE INT
 TM2IDX PHYM2 - ILLEGAL RETRY BYTE POINTER
 TM2IF2 PHYM2 - ILLEGAL FUNCTION ON COMMAND DONE
 TM2IRF PHYM2 - ILLEGAL FUNCTION DURING RETRY
 TM2N2S PHYM2 - MORE DRIVES THAN TABLE SPACE, EXCESS IGNORED
 TM2NUD PHYM2 - CHANNEL DONE INTERRUPT BUT NO UNIT ACTIVE
 TM2RFU PHYM2 - ERROR RECOVERY CONFUSED
 TM2UNA PHYM2 - DONE INTERRUPT AND UDB NOT ACTIVE
 TRPSIE NO MONITOR FOR TRAPPED FORK
 TTBAD1 BAD DEVICE DESIGNATOR FOR TERMINAL AT ATACH2
 TTDAS1 HLTJB: UNABLE TO DEASSIGN CONTROLLING TERMINAL
 TTICN0 TCI - NO BUFFER POINTER BUT COUNT NON-0
 TTILEC TTSND-UNRECOGNIZED ESCAPE CODE
 TTNAC1 LINE NOT ACTIVE AT PTYOPN
 TTNAC3 CTY NOT ACTIVE AT FSIPBO
 TTNAC4 CTY NOT ACTIVE AT FSIPBI
 TTNAC5 CTY NOT ACTIVE AT FSIINI
 TTNAC7 DEALLOCATING INACTIVE LINE
 TTNAC8 CAN'T ASSIGN TERMINAL AT DEVINI
 TTOCN0 TTSTO - NO BUFFER BUT COUNT NON-0
 TTONOB TTY OUTPUT - NO BUFFER BUT COUNT NON-0
 TTYBBO TTYSRV-BIG BUFFER OVERFLOW
 TTYNTB RAN OUT OF TTY BUFFERS
 TWQNUL PHYSIO - PWQ OR TWQ WAS NULL AT A SEEK OR TRANSFER COMPLETION
 UIONIR UDSKIO - NO IORB FOR NOSKED FORK
 ULKBAD UNLOCKING TTY WHEN COUNT IS ZERO
 ULKSTZ OVERLY DECREMENTED STRUCTURE LOCK
 UNBFNF UNBLK1 - FORK NOT FOUND
 UNPGF1 MEMPAR-UNKNOWN PAGE FAIL TRAP
 UNPGF2 UNKNOWN PAGE FAILURE TYPE
 UNPIRX UNPIR-NO PSI IN PROGRESS
 UNTRAP UNKNOWN TRAP INSTRUCTION
 UNXMPE PFCDFE-UNEXPECTED PARITY ERROR TRAP
 USECG0 USER SECTION NUMBER GREATER THAN 0
 USGHOL LOST PAGE(S) IN USAGE FILE
 UXXCKP COULDN'T CREATE CHECKPOINT FILE
 UXXCL1 UNABLE TO CREATE NEW USAGE FILE
 UXXCL2 UNABLE TO OPEN NEW USAGE FILE
 UXXCL3 UNABLE TO CLOSE USAGE FILE
 UXXCRE CANNOT CREATE USAGE FILE
 UXXFAI USAGE JSYS FAILURE
 UXXFIT CHECKPOINT FILE NOT IN CORRECT FORMAT FOR THIS SYSTEM, REBUILDING...
 UXXILL USGMES: ILLEGAL FUNCTION CODE
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 UXXOPN UNABLE TO OPEN USAGE FILE
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 VERBIT NSPTSK- NODE VERIFICATION REQUESTED
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