900 Series HP 3000 Computer Systems

Performing System Operation Tasks

HEWLETT PACKARD

Printing History

The following table lists the printings of this document, together with the respective release dates for each edition. The software version indicates the version of the software product at the time this document was issued. Many product releases do not require changes to the document. Therefore, do not expect a one-to-one correspondence between product releases and document editions.

Edition	Date	Software Version
First Edition	October 1989	A.20.00
Second Edition	April 1990	A.21.00
Third Edition	December 1990	B.30.00
Fourth Edition	June 1992	B.40.00
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Preface

MPE/iX, Multiprogramming Executive with Integrated POSIX, is the latest in a series of forward-compatible operating systems for the HP 3000 line of computers.

In HP documentation and in talking with HP 3000 users, you will encounter references to MPE XL, the direct predecessor of MPE/iX. MPE/iX is a superset of MPE XL. All programs written for MPE XL will run without change under MPE/iX. You can continue to use MPE XL system documentation, although it may not refer to features added to the operating system to support POSIX (for example, hierarchical directories).

Finally, you may encounter references to MPE V, which is the operating system for HP 3000s, not based on the PA-RISC architecture. MPE V software can be run on the PA-RISC (Series 900) HP 3000s in what is known as *compatibility mode*.

Tasks and Procedures Used for System Operations

The *Performing System Operation Tasks* manual is an introduction to operations of the 900 Series HP 3000. It gives procedures and processes needed by the system operator to perform daily tasks. It is written for the system operator who has not completed Hewlett-Packard training courses and has approximately zero to six months experience with computers, specifically Hewlett-Packard computers.

There are eleven chapters and an index in this manual. Ten chapters contain procedures and processes for performing system operation tasks. Chapter eleven contains a problem solving section. The index cross-references procedural information.

Managing Your System

The system operator is typically the person who manages the daily system operations. This person is responsible for managing hardware and software tasks. Some of the hardware responsibilities include:

- Loading and unloading tape drives.
- Managing disk drives.
- Monitoring printer activity.

Software tasks include:

- Managing jobs and sessions.
- Monitoring the console.
- Performing system startups and shutdowns.

Tasks and Procedures

This manual is written in a task format. If you have a task you wish to perform you simply look up that task in the table of contents or in the index, turn to that particular section, read the introduction and begin performing your task.

Most sections open with an introduction, then the action steps for the task followed by an explanation with examples.

How to Get Started

This manual is a companion to the *Performing System Management Tasks* manual. The table of contents of the *Performing System Management Tasks* manual should be reviewed to become familiar with those tasks and how they relate to the tasks in this manual.

In This Book

This manual is your guide to the system operation tasks for the 900 Series HP 3000.

Chapter 1 *Managing Tapes and Tape Drives* describes how to load and unload tape drives, handle tape requests, and organize tape storage.

Chapter 2 *Managing Disk Drives* explains the tasks used to load and unload disk drives and monitor disk space.

Chapter 3 *Managing Printers* describes the tasks needed to start and stop the printer, load and adjust paper and clear paper jams.

Chapter 4 *Managing Printer Activity* explains how to alter print access, manage print files, and control printer activity.

Chapter 5 *Performing System Functions* discusses how to perform console tasks, manage jobs and sessions, manage directories, communicate with the users, and how to get online help with MPE/iX commands and error messages.

Chapter 6 *Copying Files to Tape* discusses how to copy computer files onto a tape for safekeeping.

Chapter 7 *Copying Files from Tape* explains how to transfer files from a STORE tape to your computer's disk.

Chapter 8 *Backing Up the System* describes the importance of planning, managing and performing regularly scheduled system backups.

Chapter 9 *Starting and Recovering the System* describes preliminary startup procedures. This includes starting the system under normal or without recovery.

Chapter 10 *Shutting Down the System* explains how to shutdown the system and outlines shutdown procedures.

Chapter 11 *Problem Solving* provides a checklist to assist you with troubleshooting terminals and your console.

Index contains cross-reference location information.

Conventions

UPPERCASE

In a syntax statement, commands and keywords are shown in uppercase characters. The characters must be entered in the order shown; however, you can enter the characters in either uppercase or lowercase. For example:

COMMAND

can be entered as any of the following:

command   Command   COMMAND

It cannot, however, be entered as:

comm   com_mand   comamnd

italics

In a syntax statement or an example, a word in italics represents a parameter or argument that you must replace with the actual value. In the following example, you must replace *filename* with the name of the file:

COMMAND *filename*

bold italics

In a syntax statement, a word in bold italics represents a parameter that you must replace with the actual value. In the following example, you must replace **filename** with the name of the file:

COMMAND(**filename**)

punctuation

In a syntax statement, punctuation characters (other than brackets, braces, vertical bars, and ellipses) must be entered exactly as shown. In the following example, the parentheses and colon must be entered:

(*filename*):(*filename*)

underlining

Within an example that contains interactive dialog, user input and user responses to prompts are indicated by underlining. In the following example, yes is the user's response to the prompt:

Do you want to continue? >> yes

{ }

In a syntax statement, braces enclose required elements. When several elements are stacked within braces, you must select one. In the following example, you must select either ON or OFF:

COMMAND $\left\{ \begin{array}{l} \text{ON} \\ \text{OFF} \end{array} \right\}$

[ ]

In a syntax statement, brackets enclose optional elements. In the following example, OPTION can be omitted:

COMMAND *filename* [OPTION]

When several elements are stacked within brackets, you can select one or none of the elements. In the following example, you can select OPTION or *parameter* or neither. The elements cannot be repeated.

COMMAND *filename* $\left[\begin{array}{l} \text{OPTION} \\ parameter \end{array} \right]$

Conventions (continued)

[...]   In a syntax statement, horizontal ellipses enclosed in brackets indicate that you can repeatedly select the element(s) that appear within the immediately preceding pair of brackets or braces. In the example below, you can select *parameter* zero or more times. Each instance of *parameter* must be preceded by a comma:

[,*parameter*][...]

In the example below, you only use the comma as a delimiter if *parameter* is repeated; no comma is used before the first occurrence of *parameter*:

[*parameter*][,...]

| ... | In a syntax statement, horizontal ellipses enclosed in vertical bars indicate that you can select more than one element within the immediately preceding pair of brackets or braces. However, each particular element can only be selected once. In the following example, you must select **A, AB, BA**, or **B**. The elements cannot be repeated.

$$\left\{ \begin{array}{c} A \\ B \end{array} \right\} | \ ... \ |$$

...   In an example, horizontal or vertical ellipses indicate where portions of an example have been omitted.

Δ   In a syntax statement, the space symbol Δ shows a required blank. In the following example, *parameter* and *parameter* must be separated with a blank:

(*parameter*)Δ(*parameter*)

⬭   The symbol ⬭ indicates a key on the keyboard. For example, (RETURN) represents the carriage return key or (Shift) represents the shift key.

(CTRL)*character*   (CTRL)*character* indicates a control character. For example, (CTRL)Y means that you press the control key and the Y key simultaneously.

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Managing Tapes and Tape Drives

Of all the devices connected to the computer, you have the most direct control over the tape drive. Users must ask to use it by issuing a message, called a *tape request*, that is sent to the console. As a system operator, you are responsible for mounting and dismounting tapes in response to user tape requests. You also manage tape drives and maintain tape storage.

Figure 1-1 illustrates the different types of tape drives you may see in your computer room.

MN0330-1-1

In this chapter, you will find the procedures to perform the following tasks:

- Loading and unloading manual tape drives.
- Loading and unloading automatic tape drives.
- Loading and unloading digital data storage (DDS tape drives.)
- Handling tape requests.
- Securing and labeling tapes.
- Organizing tape storage.
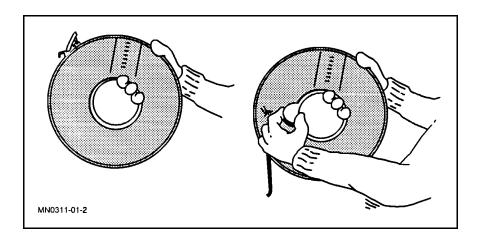
Loading Tape Drives

Your computer room may be equipped with various kinds of tape drives. In this section, you will find information on how to load and unload three different tape drives:

- Manual tape drives.
- Automatic tape drives.
- Digital data storage (DDS) tape drive.
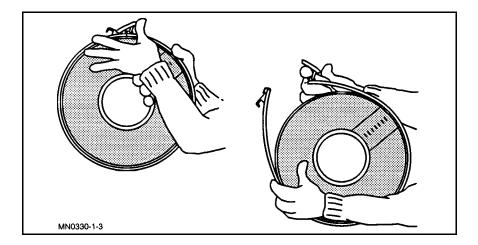
If this section does not cover information for your tape drive, check your hardware documentation.

To load a manual tape drive

1. Select a tape. If you want to write data to your tape, insert a write-enable ring . If you only want to read data, leave the write-enable ring off.

MN0311-01-2
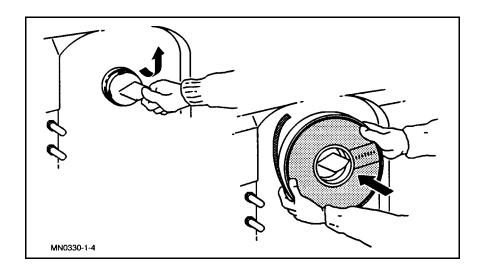
2. Open the door of the tape drive.
3. Unlatch and remove the plastic band that wraps around the reel.

MN0330-1-3
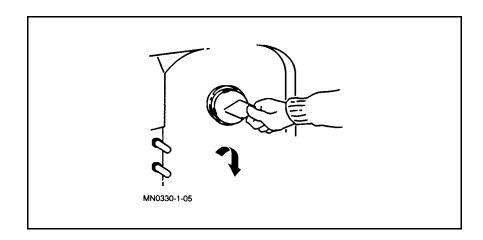
You will see two hubs on the tape drive, one without a reel and one containing an empty, permanently fixed reel.
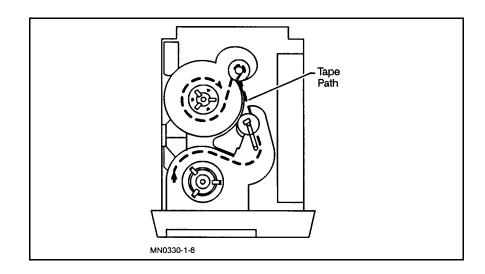
4. If the spool without a reel has a latch, flip the latch up.

5. Mount the reel onto the empty spool.

MN0330-1-4
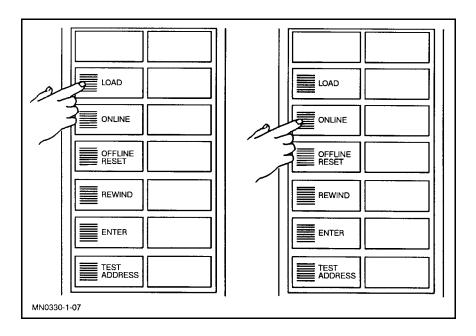
6. Close the locking lever.

MN0330-1-05

7. Thread the tape along the tape path and onto the permanently fixed reel. Ensure that the tape is secured by winding it on the permanently fixed reel about three rotations.

MN0330-1-6
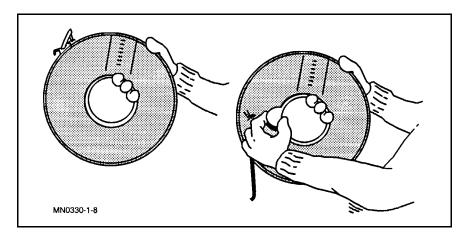
8. Close the door.

9. Press the (LOAD) button.

10. When the tape stops loading, press the (ONLINE) button.

MN0330-1-07
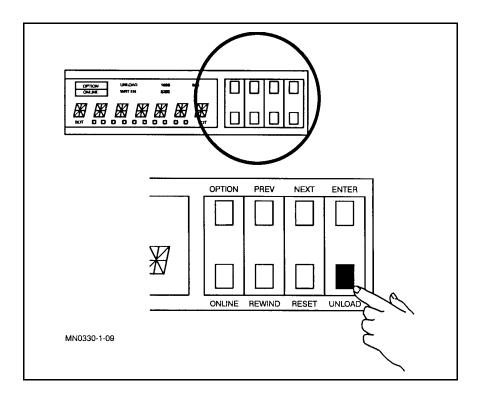
To load an automatic tape drive
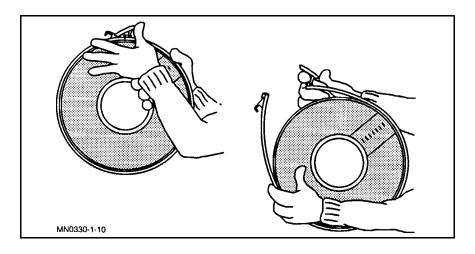
1. Select a tape. If you want to write data to your tape insert a write-enable ring. If you only want to read data, leave the write-enable ring off.

MN0330-1-8
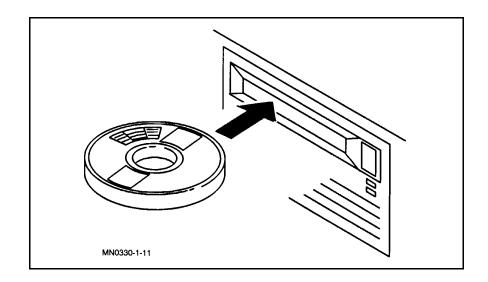
2. Press the [UNLOAD] button to open the tape drive door.

MN0330-1-09
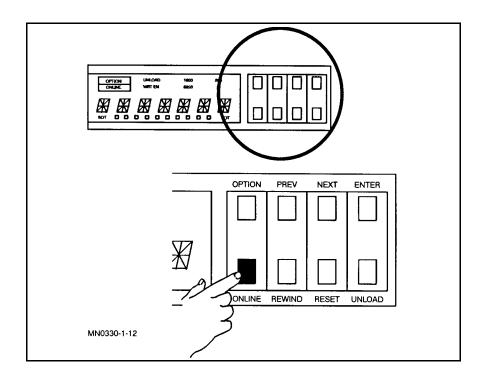
3. Unlatch and remove the plastic band on the tape.

MN0330-1-10

4. Slide the tape into the center of the tape door opening.

MN0330-1-11

5. Close the door.

6. Press the (ONLINE) button.

MN0330-1-12

7. When the ONLINE indicator light stays on, reply to the tape request message at the console.

   a. At the console, log on as `OPERATOR.SYS.`.

   b. At the ":" prompt, enter:

      `REPLY` *nn,m* (Return)
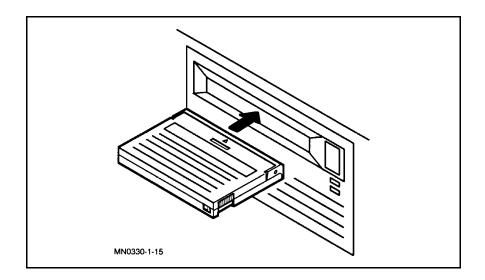
   The *nn* is the process identification number (PIN) and *m* is the logical device number (LDEV).

To load a DDS tape drive

What is a DDS tape drive ? It is a tape drive that stores data on cassette tapes in a format called digital data storage.

To load a digital data storage (DDS) tape drive:

1. Insert a tape cassette squarely (not at an angle) into the slot in the front of the drive. Make sure that the label is facing uppermost, then follow the arrowhead on the cassette case. Only *minimum* force is necessary when doing this. *Do not* restrain the cassette when pushing it into the drive because it could cause it to jam in the mechanism. The drive will automatically eject an incorrectly loaded cassette after 10 seconds.

MN0330-1-15
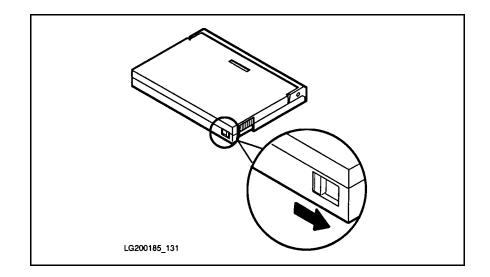
2. Using single-finger pressure on the rear of the cassette tape will allow the autoloading mechanism to take the cassette and load it into the drive. The loading sequence takes about 25 seconds.

   When the load sequence is finished, the cassette light (upper) remains lit a steady green if the cassette is write-enabled, or yellow if the cassette is write-protected. The drive light (lower) goes out until the host computer accesses the drive.

To allow a DDS tape to be written on

If you want to allow a cassette tape to be written to, as well as read from, you can place the tape in read/write mode.
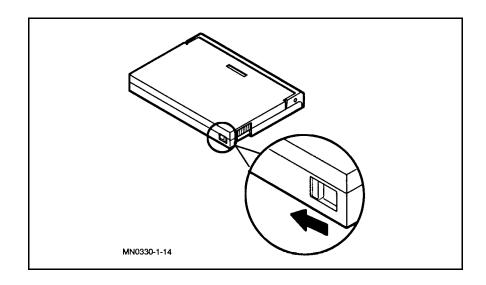
1. To place a DDS cassette in read/write mode, slide the tab on the rear edge of the cassette so that the recognition hole is closed.

LG200185_131

To protect data on a DDS tape
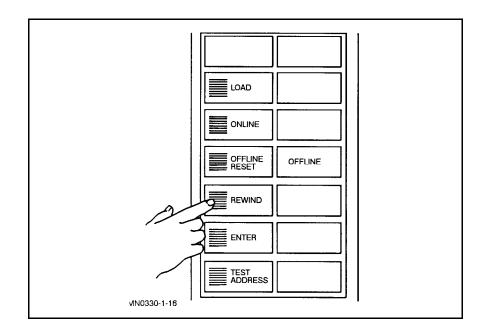
If you want to protect the data on a cassette from being altered or overwritten, you can write-protect the cassette.

1. Slide the tab on the right rear edge of the cassette so that the recognition hole is open, as shown below.

MN0330-1-14
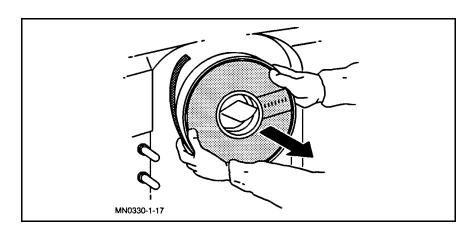
To unload a manual tape drive
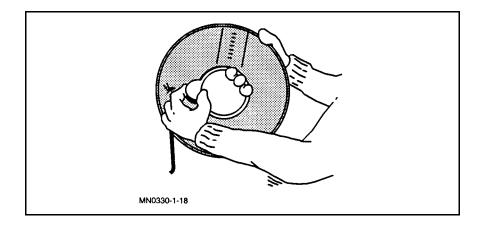
1. When your tape stops moving and the tape drive displays OFFLINE, press the (REWIND) button.

MN0330-1-16
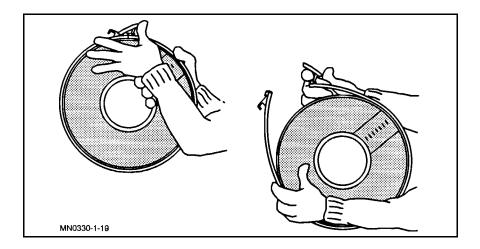
2. After the reel stops spinning, open the tape drive door.

3. Remove the reel tape from the tape drive.

MN0330-1-17

4. If you have been writing to tape, take off the write-enable ring.

MN0330-1-18
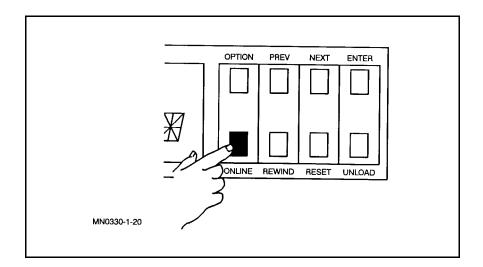
5. Put the plastic band on and latch it.

MN0330-1-19
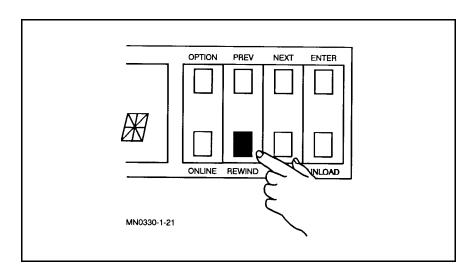
6. Close the tape drive door.

To unload an automatic tape drive
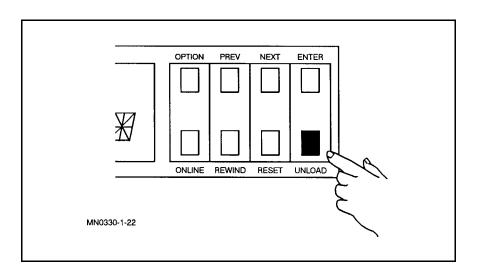
1. Press the (ONLINE) button to take the drive offline. The ONLINE light is on when the system is online.

MN0330-1-20

2. Press the (REWIND) button to rewind the tape back onto the supply reel.

MN0330-1-21
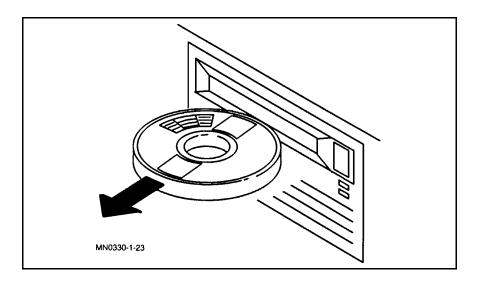
3. Press the (UNLOAD) button.

MN0330-1-22
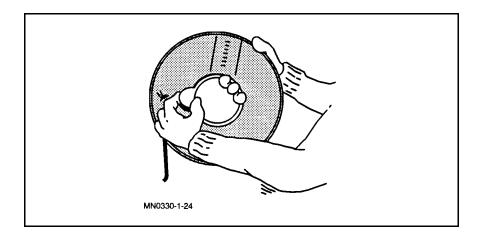
At this point, the drive unloads the tape and opens the door.

4. Remove your tape.

MN0330-1-23
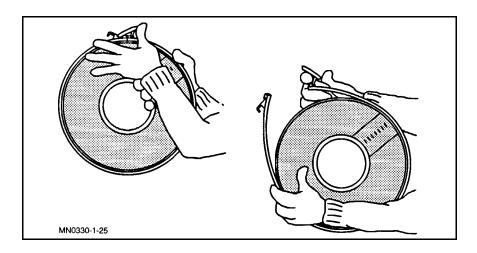
5. Remove the write-enable ring, if you have been writing to tape.

MN0330-1-24
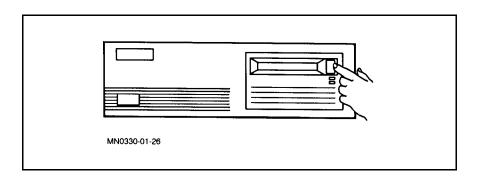
6. Put the plastic band on and latch it.

MN0330-1-25

7. Close the door to the tape drive.

To unload a DDS tape drive

1. Press the (UNLOAD) button (front panel).

MN0330-01-26

This starts a sequence that rewinds the tape to the beginning and ejects the cassette. The sequence takes about 10 seconds.

During the unload sequence, both front panel lights pulse green (yellow, if the tape is write-protected).

2. Remove the tape.
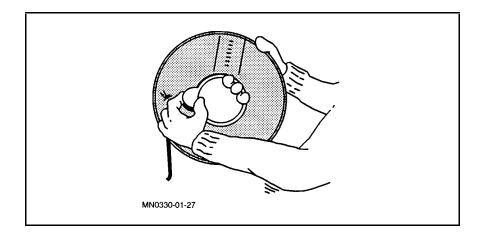
Handling Tape Requests

If your system does not answer tape requests automatically, you must answer them with the REPLY command after preparing the tape and the device. If your system answers automatically, you only need to prepare the reel tape and tape drive for use.

To display a tape request

1. At the console, hold down the (CTRL) key and press (A).

2. When the "=" prompt appears, enter:

   RECALL (Return)

   The computer responds:

```
THE FOLLOWING REPLIES ARE PENDING:
?13:57/#S25/43/LDEV 5 FOR "T" ON TAPE (NUM),
WRITE RING (Y/N)?
```

The number 13:57 is the time, #S25 is the session number, 43 is the process identification number (PIN) and 5 is the logical device number (LDEV).

You need to know the user's PIN and the tape drive LDEV number in order to respond.

If there are no tape requests or pending replies, the computer responds:

```
NO REPLIES PENDING (CIWARN 3020)
```

When the computer responds to the RECALL command, it does not automatically display the system prompt on the screen. Press (Return) to get the prompt again.

To respond to a tape request

1. Mount the tape and prepare the tape drive.

2. At the console, hold down the (CTRL) key and press (A) at the same time.

3. At the "=" prompt, enter the REPLY command, specifying the PIN and the LDEV number of the request to which you are replying:

   REPLY 43,5 (Return)

As soon as you press (Return), the BUSY light on the tape drive comes on, or the tape begins moving. Also, the system tells you what files it has copied by listing them on the console.

Securing and Labeling Tapes
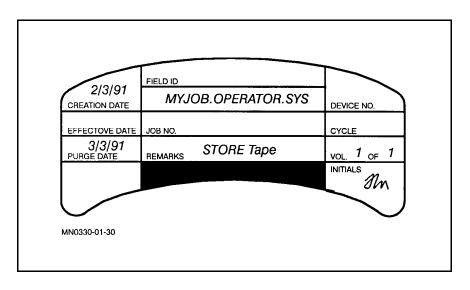
It is important to identify each tape. The following examples provide tape security and labeling information.

To secure and label reel tapes

1. Remove the write ring to ensure that the tape is write-protected.

MN0330-01-27

2. Label the tape.

MN0330-01-30

2/3/91	FIELD ID	
CREATION DATE	*MYJOB.OPERATOR.SYS*	DEVICE NO.
EFFECTOVE DATE	JOB NO.	CYCLE
3/3/91 PURGE DATE	REMARKS *STORE Tape*	VOL. 1 OF 1
		INITIALS
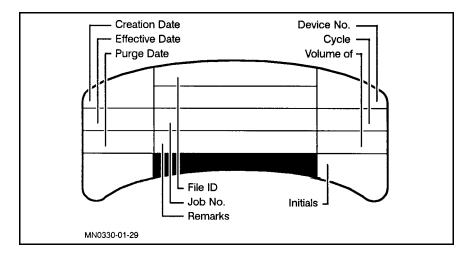
a. Include the following information on the label:

Table 1-1.

Label	Description
Requestor's name	The name of the person who requested the tape.
Creation date	The date the tape is created.
Effective date	The date the tape can be used.
Purge date	The date the files can be erased.
File identification	The name of the account or group.
Job Number	The job number.
Remarks	Whether the tape is a "STORE" tape.
Device number	The device number used to create the tape.
Volume n of m	The number of tapes of the tape and the total number of tapes.
Initials	The operator's initials.
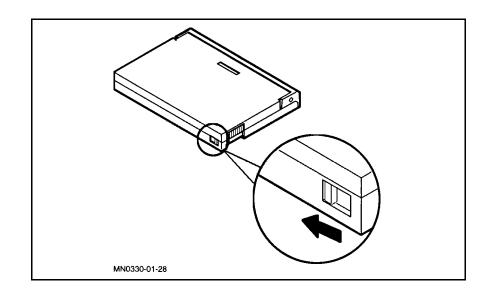
b. Position the label on the face of the tape (opposite side from the write ring).

Reel tape labels should look similar to this:
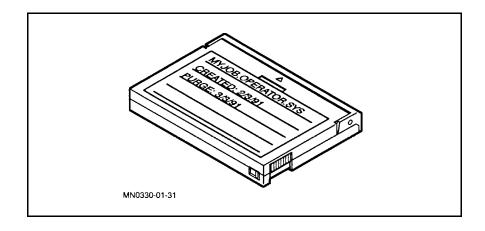
**To secure and label
DDS tapes**

1. Remove the cassette from the DDS tape drive.

2. Slide the tab to the right side of the DDS cassette, if you have been writing to tape.

MN0330-01-28

3. Prepare and position the label.
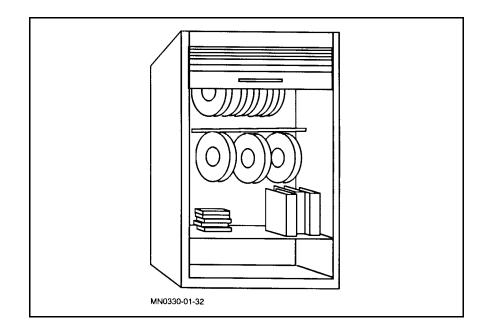
Cassette tape labels should look similar to the example below:

MN0330-01-31

Organizing Tape Storage

Establishing a tape library for storing reel and cassette tapes is essential. In your tape library, you should include:

- A safe place to keep tapes, such as a metal cabinet or vault.

- A large stock of blank or scratch reel and DDS tapes.

- A record of each tape's contents.

MN0330-01-32

The exact number of reel tapes you need depends on how much information is stored in your computer. Using new tapes ensures the best possible data integrity. You can use previously used tapes if they are in good condition and if you no longer need the information on them. Tapes wear out and become unreliable after several uses.
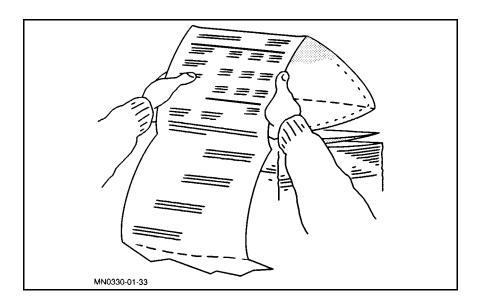
Keeping Records of Your Tapes
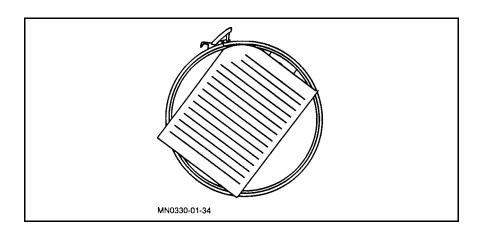
If you are responsible for a large tape library, organization is the key to success. To ensure that each tape is easily identified, label it and attach a printout of the tape's contents.

To keep a record of each tape's contents

To keep a record of each tape's contents, at the console:

1. When you enter the `SHOW=OFFLINE` option of the `STORE` or `RESTORE` command, your printout will look similar to this:

MN0330-01-33

2. Unload and label the tape.

3. Attach the printout directly to the reel tape with a piece of tape or keep it in a file cabinet organized by date.

MN0330-01-34
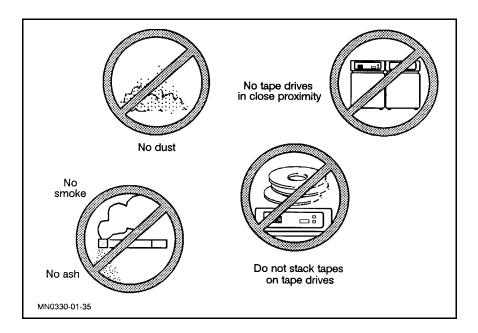
To store reel and DDS tapes

Environmental conditions can affect the reliability of data stored on tapes. Store tapes:
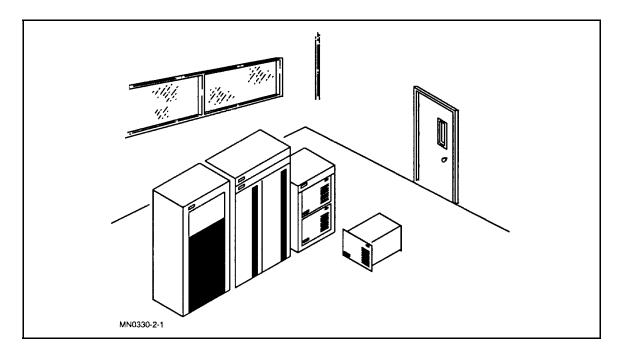
- Away from magnetic material.
- Away from disk drives.
- Away from smoking area.
- Away from water and moisture.
- Within proper temperature and humidity ranges.

To protect tapes from the environment, always store them in a controlled environment or a fireproof safe.

MN0330-01-35

2

Managing Disk Drives

A disk is a shareable device used as an input and output tool. It offers the fastest data access of all devices. A disk drive is used to read and write data to a disk. The following illustration displays some disk drives.

MN0330-2-1

In this chapter, you will find the procedures to perform the following tasks:

- Operating a disk drive.

- Loading disk packs.

- Unloading disk packs.

- Unloading a nonsystem disk pack.

- Monitoring disk space.

- Freeing disk space by creating a tape.

- Storing disk packs.

Operating a Disk Drive

The disk drives described in this section are high-performance, random access, data storage devices designed for use in medium and large-sized computer systems. This section provides direction for operating a disk drive that has been installed. For information on installation, refer to the disk drive operations and installations manual.

Before operating a disk drive, you should be familiar with some of the controls and indicators on the drive. In the illustration below, the front panel controls and indicators are shown.

DIAGNOSTIC SWITCH	RUNTIME MODE				DIAGNOSTIC MODE			
S1	◼☐				☐◼			
CHANNEL ADDRESS / DIAGNOSTIC	0	1	2	3	4	5	6	7
S2	◼☐	◼☐	◼☐	◼☐	☐◼	☐◼	☐◼	☐◼
S3	◼☐	◼☐	☐◼	☐◼	◼☐	◼☐	☐◼	☐◼
S4	◼☐	☐◼	◼☐	☐◼	◼☐	☐◼	◼☐	☐◼

MN0330-2-2
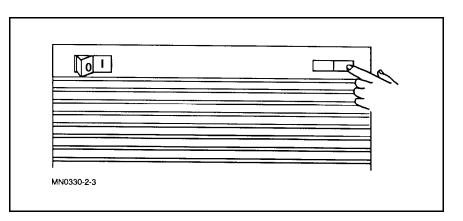
The following table describes the functions of the disk drive controls and indicators.

Table 2-1.

Controls	Description
LINE ˜ SWITCH	The LINE ˜ switch controls the application of AC power to the disk drive. Power is ON when the switch is in the 1 (in) position and OFF when it is in the 0 (out) position. The 1 and 0 markings correspond to international symbols presently in use.
CHANNEL ADDRESS/DIAGNOSTIC SWITCH	The channel address/diagnostic switch is a 4-segment switch assembly that selects the system channel address and the tape drive self-diagnostics. The switch segments are read by the controller at the power-on sequence.
RUN TIME MODE	When switch S1 is set to the RUN TIME MODE position, a series of hardware tests are performed at the power-on sequence. Following successful completion of the hardware diagnostic routines, the drive comes online.
DIAGNOSTIC MODE	The DIAGNOSTIC MODE position is used for service purposes and should not be used during normal operation of the tape drive.
LED DISPLAY	The front panel LED display provides a visual indication of the operational status of the tape drive. The LED display consists of a single red, green and yellow LED.

To manage a disk drive after it has been installed
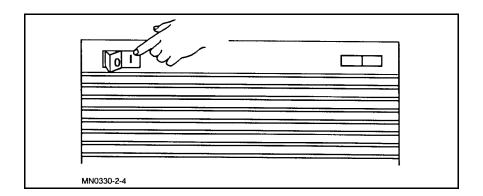
1. Press the power switch to the ON position.

MN0330-2-3

The system performs an internal self-test diagnostic, which checks the key operations of the drive.

2. Press the LINE switch to the inner position.

MN0330-2-4

There is another self-test diagnostic, which lasts a few moments. You will then hear two sounds from the drive during the diagnostic:

a. The first is the spindle motor coming up to speed.

b. The second is the actuator performing a drive calibration and a series of seeks.

A flashing green LED indicates that the drive has opened communication with the host computer. The drive is now ready to accept data.

For more information, refer to your disk drive's operation manual.

Loading and Unloading Disk Packs
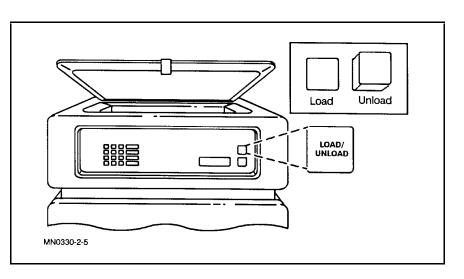
As a system operator, you are responsible for maintaining your system's disk drives. Each disk drive has either a removable disk pack or nonremovable disk pack. The removable disk pack is available in two styles:

- A two-pack.

- An eight-pack.
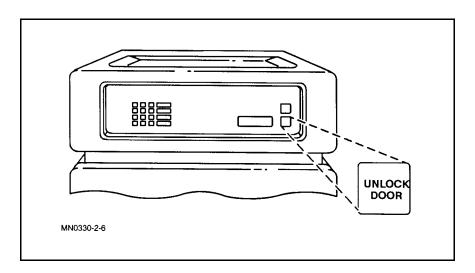
If you have a removable disk pack, the following procedures assist you with loading and unloading removable disk packs.

To load a disk pack
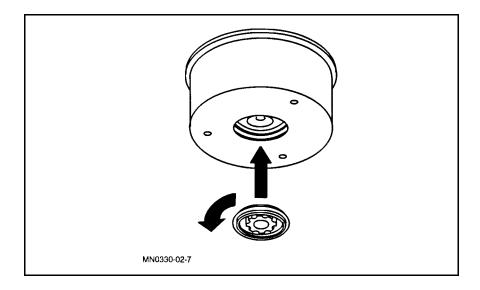
1. Set the (LOAD/UNLOAD) button to the outer position.

MN0330-2-5
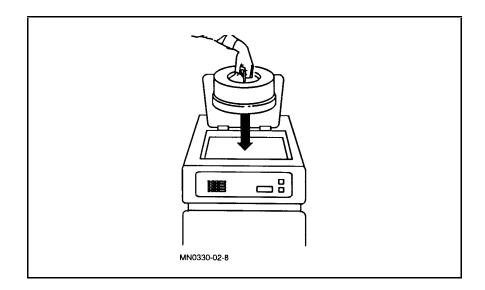
2. Press the (UNLOCK DOOR) button. When the DOOR OPEN message appears, lift the top door.

MN0330-2-6
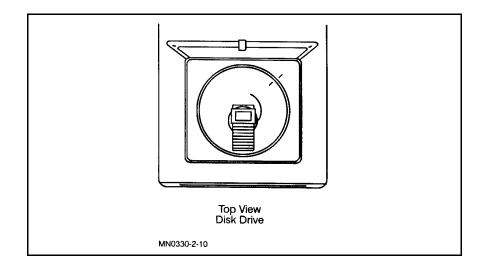
3. Detach the removable base of the disk pack.

MN0330-02-7
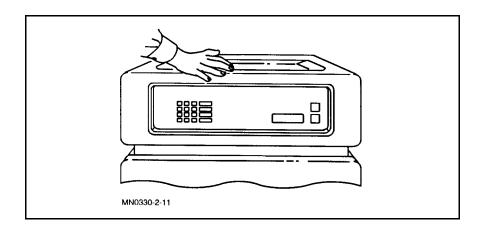
4. Holding the disk pack by the handle, lower it into the drive.

MN0330-02-8
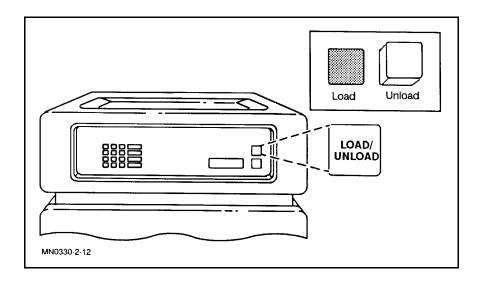
5. Align the indexing marks and turn the disk pack clockwise until it stops.

Top View
Disk Drive

MN0330-2-10

6. Fold the handle over so that it lies flat against the disk pack, and store the removable base on top of the handle so that it does not get lost.

MN0330-2-11

7. Close the top door and press the (LOAD/UNLOAD) button to the LOAD position.

MN0330-2-12

Once the (LOAD) button is pressed, the disk drive spins up to speed and performs a diagnostic routine. The following messages will appear in the window display:

- TESTING

- SPIN UP

- AIR PURGE

- TESTING

- DRIVE # (The drive number will be one or two numbers between zero and seven.)
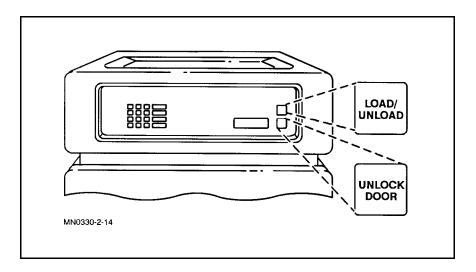
The AIR PURGE message refers to the elimination of contaminants and air in the disk drive. The disk drive operates in a vacuum environment. Data is not manipulated in any way.

To unload your disk pack

1. You must shut down the operating system (MPE/iX) before attempting to unload a disk from the system domain.
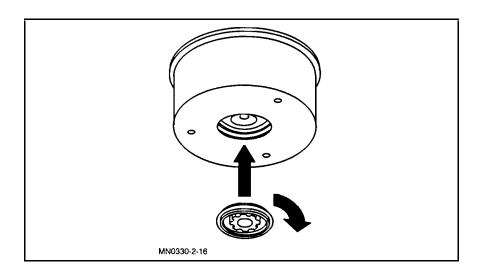
If the (LOAD/UNLOAD) button on the disk drive is inadvertently pressed while the system is running, the system disk refuses the UNLOAD. The ACTIVITY panel indicates BUSY, momentarily, and the following message appears on the system console:

```
UNLOAD ON LDEV#n DENIED. =SHUTDOWN MUST PRECEDE AN
UNLOAD ON A SYSTEM DISC
Warning: REPOSITION BUTTON BACK TO LOAD POSITION.
```

If the (LOAD/UNLOAD) button is not repositioned to the LOAD position and a powerfail occurs, the drive spins down and a NOT READY message appears on the system console. At this point, it is necessary to reposition the (LOAD/UNLOAD) button back to the LOAD position in order to spin the drive up.

2. After you have shut down the operating system, set the (LOAD/UNLOAD) button to the outer position (UNLOAD).

3. Press the (UNLOCK DOOR) button after the disk drive spins down.

MN0330-2-14

4. When the DOOR OPEN message appears, lift the top door. Lift the handle of the disk pack. Turn the disk pack counterclockwise until the indexing marks are aligned, and then lift out the pack.

MN0330-2-16

5. Place the removable base on the underside of the disk pack.
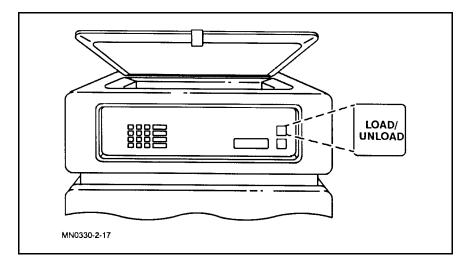
To unload a nonsystem disk

No disk packs can be unloaded when in use.

1. If the (LOAD/UNLOAD) button is pressed on a nonsystem disk while it is in use, the following error message displays on the system console:

```
DISMOUNT REQUEST FOR LDEV#n DENIED.  NON-SYSTEM DISC IN USE!
Warning: REPOSITION BUTTON BACK TO LOAD POSITION.
```

2. Reposition the button back to the LOAD position. Wait until the disk is no longer in use. Then press the button again.

MN0330-2-17

If you forget to reposition the (LOAD/UNLOAD) button after receiving the above warning, and a powerfail occurs, the disk spins down (unloads). It is then necessary for you to restart the disk by resetting the (LOAD/UNLOAD) button to the LOAD (in) position.

Monitoring Disk Space

DISCFREE is a utility that you can use to determine the amount of free space on a disk. You can enter any of the following commands to invoke the DISCFREE utility:

- `DISCFREE`

- `RUN DISCFREE.PUB.SYS;INFO="`[*format*]`[,`*ldev*`]"`

- `DISCFREE` [*format*]

Format values include the following:

A	Shows numbers of blocks by size categories.
B	Shows transient and free space allocations in sectors.
C	Shows transient and free space allocations in percentage of total device capacity.
D	Shows disk allocation summary in sectors.
E	Shows disk allocation summary in percentage of total space.

The DISCFREE utility provides five types of reports:

- Histogram
- Allocation
- Allocation format 2
- Summary
- Summary format 2

To monitor your disk space

Enter:

DISCFREE (Return)

The system responds with a copyright statement and the following prompt:

```
DISCFREE A.01.02 Copyright (C) Hewlett-Packard 1989.  All rights reserved.
 TUE, FEB 13, 1991,  3:02 PM

Syntax is: DISCFREE [<format>][,<ldev>]

 Where <format> is one of the following:
  A, HISTOGRAM, 1: to see a histogram.
  B, ALLOCATION, 2: to see disc allocation.
  C, ALLOCATION2, 3: to see disc allocation format 2.
  D, SUMMARY, 4: to see disc allocation summary.
  E, SUMMARY2, 5: to see disc allocation summary format 2.

<ldev> is the logical device number of a disc.

Enter [<format>][,<ldev>] :_
```

To skip the copyright statement and the above prompt, enter a *format value* with the command as follows:

DISCFREE A

To see distribution of disk space　　To see the distribution of disk space with blocks of contiguous space (blank sectors that are adjacent to each other), use format value A. The resulting histogram groups these blank sectors according to size.

```
LDEV :     1 -- (MPEXL_SYSTEM_VOLUME_SET:MEMBER1)

LARGEST FREE AREA:        527984  TOTAL FREE SPACE:       546784

    0 BLOCK(S) OF       1-      9 CONTIGUOUS SECTORS =        0 FREE SECTORS.  0%
   19 BLOCK(S) OF      10-     99 CONTIGUOUS SECTORS =      704 FREE SECTORS.  0%
    7 BLOCK(S) OF     100-    999 CONTIGUOUS SECTORS =     1856 FREE SECTORS.  0%
    8 BLOCK(S) OF    1000-   9999 CONTIGUOUS SECTORS =    16240 FREE SECTORS.  3%
    0 BLOCK(S) OF   10000- 99999 CONTIGUOUS SECTORS =        0 FREE SECTORS.  0%
    1 BLOCK(S) OF 100000-AND UP CONTIGUOUS SECTORS =   527984 FREE SECTORS. 97%


--------------------------------------------------------------------------------
LDEV :     2 -- (MPEXL_SYSTEM_VOLUME_SET:MEMBER2)

LARGEST FREE AREA:       1115936  TOTAL FREE SPACE:      1177824

    0 BLOCK(S) OF       1-      9 CONTIGUOUS SECTORS =        0 FREE SECTORS.  0%
   19 BLOCK(S) OF      10-     99 CONTIGUOUS SECTORS =      944 FREE SECTORS.  0%
   17 BLOCK(S) OF     100-    999 CONTIGUOUS SECTORS =     5328 FREE SECTORS.  0%
    3 BLOCK(S) OF    1000-   9999 CONTIGUOUS SECTORS =     8800 FREE SECTORS.  1%
    2 BLOCK(S) OF   10000- 99999 CONTIGUOUS SECTORS =    46816 FREE SECTORS.  4%
    1 BLOCK(S) OF 100000-AND UP CONTIGUOUS SECTORS =  1115936 FREE SECTORS. 95%
```

To free disk space by creating a tape

If there is not enough free space on the disks, you create space as follows. Create a tape of the existing spoolfiles and delete the spoolfiles from the system.

1. Enter:

   <u>FILE BACKUP;DEV=TAPE</u> (Return)

   <u>STORE @;OUT.HPSPOOL;*BACKUP;PURGE;SHOW</u> (Return)

   `FILE BACKUP;DEV=TAPE` defines a file named "BACKUP" in class "TAPE". `STORE @.@` outputs files for all users and accounts, and `PURGE` removes the spoolfiles from the system once each has been copied to the tape.

2. Mount the tape and reply to the tape request.

   The system displays the data for each file as it is written to the tape:

   ```
   #FILE   #JOB   DEV/CL   SECTORS   OWNER

   #0379   #J9    LP           100   MANAGER.SALES
   #0451   #J2    LP            40   MANAGER.SALES
   #0453   #J3    LP            40   MANAGER.SALES
   #0454   #J4    LP            40   MANAGER.SALES
   #0455   #J5    LP            40   MANAGER.SALES
   #0456   #J6    LP           144   MGR.TEMPACCT
   ```

3. Verify that all files were purged from the system by entering:
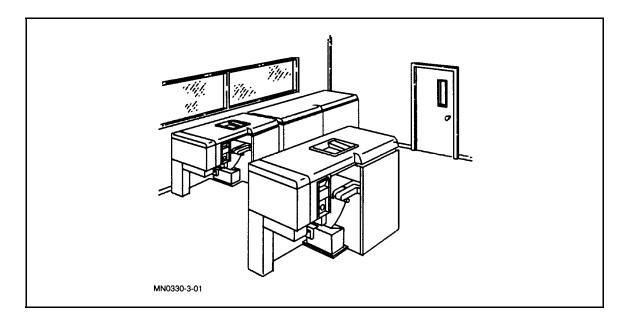
   <u>LISTSPF @</u> (Return)

   If no spoolfiles are listed, all the files were purged. Remove the tape from the tape drive and label it.

3

Managing Printers

As a system operator, you are responsible for the operation of system printers, including adding paper, fixing paper jams, and maintaining the printer.

You may be responsible for printers designed for shared or personal use. The most common printers are shown below:

MN0330-3-01

In this chapter, you will find the procedures to perform the following tasks:
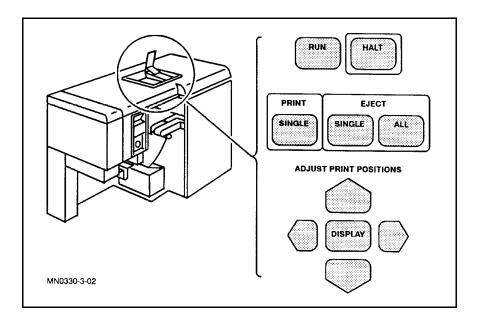
- Identifying page printers.

- Starting and stopping the printer.

- Loading and adjusting the paper.

- Removing the reports from the printer.

- Sorting and distributing the reports.

Identifying Page Printers

You control most page printers by using the (RUN) or (HALT) keys. This allows you to start or stop the printing process without turning off the power.

If you are using a printer that is not manufactured by Hewlett-Packard, consult the operator's manual to find out how to start and stop the printing process.

To operate a page printer, you should be familiar with the page printer control panel. The following illustration displays the printer control panel.

MN0330-3-02

The following table describes the most commonly used page printer functions.

Table 3-1.

Controls	Description
Front ON/OFF Switch	The operator's ON/OFF switch. Located near the paper splicing table, this switch controls AC power throughout the printer.
LED Display	The front panel LED display provides a visual indication of the operational status of the tape drive. The LED display consists of one red, one green, and one yellow LED.
RUN Indicator	The RUN indicator lights up when the printer is either waiting for or printing data.
RUN Key	When the (RUN) key is pressed, the printer accepts data transmitted from the computer and the WARMING UP message is displayed until the printer is ready.
HALT Key	When the (HALT) key is pressed, the halt sequence begins and the printer stops printing data after the current page has been printed.
ADJUST PRINT/ POSITION Keys	The four keys are used to adjust the position of the print on the paper. Press the key that points in the direction you wish to move the print. Each time you press the key, the image moves 0.28 inches. If you press and hold the key, multiple incremental movements occur.
PRINT SINGLE Key	When the (PRINT SINGLE) key is pressed, a single page is printed. Repeated pressing of the (PRINT SINGLE) key cause a corresponding number of pages to be printed. The printer returns to a HALT condition after the last page is printed.
EJECT SINGLE Key	When the (EJECT SINGLE) key is pressed, the paper is advanced one page length. The fuser is active; therefore, paper advanced with this key provides permanent printed output.
EJECT ALL Key	When the (EJECT ALL) key is pressed, all unfused pages are removed through the fuser and into the stacker.
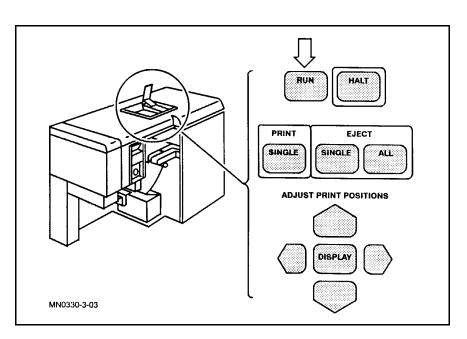
For a description of all the controls and indicators on your page printer, refer to your "printer" handbook.

Starting and Stopping a Page Printer
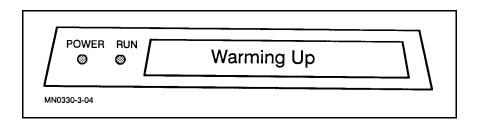
The page printer provides excellent print quality at high rates of speed. The function keys are simple to use. When starting the printer, you press the RUN function key and the printer accepts data transmitted from the computer. When stopping the printer, you press the HALT function key. The halt sequence begins and the printer stops printing data after the current page has been printed.

To start a page printer

Press the RUN key.

MN0330-3-03

The WARMING UP message is displayed until the printer is ready.

MN0330-3-04
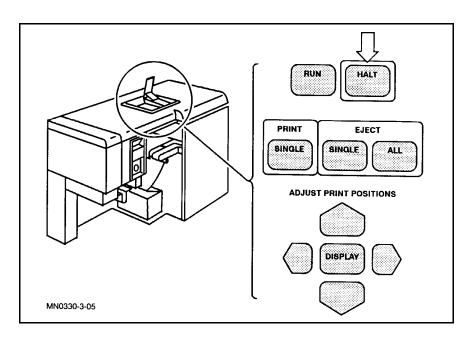
To stop a page printer   Press the HALT key.

MN0330-3-05
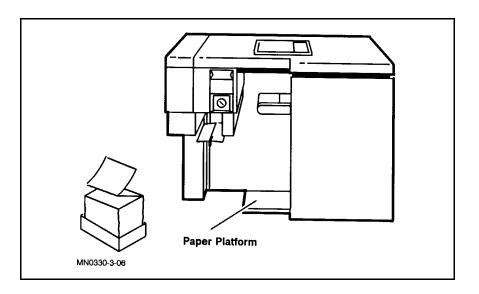
The printer stops printing after the current page has been printed.

Loading and Adjusting Paper for a Page Printer

Whenever you load and adjust the paper, the page printer must be in HALT mode with the front door closed and the power on.

To prepare the paper for loading
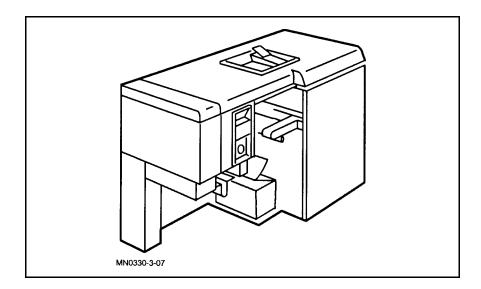
Remove the paper from its container before placing it on the paper tray.

Paper Platform

MN0330-3-06
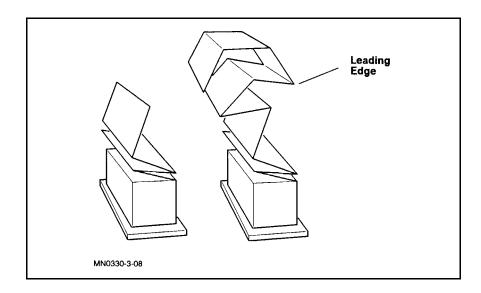
If you find this awkward, the container can be placed on the tray and cut away, leaving the paper.

To load and adjust paper for a page printer
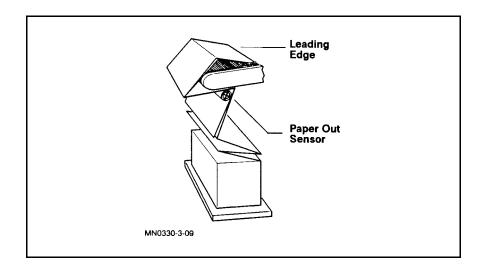
1. Position the paper on the tray beneath the splice table. The paper should be positioned directly under the table and parallel to the input tractors.

MN0330-3-07

2. Fold approximately two feet of paper. Ensure that the leading edge of the paper retains the original folding pattern.

Leading Edge

MN0330-3-08
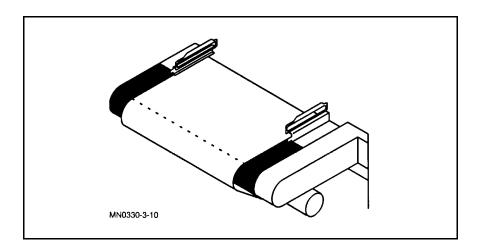
3. Thread paper around the paper out sensor assembly and place the leading edge on the splice table.

MN0330-3-09
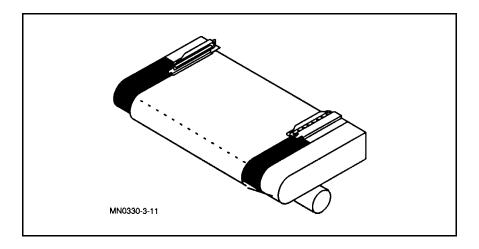
The folded sheets will be used later in threading paper through the preheater.

4. Open the input paper tractors. Note that the front tractor is fixed, while the rear tractor is adjustable.

MN0330-3-10
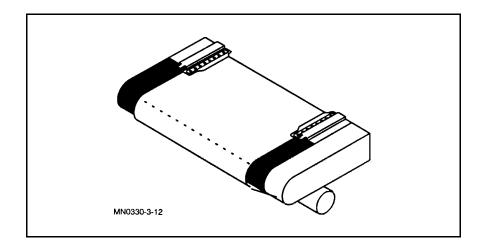
5. Align the leading edge of the paper and close the front tractor.

MN0330-3-11
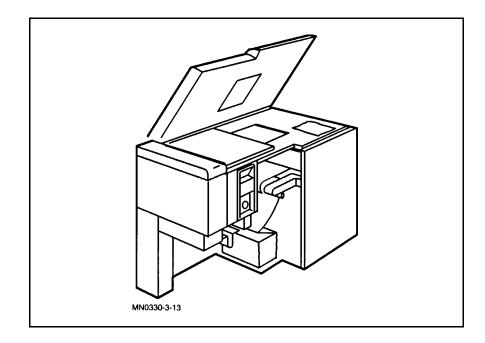
Ensure that the leading paper tractor hole is aligned with the leading pin on the input tractor. Adjust the rear tractor to match the paper width.
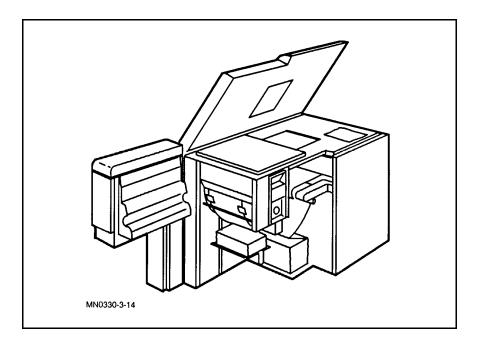
6. Clamp and close the rear tractor.

MN0330-3-12

7. Open the printer top cover, exposing the paper path and the preheater areas.

MN0330-3-13
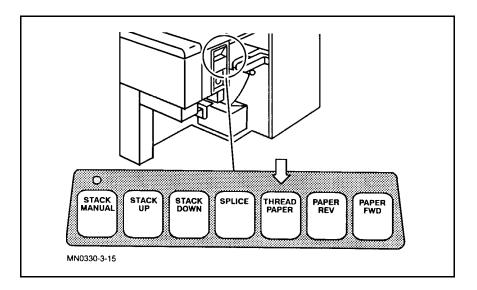
8. Open the paper output door. The door latch is located underneath the front left-hand corner of the printer.

MN0330-3-14
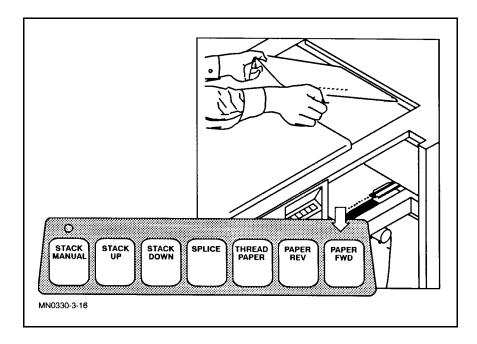
To thread the paper
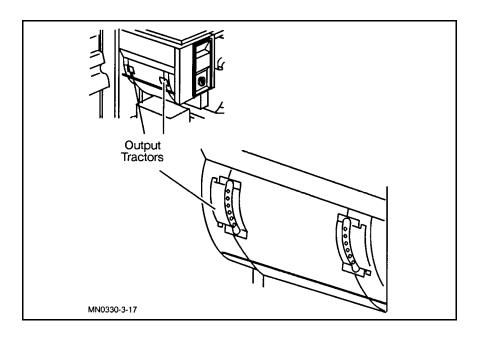
1. Press and hold the (THREAD PAPER) key on the paper control panel until the paper emerges.

MN0330-3-15

2. Using one hand, grasp the edge of the paper. Apply slight tension to the paper while pressing the (PAPER FORWARD) key.

MN0330-3-16
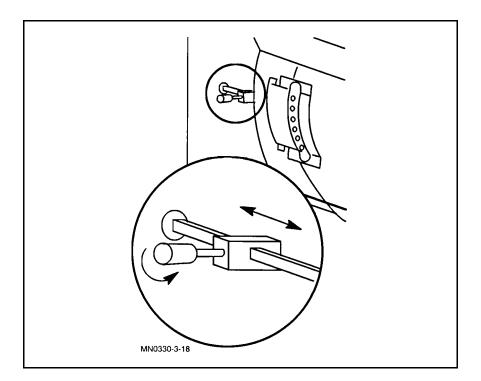
3. Adjust the output tractors to the paper width.

Output Tractors

MN0330-3-17
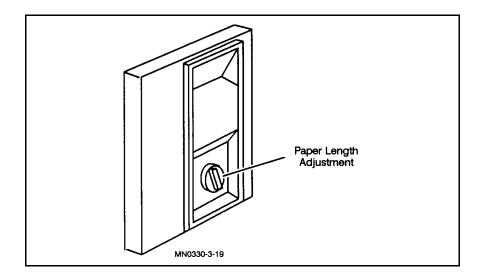
The right tractor is fixed and cannot be adjusted.

4. Move the left tractor by rotating the tractor clamp release knob.

MN0330-3-18
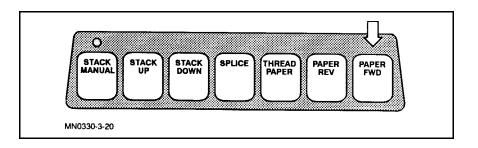
If the adjustment knob is located to the rear of the tractor and is difficult to grasp, manually rotate the tractor until the adjustment knob is in front.
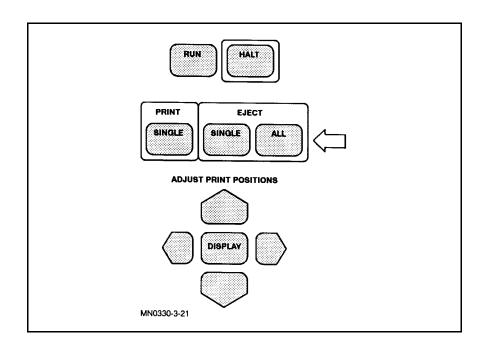
5. Set the Paper Length Adjustment selector, located below the paper control panel, to correspond to the page length of the paper.

6. Use the (PAPER FORWARD) key to move the paper through the output tractors into the stacker.
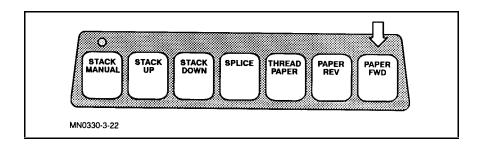
7. Close the paper output door. Make sure the latch is secure.

8. Use either the (EJECT ALL) key or the (PRINT SINGLE) key, if data is available on your printer.

MN0330-3-21

To align the paper   Once the paper is loaded, align the page perforations to the corresponding page length.

1. Use the (PAPER FORWARD) key to move paper perforations to the correct page length alignment mark.

MN0330-3-22

The (PAPER FORWARD) key is the only key that may be used since it moves the paper in one-half inch increments. The (PAPER REVERSE) key cannot be used for this alignment.

2. Press the (RUN) key to start printing.
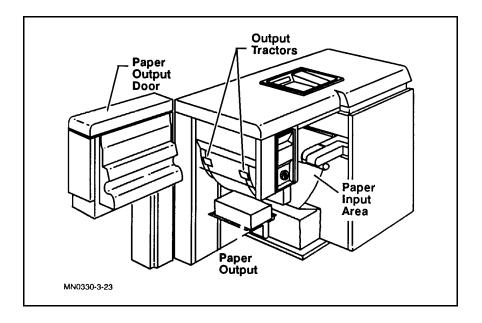
Clearing Paper Jams in a Page Printer

The page printer is designed to retain print information in memory until it has successfully printed and transferred to paper. If you have a paper jam before the above process has completed, the pages will reprint, without interaction from the host computer, after clearing the jam.
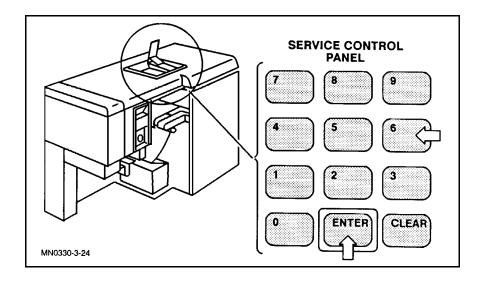
To clear paper jams in a page printer

When a paper jam occurs, it usually happens in one of the following areas of the printer:

- Input area
- Output area

MN0330-3-23

If the carrier strip holes are not torn, you may move the jam through the input tractors by pressing the ⑥ and ⌈ENTER⌋ keys. This places the printer in Jam Recovery Mode.

SERVICE CONTROL
PANEL

MN0330-3-24
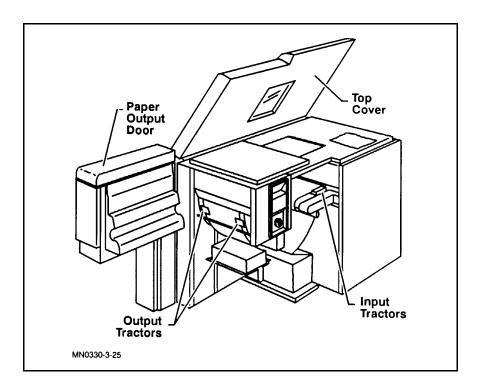
If the carrier strip holes are torn, press the (PAPER REVERSE) key on the Paper Control Panel to pull the paper backward through the printer.
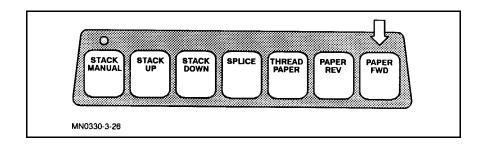
Determine the location of the paper jam and follow the procedures below.

To clear a paper jam in the input area
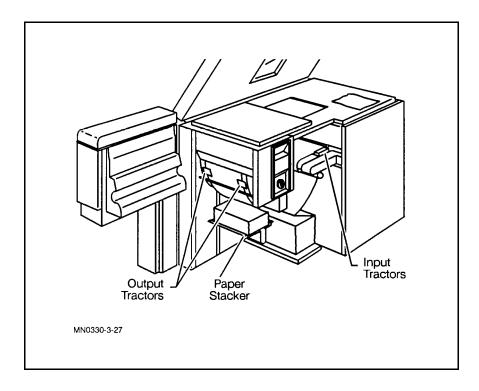
1. Open the paper input tractors. Open the paper output door and remove the paper from the output tractors. Ensure that the paper is not caught on either set of tractors.

Paper
Output
Door

Top
Cover

Output
Tractors

Input
Tractors

MN0330-3-25

2. While maintaining tension on the paper from the output tractor, press the (PAPER FORWARD) key to move paper through the printer until the paper jam is cleared.

MN0330-3-26

3. Reposition the paper in the paper tractors and the stacker.

Output Tractors   Paper Stacker   Input Tractors

MN0330-3-27
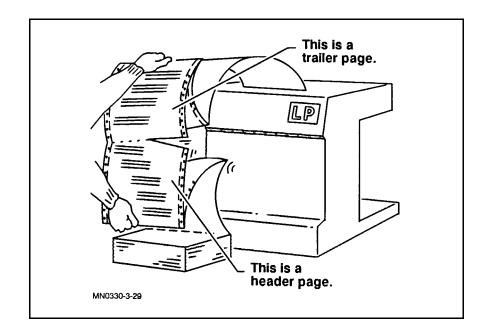
4. Close all doors and top cover and press the (RUN) key to resume printing.

To clear a paper jam in the output area

1. Open the paper output door.

2. Open the output tractors and remove the paper from the pinwheels. While pulling on the paper just removed, use the $\boxed{\text{PAPER FORWARD}}$ key to move the jam through the printer.

3. Reposition the paper in the output tractors and close the paper output door. Make sure that the paper is folded correctly in the stacker.

4. Press the $\boxed{\text{RUN}}$ key to resume printing.
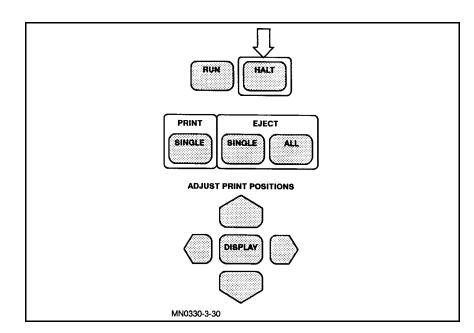
Removing the Report from a Page Printer

Header and trailer pages help you identify your report by telling you the day, date, and time the report was printed, and the computer identity of the person who sent the report to the printer.

MN0330-3-29
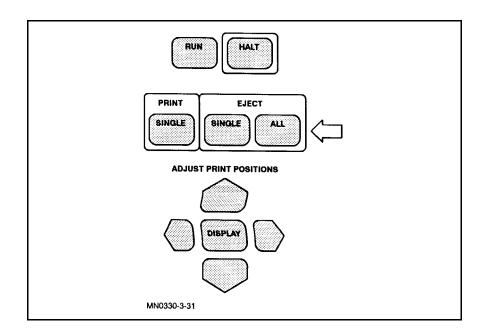
The default condition for printing header and trailer pages is ON. The commands are HEADON and HEADOFF.

To tear a report off the page printer

1. Stop the printer by pressing the HALT button.

MN0330-3-30

2. Then press the EJECT ALL button.

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If you stopped the printer before it began printing another report, one or more blank pages are fed through the printer until the last page of the printed report clears the paper feeder.

3. Find the trailer page and tear the report at the perforation.

This is a trailer page.

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4. Press the (RUN) key to restart your printer.

Sorting and Distributing the Reports

The simplest method to sort the reports is alphabetically, using the first letter of the account name.
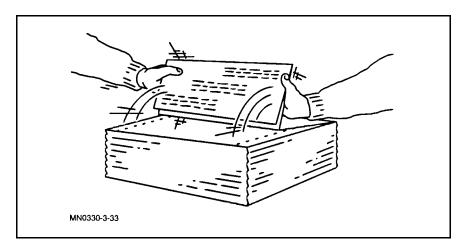
For example, if the user's logon is:

NICOLE.DOE

Sort the report in the shelf labeled D. (DOE is the account name.)

To sort and distribute reports
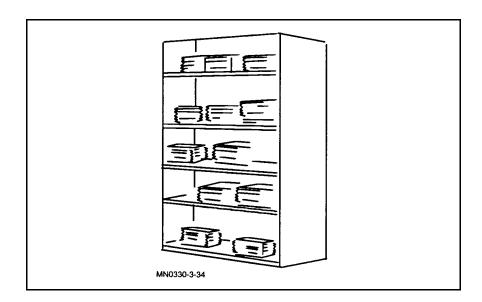
1. Fold back the top of the page to expose header information.

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If the HEADON command is enabled each report begins with a header page and ends with a trailer page. Using these as a guide, separate the reports.

2. Separate the reports into alphabetical groupings and stack them on clearly labeled shelves or in bins near your computer room.

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4

Managing Printer Activity

Everyone using the computer usually shares printers. Your computer may have more than one printer, but it is unlikely users have their own. It is also true that users cannot truly share a printer without someone, or something, managing it: you would not want part of your report printed on the same page with part of another person's report. For this reason, a printer *spooler* is used to manage the smooth flow of reports to and from your printer. It performs the following tasks:

- Acts on data written to a spooled printer by collecting all of the information needed to print a report and storing it in a special file called a *spoolfile*.

- Keeps reports separate and keeps track of when each was submitted for printing, who submitted the report, and other information.

- Supervises the orderly printing of all eligible reports and keeps track of the others.

The spooler does all of the above tasks on its own. It even gives the appearance that each user has exclusive use of the printer. You are aware of the spooler only when you want an overview of the printing process, if you are interested in the status of a specific report, or when you need to intervene and manage the printer yourself.

In this chapter, you will find the procedures to perform the following tasks:

- Altering printer access.

- Altering printer files.

- Controlling printer activity.

- Starting and stopping spooled printing.

Altering Printer Access

Every output spoolfile is assigned an *outputpriority*, from 0 to 13. This is the value of the *outpri* parameter on the DEV parameter of MPE/iX commands such as FILE and SPOOLF. The OUTFENCE command sets an outputpriority limit (fence) over which files with equal or lower print priorities cannot pass. The output spoolfile does not print unless its outputpriority is higher than the outfence set by the OUTFENCE command. The outfence is usually set to a default value of 14 on all system startups to prevent printing until the system is ready. When ready the output priority is often set to 7 and User files are given a default outputpriority of 8.

To check your print priority

Enter:

LISTSPF (Return)

The screen displays the outfence in the lower left corner:

```
SPOOLID     JOBNUM    FILEDES   PRI COPIES DEV   STATE   RSPFN OWNER


#055        S16       PRNT       8      1 LP     READY         SM.MANAGER
#056        J31       $STDLIST   8      1 LP     SPSAVE  S     SM.MANAGER


INPUT SPOOL FILES               OUTPUT SPOOL FILES
ACTIVE   = 0;                   CREATE   = 0;        READY    = 1;
OPEN     = 0;                   DEFER    = 0;        SELECTED = 0;
READY    = 0;                   DELPND   = 0;        SPSAVE   = 1;
                                PRINT    = 0;        XFER     = 0;
                                PROBLM   = 0;


TOTAL IN FILES   = 0;           TOTAL OUT FILES  =  2;
    IN SECTORS   = 0;               OUT SECTORS  = 32;


OUTFENCE = 14
```

If you have more than one printer, individual outfences may be set for each one. The OUTFENCE command can be executed only from the system console, unless allowed to other users by the ALLOW command. All spoolfiles are displayed when entering LISTSPF at the console.

To set the print priority

If the output priority is less than or equal to the outfence, the report does not print until the outfence is lowered or the report's priority is raised.

To print reports assigned low output priorities, you can lower the outfence. At the system console, change the outfence to 6 for all devices by entering the following command:

OUTFENCE 6

Check it by entering:

LISTSPF

The screen displays:

```
SPOOLID     JOBNUM   FILEDES   PRI COPIES DEV   STATE   RSPFN OWNER

#055        S16      PRNT       5      1 LP     PRINT         SM.MANAGER
#056        J31      $STDLIST   8      1 LP     SPSAVE  S     SM.MANAGER

INPUT SPOOL FILES              OUTPUT SPOOL FILES
ACTIVE   = 0;                  CREATE   = 0;        READY    = 0;
OPEN     = 0;                  DEFER    = 0;        SELECTED = 0;
READY    = 0;                  DELPND   = 0;        SPSAVE   = 1;
                               PRINT    = 1;        XFER     = 0;
                               PROBLM   = 0;


TOTAL IN FILES   = 0;          TOTAL OUT FILES   =  2;
    IN SECTORS   = 0;              OUT SECTORS   = 32;


OUTFENCE = 6
```

To raise the print priority

To raise the system's outfence, use the `OUTFENCE` command with a value higher than the existing value. For example, to raise the outfence higher than 6, enter:

<u>OUTFENCE 7</u>

Check it by entering:

<u>LISTSPF</u>

The screen displays:

```
SPOOLID   JOBNUM   FILEDES  PRI COPIES DEV      STATE   RSPFN OWNER

#055      S16      PRNT      5     1 LP       PRINT         SM.MANAGER
#056      J31      $STDLIST  8     1 LP       SPSAVE  S     SM.MANAGER

INPUT SPOOL FILES              OUTPUT SPOOL FILES
ACTIVE   = 0;                  CREATE   = 0;        READY    = 1;
OPEN     = 0;                  DEFER    = 0;        SELECTED = 0;
READY    = 0;                  DELPND   = 0;        SPSAVE   = 1;
                               PRINT    = 1;        XFER     = 5;
                               PROBLM   = 0;


TOTAL IN FILES   = 0;          TOTAL OUT FILES   =  2;
     IN SECTORS = 0;                 OUT SECTORS = 32;


OUTFENCE = 7
```

If a report is in progress when the outfence is raised it is allowed to finish.

To prevent printing all reports Raising the outfence to its maximum value, 14, prevents the printing of all reports. To raise the print priority, enter:

OUTFENCE 14

Check it by entering:

LISTSPF

The screen displays:

```
SPOOLID     JOBNUM   FILEDES   PRI COPIES DEV     STATE   RSPFN OWNER

#055        S16      PRNT      8      1 LP       READY         SM.MANAGER
#056        J31      $STDLIST  8      1 LP       SPSAVE  S     SM.MANAGER

INPUT SPOOL FILES             OUTPUT SPOOL FILES
ACTIVE   = 0;                 CREATE   = 0;        READY    = 1;
OPEN     = 0;                 DEFER    = 0;        SELECTED = 0;
READY    = 0;                 DELPND   = 0;        SPSAVE   = 1;
                             PRINT    = 0;        XFER     = 0;
                             PROBLEM  = 0;


TOTAL IN FILES   = 0;         TOTAL OUT FILES   =  2;
     IN SECTORS  = 0;             OUT SECTORS   = 32;

OUTFENCE = 14
```

Altering Print Files

The `ALTER` option of the `SPOOLF` command is used to alter the characteristics of a print file, known as a spoolfile. You can use this command to defer printing to a later time, to change priority to print sooner, to send the file to a different printer, or to print additional copies. You cannot use this command for private files.

To obtain information about multiple spoolfiles

Use the `LISTSPF` command to obtain information about multiple spoolfiles. For example:

    LISTSPF @

The screen displays:

```
SPOOLID     JOBNUM    FILEDES   PRI COPIES DEV     STATE    RSPFN OWNER


#055        S16       PRNT      6      1 LP        READY          SM.MANAGER
#056        J31       $STDLIST  8      1 LP        SPSAVE   S     SM.MANAGER


INPUT SPOOL FILES                OUTPUT SPOOL FILES
ACTIVE   = 0;                    CREATE   = 0;        READY    = 1;
OPEN     = 0;                    DEFER    = 0;        SELECTED = 0;
READY    = 0;                    DELPND   = 0;        SPSAVE   = 1;
                                 PRINT    = 0;        XFER     = 0;
                                 PROBLM   = 0;


TOTAL IN FILES   = 0;            TOTAL OUT FILES   =  2;
    IN SECTORS   = 0;                OUT SECTORS   = 32;


OUTFENCE = 7
```

To alter the print device

Use the `SPOOLF` command with the appropriate identifiers and the `ALTER` option. Alter the print device to device class `LP2` for three spoolfiles by entering:

    SPOOLF IDNAME=357,375,458;ALTER;DEV=LP2

By grouping multiple *idnames* within parentheses, you may omit the `IDNAME=` keyword.

To omit `IDNAME=`, enter:

    SPOOLF (357,375,458);ALTER;DEV=LP2

You may specify a device class, as in the example, or you may specify a logical device number or device name.

To print more than one copy

Use the `ALTER` option to print more than one copy of a spoolfile for example, with a spoolfile identification of #O14, enter:

```
SPOOLF #014;ALTER;COPIES=2 [Return]
```

To ask for a list of unprinted reports

To ask for a list of unprinted reports, use the `LISTSPF` command. You can use this command to obtain information by spoolfile identifier (SPOOLID) for specific output spoolfiles. For example:

```
LISTSPF IDNAME=O357
```

You may omit the keyword `IDNAME=` and the letter `O`:

```
LISTSPF 357
```

If you have more than one SPOOLID, you may string them as follows:

```
LISTSPF IDNAME=357,375,458
```

By grouping multiple *idnames* within parentheses, you may omit the `IDNAME=` keyword:

```
LISTSPF (357,375,458)
```

To delete all output spoolfiles

The `;DELETE` option of the `SPOOLF` command allows you to delete linked spoolfiles. A linked spoolfile prints according to its output priority.

You may use the wildcard symbol in `IDNAME` to specify all output spoolfiles. For example:

```
SPOOLF IDNAME=O@;DELETE;SHOW
```

or

```
SPOOLF O@;DELETE;SHOW
```

Caution

`SPOOLF O@;DELETE` is a powerful command because it deletes all spoolfiles to which you have access. For example, if you have SM or OP capability, it deletes all output spoolfiles that are not in a `CREATE` state. To delete particular spoolfiles, you can use the `SELEQ` option as described later in this chapter.

To delete one or more spoolfiles

Enter:

```
SPOOLF (357,375,458);DELETE;SHOW
```

If you are using SPOOLF to delete input spoolfiles you must use the format I*nnn* for the spoolfile identification. Only input data files may be deleted with the SPOOLF command.

Also, $STDIN input spoolfiles cannot be deleted with the SPOOLF command. These files can be deleted only be issuing an ABORTJOB command against the job number to which the $STDIN is associated. Under normal circumstances, you seldom need to do this because the system deletes $STDIN spoolfiles when their associated job terminates.

To use a selection equation to delete spoolfiles

The selection equation is used as a filter on the set of spoolfiles selected. Only spoolfiles whose attributes satisfy all filter requirements are listed. Use selection equations with the DELETE and ALTER options. Enter:

```
SPOOLF O@;DELETE;SELEQ=[PRI<8]
```

You may put your selection equation in an *indirect* file. An indirect file specifies the name of a file containing the selection equation. It must be preceded by a caret (^). The selection equation contained in the file may not exceed 277 characters in length, including the brackets in which it must reside.

Controlling Printer Activity

You may use the `SPOOLER` command to start, suspend, resume and stop spooler processes, and release spoolfiles from a spooler process. The `SPOOLER` command may be entered only at the console unless enabled to other users with the `ALLOW` or `ASSOCIATE` commands.

To start the spooler

Entering the `START` parameter with an *ldev* parameter opens the spool queue for the specified device and starts a spooler process for only that device. The use of `SPOOLER;DEV=nn;START` allows spoolfiles targeted for that device and any device class name that contains that device to print. To start a spooler process for each device in *devclass* LP, enter:

    SPOOLER DEV=LP;START

Or, because `DEV=` is optional, enter:

    SPOOLER LP;START

To suspend spooling

The `SUSPEND` parameter within the `SPOOLER` command temporarily suspends the spooler process. The spooled device remains spooled and the queue maintains its current status (open or shut). To suspend printing, enter:

    SPOOLER 6;SUSPEND

To suspend spooling but let current spoolfile finish

When a spooler is suspended, spoolfiles may continue to be created but the spooler process does not continue to print files. To suspend spooling but allow a current spoolfile to finish printing, enter:

    SPOOLER 6;SUSPEND;FINISH

To reprint a specified number of pages

The - option of the `OFFSET` parameter indicates that the offset is backward rather than forward. In the example below, printing would resume three pages back from the last page printed, unless the offset is further adjusted with the `;RESUME` or `;RELEASE` options. To reprint three pages, enter:

    SPOOLER 6;SUSPEND;OFFSET=-3

To move ahead a certain number of pages

The + option of the `OFFSET` parameter indicates that the offset is forward. In the example below, printing would resume five pages forward, unless the offset is further adjusted with the `;RESUME` or `;RELEASE` options. To move ahead from the last page printed, enter:

    SPOOLER 6;SUSPEND;OFFSET=+5

To begin printing on a specified page

The absence of a **+** or **-** indicates an absolute offset from the beginning of the spoolfile.

To begin printing on a specified page, enter:

    SPOOLER 6;SUSPEND;OFFSET=7

If ;OFFSET is not specified, printing resumes at the page where it was stopped. This is also the default.

To print a spoolfile at its beginning

It is important to understand that pages are defined only for control of intelligent peripherals (CIPER) protocol devices and HP 2680 and HP 2688 page printers. For these devices, a page is one physical sheet. Pages are not defined for other devices, and the results of using the ;OFFSET parameter are unpredictable for them. To print a spoolfile from the beginning, enter:

    SPOOLER 6;SUSPEND;OFFSET=1

To suspend spooling immediately

The combination of the NOW, KEEP, and zero OFFSET parameters (all defaults) is a unique situation. When the spooler receives this form of the SUSPEND option, it suspends after processing the current record. To suspend printing immediately, enter:

    SPOOLER 6;SUSPEND;NOW

Because ;NOW is the default, it may be omitted.

To resume spooling

Use the ;RESUME option of the SPOOLER command to restart the spooler process. If the spooler process retained a spoolfile while it was suspended, you can specify where to restart the printing. To resume printing, enter:

    SPOOLER 6;RESUME

To resume printing at the beginning of the spoolfile

Use the OFFSET parameter of the SPOOLER command to resume printing at the beginning of a spoolfile:

    SPOOLER 6;RESUME;OFFSET=1

To resume printing on a particular page

If you know the page number of the spoolfile that you want to start on (for example, page 7), enter:

    SPOOLER 6;RESUME;OFFSET=7

To resume and reprint a certain number of pages

Use the - option of the `OFFSET` parameter to back up a certain number of pages:

```
SPOOLER 6;RESUME;OFFSET=-4
```

To resume and move ahead a certain number of pages

Use the + option of the `OFFSET` parameter to move ahead to certain pages:

```
SPOOLER 6;RESUME;OFFSET=+4
```

The plus sign means advance four pages from where it is now. Without the plus sign, it means page number 4.

To stop a spooler process

Use the `STOP` option of the `SPOOLER` command to stop a spooler process. For example:

```
SPOOLER 6;STOP
```

This command also closes the spooling queues for logical device 6.

To stop the spooler process but leave spooling queues open

Use the `OPENQ` option to stop the spooler and leave the spooling queues open. For example:

```
SPOOLER 6;OPENQ;STOP
```

Deferring the Printing of a Report

The `;DEFER` option of the `SPOOLF` command changes the spoolfile's state to `DEFER`. If the spoolfile is currently in the `PRINT` state, its spooler is notified and printing stops at that point. The spoolfile's priority remains unchanged. If this option is used with the `PRINT` option, the spoolfile is copied to `OUT.HPSPOOL` and is linked to the spooling system, but the state of the spoolfile is `DEFER`. The spoolfile is not printed until a subsequent `SPOOLF ... ;UNDEFER` is entered.

If the `;DEFER` option is used on any file in the `CREATE` state, the spoolfile enters the `DEFER` state only after it is completed (closed for the last time).

To defer printing a report

Using the `DEFER` option of the `SPOOLF` command allows you to defer a spoolfile without altering its original outputpriority value. When spoolfiles are undeferred they retain the user-specified outputpriority. To defer printing a report, enter:

```
SPOOLF 357;DEFER
```

To defer one or more spoolfiles

To defer several spoolfiles, use the DEFER parameter. For example:

    SPOOLF (357,375,458);DEFER

To change a report from deferred to ready state

Use the UNDEFER option to change a report from the DEFER state to the READY state. For example:

    SPOOLF 357;UNDEFER

Opening and Closing the Spool Queue

In addition to being the parameters for the SPOOLER command, OPENQ and SHUTQ are themselves commands. You may use the OPENQ command to open the spooling queue and the SHUTQ command to close the spooling queue, or use the OPENQ and SHUTQ options with the SPOOLER command.

To display information about the state of the queues and devices

Use the ;SHOW option of the OPENQ command to see information about the state of the queues and devices. The ;SHOW option cannot be used if the @ option is used with OPENQ and SHUTQ.

Enter:

    OPENQ LP;SHOW

The OPENQ command opens the spooling queue for each device and makes it possible for users to create spoolfiles. It does not enable you to print spoolfiles. The OPENQ command may be entered only from the system console unless enabled to other users with the ALLOW or ASSOCIATE commands. Before spoolfiles can print, you must start the spooler, by opening the spooling queues.

To open spooling queues

Open spooling queues which were open at the time of the last SHUTQ, enter:

    OPENQ @

The above command does not open all spooling queues on the system. You can think of OPENQ @ as a global enabling of all device queues which are already open.

To open spooling queues for all devices in class LP

Open spooling queues for all devices class in LP by entering:

    OPENQ LP

To close spooling queue while starting the spooler process

Use the `SHUTQ` option of the `SPOOLER` command to close the spooling queue and start the spooler process. For example:

```
SPOOLER LP;START;SHUTQ
```

The `SHUTQ` command prohibits anyone from creating new spoolfiles but has no effect on spoolfiles that have already been opened. It does not prevent spoolfiles from printing. To do that, you must stop or suspend the spooler.

The `SHUTQ` and `SPOOLER` commands may be entered only from the system console unless enabled to other users with the `ALLOW` or `ASSOCIATE` commands.

To close spooling queues for all devices in class LP

Close spooling queues for all devices in class LP by entering:

```
SHUTQ LP
```

To clear a backlog of spooled reports

If the device is not owned by a spooler process so that spoolfiles can be printed, enter:

```
SPOOLER DEV=nn;START;SHUTQ;SHOW (Return)
```

Replace *nn* with your printer's LDEV number.

When the spooler is started, the computer sends you this message:

```
16:45/54/SP#nn/OUTPUT SPOOLER, LDEV #nn: STARTED
```

nn is your printer's LDEV number.

If you would like to check the status of each printer after you have brought it back up and started a spooler process for it, use the `SPOOLER` command. Enter:

```
SPOOLER 6;SHOW (Return)
```

You see the following on your screen:

```
LDEV   DEV        SPSTATE   QSTATE   OWNERSHIP      SPOOLID

   6   00000006   START     OPENED   OUT SPOOLER
```

Lower the outfence to 1 so that any report assigned an output priority of 2 or higher can be printed. Enter:

```
OUTFENCE 1 (Return)
```

Check the list periodically to find out how many spoolfiles remain by entering:

```
LISTSPF @ (Return)
```

If some of the reports have been assigned the lowest priority, decide whether or not you want to print them. When the computer tells you that there are "NO QUALIFIED SPOOLFILE(S)," they have all been printed.

To copy an output spoolfile from OUT.HPSPOOL to your account

If you want to save an output spoolfile in your account, you may do so by copying the file from the group OUT.HPSPOOL into your account, using the COPY or FCOPY command. Enter:

```
COPY FROM=Onnnn.OUT.HPSPOOL;TO=outspfile
```

O*nnnn* is the output spoolfile name (LISTSPF displays it), and *outspfile* is the name you give the local copy of the spoolfile.

Directories cannot be copied using the COPY command. If the *sourcefile* or *targetfile* is actually a directory, an error is returned.

To store all output spoolfiles to tape

You may use the STORE and RESTORE commands to copy spoolfiles to and from tape. It is recommended that you use these commands to move spoolfiles from one system to another so long as both systems have the native mode spooler.

Enter:

```
FILE T;DEV=TAPE
STORE @.OUT.HPSPOOL;*T;SHOW
```

The ;SHOW parameter produces a listing of files stored. You may enter ;SHOW=OFFLINE for an offline listing.

To restore all output spoolfiles to your system

Enter:

```
FILE T;DEV=TAPE
RESTORE *T;@.OUT.HPSPOOL;SHOW
```

Input spoolfiles are private and private spoolfiles cannot be stored. However, because input spoolfiles are used and managed by the system, there is seldom any reason to store them to tape or move them to another system.
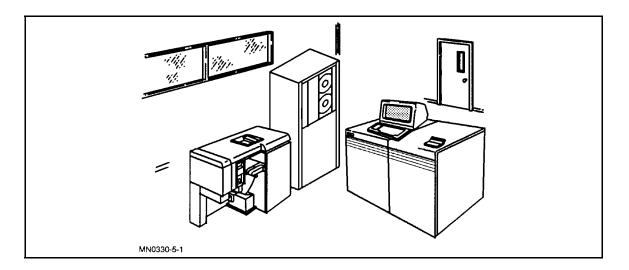
Note   Spool files created for printing either on the HP 5000 or on an HP
2680 page printer have been modified for the current release of the
operating system. If you have created a spool file on a system that
has Release 5.0 of MPE/iX, and you restore it to a system with
Release 4.5 or earlier, you cannot print the file correctly on the HP
5000 unless you have the FXR1 patch installed. For information,
contact the Response Center.

5

Performing System Functions

As a system operator you are responsible for performing tasks that monitor system activity. These tasks include managing the console, communicating with your users, and managing activities for jobs and sessions.

The system console, also referred to as the console, is a terminal connected to your computer. It responds to a special set of commands that are not available on other terminals. By using these commands, you can get a comprehensive picture of all system activity.

A session is a two-way dialog between a user and the computer. The computer interprets and follows the commands you enter at the keyboard, if it can. If it cannot, it uses an error message to tell you that something is wrong. A job is a sequence of instructions given to the computer to process. When you store this information in a *job file*, and then execute it, you create a job.

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In this chapter, you learn to perform the following tasks:

- Communicating with the users
- Managing session activity
- Managing job activity
- Removing devices from system use
- Managing directories
- Getting online help with MPE/iX commands and error messages

Performing Console Tasks

The system console, also referred to as the console, is a terminal connected to your computer. It responds to a special set of commands that other terminals cannot interpret. By using these commands, you can get a comprehensive picture of all system activity.

To identify the console

The console is usually logical device LDEV 20, though it can be moved to another LDEV. To determine the current location of the console, enter:

```
CONSOLE
```

The computer responds:

```
CONSOLE IS LDEV 20
```

To log on to the console

To log onto the console, type the following at the MPE XL prompt:

```
HELLO OPERATOR.SYS
```

When the system prompt, usually a colon (:), appears on the left side of the screen, you have successfully started a session as OPERATOR.SYS. The system asks you to enter one or more passwords. Once you do so, the session begins.

Caution

When you begin using the console, you can treat it the same way you do a standard terminal, with one exception: *Do not turn the console off*!

To assign or change your password

Use the PASSWORD command to assign your own password or to change the existing password. You use this command interactively; it prompts you for required input. For example:

```
PASSWORD
```

The system responds:

```
ENTER OLD USER PASSWORD:
ENTER NEW USER PASSWORD:
ENTER NEW PASSWORD AGAIN:

PASSWORD WAS CHANGED SUCCESSFULLY.
```

To list OPERATOR.SYS capabilities

Besides password information, you should find out what capabilities OPERATOR.SYS has, which determines the kinds of things you can do with the computer. For example, if you are not assigned save files (SF) capability, you cannot save information in a computer file.

To list the capabilities of OPERATOR.SYS, enter:

    LISTUSER OPERATOR;FORMAT;DETAIL

The computer describes OPERATOR.SYS with by displaying information in the following form. The capabilities appear on the bottom line. (Yours may be different than this example.)

```
*******************************************************

USER       : OPERATOR.SYS
PASSWORD   : **
UID        : ##
GID        : ##
MAX PRI    : 150
LOC ATTR   : $00000000
LOGON CNT  : 1
HOME DIR   : /UI/DEVELOP
LOGON CI   : /SYS/PUB/CI
CAP        : AM,AL,GL,OP,PS,ND,SF,BA,IA
```

Using the Console Commands

The console is the only terminal from which you can execute a special subset of commands, called *console commands*. They are used for two purposes:

- To allow you to communicate with the computer when you cannot get the normal system prompt.

- To perform specific tasks that affect the entire computer system, such as stopping all jobs and sessions and shutting down the computer.

The console commands are listed below.

- LOGON

- LOGOFF

- SHUTDOWN

- RECALL

- REPLY

- ABORTIO

To issue any of the console commands, you first generate the control-A (=) prompt. To do so, hold down the (CTRL) key and press (A). The control-A (=) prompt is displayed on your screen. The commands you have been using at the system prompt (:) no longer work.

To get the system prompt back, press (RETURN) a few times.

Caution

Do not enter the LOGON, LOGOFF, or SHUTDOWN commands at the "=" prompt until you know exactly what you are doing. These commands are extremely powerful and must be used only during a standard shutdown.

To move the console

You can move the console without physically moving your terminal. The console is a set of capabilities, including commands and two special prompts, that allow one terminal to communicate with and control the computer. To move the console, enter:

    CONSOLE *nn*

nn is the device number of the terminal you are moving the console to.

To allow users to access the console

Use the ALLOW command to distribute specific operator commands to system users. The ALLOW command specifies which users may execute operator commands and which commands the users may execute.

For example, to give the user USER.TECH the ability to execute the REPLY and ABORTIO commands, enter the following at the system console:

    ALLOW USER.TECH;COMMANDS=REPLY,ABORTIO

You may distribute console capabilities only to users who are currently logged on to the system, unless the @.@ option of the ALLOW command is used. In this case, all users are affected, whether or not they are logged on. Additional capabilities granted to a user are valid only for the duration of their current session. Once the user logs off, any special capabilities previously assigned are no longer applicable.

Communicating with the Users

To help you manage the computer, you can use three methods to send messages to the people using it:

■ Create the `WELCOME` message, which users see when they start a computer session.

■ Use the `TELL` command to create `TELL` messages, which are useful when the message is important, but not urgent. `TELL` messages get through to most, but perhaps not all, users.

■ Use the `WARN` command to send warnings only when the message is urgent, since warnings can disrupt some kinds of work on the terminal. All users see warning messages.

With the `TELL` and `WARN` commands, you can select which groups of people receive your message. You can send a message to everyone, to one person, or to a group of people, such as everyone using the `PAYROLL` account. You cannot select your audience for a `WELCOME` message.

To create a new WELCOME message

When people start a computer session, they typically receive two kinds of information:

■ A message from the computer system acknowledging the `HELLO` logon. This includes the date, the time, and the version number of the computer's operating system.

■ A `WELCOME` message from you, the system operator.

The `WELCOME` message is a convenient way to transmit information of general interest. For example, you can tell everyone when you plan to perform a *system backup,* a procedure for duplicating all of the important information contained in your computer. You can include your phone number in the message so that, in case of trouble, users can call you.

To create a new `WELCOME` message, enter:

    WELCOME

Wait for the "**#**" to appear on the screen, then begin creating your message. Enter your message on multiple lines as needed. For example:

```
Welcome to the HP 3000.  The system

will be shut down Mondays through Thursdays

at 8 PM to do a partial backup, and at

5 PM on Fridays for a full backup.

Please log off before those times.
```

To end the message, press [Return] at the "**#**" prompt. The system prompt returns to the screen. To check the message, use the `SHOWME` command. For example:

```
SHOWME
```

In addition to the description of your session, you should see the `WELCOME` message you just created.

To correct a mistake in the WELCOME message

If you make a mistake in the message while typing, do the following:

1. Press [Return].
2. When another "**#**" prompt appears, press [Return] again.
3. Enter `WELCOME`.
4. When the "**#**" prompt appears, retype your message.
5. To exit, press [Return] at the "**#**" prompt.

To erase the existing WELCOME message

To erase the existing `WELCOME` message, enter:

```
WELCOME
```

When the "**#**" prompt appears, press [Return]

To create and use a WELCOME message file

You can also use the text editor, EDIT/3000, to create the `WELCOME` message. In this case, enter the text into a file, save it, and then enter the name of the message file with the `WELCOME` command.

The following section allows you to practice creating a `WELCOME` message file, called "WELCMSG." Before you begin, find out if you already have a file named `WELCMSG`. Enter:

```
LISTFILE WELCMSG  [Return]
```

If the computer lists a file named `WELCMSG` and you want a different message, then pick another file name. Substitute it for `WELCMSG` in the following examples. Otherwise, enter the commands exactly as shown below.

1. Enter EDITOR and press (Return) to start the editor.

2. At the EDIT/3000 ("/") prompt, enter ADD and press (Return) to begin *add mode*.

   The first line number and a blinking cursor appear on your screen.

3. Enter the following lines of text, pressing (Return) at the end of each one. (Each time you press (Return), a new line and line number appear.)

   ```
   Welcome to the HP 3000.  The system
   will be shut down Mondays through Thursdays
   at 8 PM to do a partial backup, and at
   5 PM on Fridays for a full backup.
   Please log off before those times.
   ```

4. Enter // and press (Return) to end add mode.

5. Enter // and press (Return) a second time to indicate that you have completed your message.

6. At the "/" prompt, enter the KEEP command followed by the name of the welcome message file. In the example below, the file name is WELCMSG:

   ```
   KEEP WELCMSG (Return)
   ```

7. Enter the EXIT command and press (Return) to end EDIT/3000.

8. To have MPE/iX use the new welcome message, enter the WELCOME command and your file name. For example:

   ```
   WELCOME WELCMSG (Return)
   ```

9. To check the new WELCOME message, enter:

   ```
   SHOWME (Return)
   ```

Managing Session Activity

A session is a two-way dialog between you and the computer. The computer interprets and follows the commands that you enter at the keyboard, if it can. If it cannot, it uses an error message to tell you that something is wrong. Computer sessions are unique because you attempt to get the computer to perform a specific task.

To start a computer session

To start a computer session, enter your logon command at the MPE XL prompt:

    HELLO OPERATOR.SYS

The computer responds by displaying the version number of the operating system, the day, date, and time, and a welcome message, if one exists. When the system prompt (:) appears, the session has begun. For example:

```
USER: #S22,OPERATOR.SYS,PUB        (NOT IN BREAK)
RELEASE: X.21.13    MPE XL HP31900 A.43.11    USER VERSION: X.21.13
CURRENT: TUE, JAN 26, 1990, 10:31 AM
LOGON:   TUE, JAN 26, 1990, 10:30 AM
CPU SECONDS: 0            CONNECT MINUTES: 1
$STDIN LDEV: 106            $STDLIST LDEV: 106
:
```

To determine the session limit

To determine the maximum number of sessions (session limit) allowed on the system, enter:

    LIMIT

You will see both the job and session limit for your computer.

To set the session limits

You can set the session limit to any number up to the maximum limit configured for your computer. Most of the time, you either leave it alone or change it to zero. This prevents all but a few special users from starting new sessions on the computer, regardless of how many are currently using it.

You can only issue the LIMIT command from the console unless it is allowed to a user.

To lower the session limit to 0, enter:

    LIMIT ,0

Be sure to enter the comma before the 0. Otherwise, you change the job limit, not the session limit.

To check the new session limit, enter:

    LIMIT

No one already using the computer is affected by the low session limit. But anyone who tries to log on (except users assigned OP or SM capability) will see the message CAN'T INITIATE NEW SESSIONS NOW.

To reset the session limit

To reset the session limit to its normal value, enter:

    LIMIT,*nn*

Replace *nn* with your original session limit.

To bypass the session limit

If you have OP or SM capability, you can start a new session on the computer even when the session limit is set to 0. To do so, you add `;HIPRI` to the end of your computer identity to tell the computer to bypass whatever restrictions are in effect. This is known as a *high priority logon*.

Enter:

    HELLO OPERATOR.SYS;HIPRI

Aborting a Session

From the console, you can stop, or abort, someone's session. Aborting a session is an emergency measure. Usually, it is only one in a series of steps taken to handle a specific situation. For example, aborting a session is the last resort when you are troubleshooting a "hung" or unresponsive terminal. And it is possible that you may need to abort someone's session to shut down the computer, though this is less likely since an orderly shutdown automatically aborts all jobs and sessions.

To display the user name

You need at least a user name and an account name or session number to abort someone's session. If a user asks you to fix a terminal, the user must give you a user name and account name.

To find the user and account name, enter:

    SHOWJOB JOB=@S
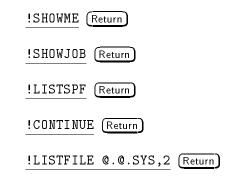
You'll see something like the following information on your console:

```
JOBNUM   STATE IPRI JIN   JLIST   INTRODUCED   JOB NAME

#S25     EXEC        20   20      MON  1:26P   OPERATOR.SYS
#S24     EXEC        22   22      SUN 12:27P   BOB.CAROLL
#S23     EXEC        24   24      SUN  9:06A   JULIE.JONES
#S64     EXEC        23   23      SUN  2:30P   MGR.PAYROLL
```

To abort a session

To abort a session, use the session number that you found with the SHOWJOB command. For example, to abort MGR.PAYROLL (who's session number is #S64), enter:

```
ABORTJOB #S64
```

You should get a logoff message like the one below, although it may take a few seconds.

```
14:45/#S64/32/LOGOFF ON LDEV #23
```

14:45 is the time when you entered ABORTJOB, #S64 is the payroll manager's session, and 23 is the hung terminal.

On the payroll manager's terminal, the computer prints the message "SESSION ABORTED BY SYSTEM MANAGEMENT" and some other information.

To summarize the procedure, complete the five steps listed below to abort a session on your computer when the need arises:

1. Enter SHOWJOB JOB=@S to find the session number.

2. Using that number, enter ABORTJOB #S*nnn*.

3. Look for a logoff message on the console.

4. Enter SHOWJOB #S*nnn* to make sure that there are "NO SUCH JOBS."

5. Complete steps 2 through 4 again if the job was not aborted on the first attempt.

To stop all sessions in an emergency

Hopefully, you will never be forced to stop all sessions or shut down the computer system without warning your users. In case it is necessary, you use two commands to do so:

- Issue the LOGOFF command logs off all executing jobs and sessions and prevent any further logons. This command also stops the console session.

- Issue the SHUTDOWN command to do an implicit =LOGOFF as well as perform an orderly shutdown of the rest of the system.

Caution

Do not issue these commands now. Read for your information only.

To immediately stop all jobs and sessions in an emergency:

1. At the console, hold down (CTRL) and press (A).

2. When the "=" prompt appears, enter:

    LOGOFF

Or enter:

    SHUTDOWN

Since your session on the console is also stopped, you'll see the message SESSION ABORTED BY SYSTEM MANAGEMENT on the console screen. (You receive a logoff message about your session because, regardless of whether or not you are using the console, it is still the computer's message center.)

Note

Entering the SHUTDOWN command is the last in a series of steps performed to shut down the computer system. Refer to chapter 10, "Shutting Down the System" for information on system shutdown.

Managing Job Activity

A job is a sequence of instructions given to the computer to process. It involves two separate steps: creating the job (which involves entering instructions in a job file and saving it) and telling the computer to process the job.

To create a job file

Use EDIT/3000 to enter computer instructions into a job file. To create a job file, do the following:

1. At the system prompt, enter EDITOR.

   EDIT/3000 identifies itself, displays the day, date, and time, and then displays the EDIT/3000 prompt, "/".

2. At the "/" prompt, enter:

    ADD

   EDIT/3000 responds by displaying line number 1 and the blinking cursor:

3. Enter !JOB followed by an optional job name and your user name (which is required) to identify the job. For example, enter:

    !JOB MYJOB,OPERATOR.SYS

   If necessary, enter the passwords associated with your user name and account. For example:

    !JOB *jobname*,OPERATOR/*userpass*.SYS/*accountpass*

   When you press (Return) at the end of the first line, another line number appears.

4. Begin each new line of the job file with an exclamation point (`!`). Otherwise, the computer will not know how to interpret your instructions. For example, enter:

   `!SHOWME` [Return]

   `!SHOWJOB` [Return]

   `!LISTSPF` [Return]

   `!CONTINUE` [Return]

   `!LISTFILE @.@.SYS,2` [Return]

   `!EOJ` [Return]

5. To end the job file, enter this on the line following the `!EOJ`:

   `//`

   The editor's prompt reappears on the screen.

6. Enter `LIST ALL` and check what you have entered at the console. If necessary, use the `MODIFY` command to correct any typing mistakes.

7. Keep the job as a permanent file, unnumbered, by entering:

   `KEEP MYJOB,UNN`

8. Wait a moment for EDIT/3000's prompt to return to the screen. If instead you see the message `MYJOB ALREADY EXISTS`, keep the file with a new name.

9. Enter the `EXIT` command to quit EDIT/3000.

To review your job file

If you followed the preceding steps, you have created a job file. Let's review each part.

The first line is required. It identifies the job to the computer in the same way that you use the `HELLO` command to begin a computer session. (If you are required to use passwords, they must appear in the first line too.)

`!JOB` *jobname*`,OPERATOR/`*userpass*`.SYS/`*accountpass*

If you rename the job file, you may want to change the job name to match to more easily remember the job.

The commands in the job file are the instructions that the computer executes when it processes the job. Some of these should be familiar to you:

Line	Command	Purpose
1	`!JOB MYJOB,OPERATOR.SYS`	Begin the job.
2	`!SHOWME`	"Tell me who I am."
3	`!SHOWJOB`	"Tell me who is using the computer."
4	`!LISTSPF O@`	"Tell me who is printing reports."
5	`!CONTINUE`	"If the next command causes an error, ignore it and go to the next one."
6	`!LISTFILE @.@.SYS,2`	"List all the files in my account."
7	`!EOJ`	"That is the end of this job."

The commands in lines 2 through 6 have something in common. Each one, except `CONTINUE`, reports information to you. If you entered these commands at the console, the information would appear on the console. Since these commands are grouped together into a job file, the information is collected in a report. When the job is finalized, you can pick up the report from your printer.

You end a session by entering `BYE`. Similarly, you always end a job by entering `EOJ` (end of job) on the last line of the job file. It tells the computer not to expect any more instructions or information from this job file.

To start a job   Use the STREAM command to start a job. Streaming a job introduces it to the computer and, in most cases, immediately begins the job. If there are restrictions on job processing, like a low job limit or a high jobfence, the computer keeps track of the job until it can begin.

To start a job, enter:

>   STREAM *jobfilename*

For example, to start the job named MYJOB, enter:

>   STREAM MYJOB

The first thing you see is the number the computer assigned to your job. Then a message appears on the console and, if there are no restrictions on job processing, it will resemble this:

```
#Jnnn
:
15:49/#Jnnn/29/LOGON FOR: "MYJOB,OPERATOR.SYS" ON LDEV #10
```

#J*nnn* is the number assigned by the computer.

To schedule a job   You can schedule your job to begin at a specific time or in a specific number of minutes, hours, or days.

To schedule a job at a specific hour

To schedule a job to begin at 8:00 p.m., enter:

>   STREAM MYJOB;AT=20:00

You must use a 24-hour clock to tell the computer a specific time at which to begin a job. For the hours between 1:00 p.m. and midnight use 13:00 to 24:00 hours. For example, 3:35 in the morning is expressed "3:35." The same time in the afternoon is expressed "15:35".

To verify that the job is scheduled to begin at the correct time, enter:

```
SHOWJOB SCHED
```

The computer describes your job and others that are scheduled. The date defaults to the current date; only the time indicated in the `SCHEDULED-INTRO` column is relevant.

```
CURRENT:   1/30/94 9:35

JOBNUM STATE IPRI JIN  JLIST  SCHEDULED-INTRO  JOB NAME

#J13   SCHED   8  10S  LP     1/30/94  20:00   MYJOB,OPERATOR.SYS
```

To schedule a job to start in a few hours

Instead of telling the computer to begin the job at a specific time, you can tell it to start the job in a few hours. For example, if it is 9:30 in the morning and you want to begin the job at 8:00 that night, tell the computer to begin the job in ten and a half hours. To do so, enter:

```
STREAM MYJOB;IN=,10,30
```

Use commas as placeholders. The preceding command starts the job 0 days from now, so the first comma appears in place of 0. You could have expressed ten and a half hours from now as "0,10,30", or "0 days, 10 hours, and 30 minutes" from now. To schedule the job for just 30 minutes from now, you could enter the time as ",,30" or "0,0,30".

If you mistype the entry, the computer displays an error message. Reenter the command with the proper specifications. If you have scheduled the job correctly, the computer assigns it a job number.

To check on your job, enter:

```
SHOWJOB SCHED
```

To schedule a job to begin on a specific day

To tell the computer to begin the job in one day, 10 hours, and 30 minutes, enter:

```
STREAM MYJOB;1,10,30
```

Lowering and Resetting Job Limits

You can set a limit on the number of jobs the computer processes at the same time. Most of the time, you will lower the limit to 0 or leave it alone. Lowering the limit does not affect jobs that the computer is processing already. It affects only those that are streamed after you lower the limit.

To determine the jobfence

The jobfence is a barrier that keeps some jobs from being processed. It may be a value between 0 and 14. To be eligible for computer processing, a job's input priority must exceed the jobfence. A jobfence of 14 prevents all jobs from processing.

To determine the jobfence, enter:

SHOWJOB STATUS

If there are no jobs, you'll see the message NO SUCH JOBS. Otherwise, the system issues a description for each one, something like the following display:

```
JOBNUM   STATE IPRI JIN  JLIST      INTRODUCED   JOB NAME

#Jnnn      WAIT  D  8 10S  LP         MON  3:29P  MYJOB,OPERATOR.SYS

JOBFENCE= 14; JLIMIT= 10; SLIMIT= 60
```

In this example, the jobfence is set to its maximum value, 14, which prevents all jobs from executing. The job listed (MYJOB,OPERATOR.SYS) has an input priority of 8, which means that it will continue to wait until the jobfence is lowered to 7 or less.

To determine the job limit

To determine the job limit, enter:

LIMIT

Or, you can determine the job limit by typing SHOWJOB (to see a list of all jobs and sessions) or SHOWJOB JOB=@J (to see a list of jobs only).

If you enter SHOWJOB JOB=@J, the system displays information that resembles the following:

```
JOBNUM   STATE IPRI JIN   JLIST    INTRODUCED   JOB NAME


#J10     EXEC       10S   LP       MON  3:29P   MAILMAN.HPOFFICE
#J46     WAIT  D 1  10S   LP       MON  4:18P   JOB1,USER.ACCOUNT
#J55     SUSP       10S   LP       MON  9:08A   ARJOB,MGR.ACTRECV


3 JOBS:
  0 INTRO
  1 WAIT; INCL 1 DEFERRED
  1 EXEC; INCL 0 SESSIONS
  1 SUSP
JOBFENCE= 7; JLIMIT= 10; SLIMIT= 60
```

The numbers under JOBNUM are the job numbers, and STATE describes what is happening to the job.

JLIMIT=10 is your job limit. The computer lists jobs that currently are processing as EXEC, or executing. Suspended jobs (jobs that the computer was processing, but that have temporarily been halted) are listed as SUSP. Jobs that the computer has not yet processed are listed as WAIT, or waiting.

Jobs scheduled to begin later are listed directly below the others in a separate section:

```
CURRENT:  1/30/94 15:30


JOBNUM   STATE IPRI JIN   JLIST    SCHEDULED-INTRO   JOB NAME


#J13     SCHED   8  10S   LP       1/30/90  20:00    MYJOB,OPERATOR.SYS
```

To lower your job limit

To lower the job limit, enter:

```
LIMIT 0
```

You use the same command to limit both jobs and sessions. The first number always specifies the job limit, and the second number, the session limit. If you want to change the session limit only, you must insert a comma before the number as a placeholder.

So, for example, to lower both the job and session limit, enter:

```
LIMIT 0,0
```

Or, to lower just the session limit, enter:

```
LIMIT ,0
```

To check the new limit, enter:

```
SHOWJOB STATUS
```

To reset the job limit

To reset the job limit, enter:

```
LIMIT n
```

Replace n with the job limit number.

To change a job's priority

Use the ALTJOB command to raise or lower a job's priority. Raising the priority tells the computer that the job is urgent and should be processed ahead of the others. Lowering the priority puts the job on hold until you change its priority or until you change the jobfence.

To change a job's priority to 0, enter the ALTJOB command and the job's number (in place of nnn) as shown in this example:

```
ALTJOB #Jnnn;INPRI=0
```

To check on the job, enter:

```
SHOWJOB #Jnnn
```

It will be listed as "D 0", or "deferred, with a priority of 0."

You can make the job eligible for processing again by raising its priority above the jobfence or by lowering the jobfence.

To raise the job's priority

To raise a job's priority to 14, enter the ALTJOB command and the job's number (in place of nnn) as shown in this example:

```
ALTJOB #Jnnn;INPRI=14
```

The value 14 is the highest priority you can give a job.

To suspend a job

You can temporarily stop any job that is listed as "EXEC" (executing). The computer still keeps track of it, listing it as "SUSP" (suspended) until you restart or abort the job. To suspend a job, enter:

SPOOLER DEV=nn;SUSPEND

To suspend a processing job

To suspend a job that your computer is processing, enter the BREAKJOB command and the job's number (in place of nnn) as shown in this example:

BREAKJOB #Jnnn

To list suspended jobs

To list any suspended jobs, enter:

SHOWJOB SUSP

If there are no suspended jobs, the computer sends you a NO SUCH JOB(S) message. If any jobs are suspended, the computer lists them in this form:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J11    SUSP        10S  SERIALP  MON 3:29P   JOB2.HPOFFICE

JOBFENCE= 7; JLIMIT= 10; SLIMIT= 60
```

To restart a suspended job

To restart a suspended job, enter the RESUMEJOB command and the job's number (in place of nnn) as shown in this example:

RESUMEJOB #Jnnn

To abort a job

You can stop or abort any job. Aborting a job is similar to forcing someone to log off the computer; you even use the same command. Aborting a job does not destroy the job file, though. It just removes the job from the computer's list of things to do.

To abort a job, first identify the job number by entering:

        SHOWJOB JOB=@J

You must abort jobs one at a time. To do so, enter the `ABORTJOB` command and the number of the job you want to abort (in place of *nnn*) as shown in this example:

        ABORTJOB #J*nnn*

Repeat the `ABORTJOB` command for each job that you want to abort. To verify that a job was successfully aborted, enter the `SHOWJOB` command and the job number (in place of *nnn*) as in the following example:

        SHOWJOB #J*nnn*

When the computer sends you a "`NO SUCH JOB(S)`" message, then you have succeeded.

Removing and Returning System Devices

From time to time, it may be necessary to remove peripheral devices from, and return devices to, the system. Use the `DOWN` and `UP` commands, respectively, to do so.

To remove a device from system use

To remove a device from the system, type the `DOWN` command followed by the LDEV number of the device. For example, to *down* LDEV 23, enter:

        DOWN 23

Caution

When a device is powered down, subsequent access to that device can result in indefinite waiting, erroneous transfers, or other incorrect operations. Often these failures occur with no indication to the system operator or to the user. For these reasons, use the `DOWN` command before a device is powered down for removal. This commands does not apply to the console or to disk drives.

To return a device for system use

To return a particular device to its normal function on the system, use the `UP` command. For example, to bring LDEV 23 back up, enter:

        UP 23

Managing Directories

The structure of the HP 3000 file system traditionally allowed for a three-level hierarchy made up of accounts, groups, and files. With Release 4.5 of MPE/iX, the file system is now tree-strucured, or hierarchical. It uses directories, which are a special kind of file that points to other files and directories, to organize files in a logical manner.

The hierarchical directory structure has a common root, called the **root directory** and denoted by a slash (/). The root is the foundation of the HP 3000 directory structure since it contains all files and directories on the system. You can now put files under accounts in addition to being able to put them under groups, directories, and root.

To use pathnames

A **pathname** describes the route (or path) to a file. It is composed of the file name prefixed by any directory names. A slash (/) separates each part of a pathname. The maximum pathname length is 1023 characters, but other system limits can restrict pathname length. For example, the command interpreter limits the number of characters you can type in a command to 511 characters.

When the pathname begins at the root directory, it is called an *absolute pathname.* An absolute pathname is similar to a fully qualified MPE file name in that the names of all the components are listed. For example, the fully qualified MPE file name `TDP.PUB.SYS` translates to the absolute pathname `/SYS/PUB/TDP`.

Note

File names using HFS syntax can use upper- and lower-case letters, and they are case sensitive. (For example, the file `My_file` is not the same as the file `my_file`.) You must specify all traditional (classic) MPE names in uppercase.

Other pathnames are relative to a process's current working directory, which is the directory where you are working. If you specify the name `./finance/expenses`, MPE looks for a subdirectory called `finance` in your current working directory, then for a file called `expenses` in that directory.

Access to directories

Access to directories is controlled by Access Control Definitions, or ACDs. They include:

CD - Create directory entries
DD - Delete directory entries
RD - Read directory entries
TD - Traverse directory entries
RACD - Read ACD
NONE - No access

By default, directories allow Read ACD privilege to all users on the system (RACD:@.@). You assign or change directory ACDs using the `ALTSEC` command. To display directory ACDs, use the `LISTFILE` command. Refer to Chapter 9 for more information about ACDs and to the *MPE/iX Commands Reference Manual, Vol. I* (32650-90003) for detailed syntax and descriptions of `ALTSEC` and `LISTFILE`.

The root directory, accounts, and groups cannot be assigned ACDs. However, all users are granted access equivalent to read directory entries (RD) access and traverse directory entries (TD) access to root, all accounts, and all MPE groups.

You can create directories in any directory, group, or account to which you have CD access. You must have the following privileges to create directories:

- Create directory entries (CD) access for the parent directory (or the equivalent, if the parent is a group)

- Save files (SF) capability

- Traverse directory entries (TD) access to the parent directory

To name directories

Directory names follow the same rules as file names. Directory names can include the special characters - (hyphen), _ (underscore), and . (dot); they can be uppercase, lowercase, or a combination of the two. The maximum name length for a directory created in the root directory, an MPE group, or an MPE account is 16 characters. Subdirectories of hierarchical directories can have names that are up to 255 characters long. They cannot begin with a hyphen.

The file names dot (.) and dot-dot (..) have special meaning. The special file name dot at the beginning of a relative pathname refers to the current working directory. The name dot-dot refers to the directory that is the next level up, also called the *parent directory*.

To work with directories   The table below lists the commands that are useful for managing directories on the HP 3000 and briefly defines each one. For more complete information and examples, refer to the *MPE/iX Commands Reference Manual Volumes 1 and 2* (32650 -90003 and 32650-90364).

Table 5-1. Working with Directories

Command	What it Does
NEWDIR	Create a new directory. To create a new directory in the current working directory, enter NEWDIR and the directory name. To create a new directory in another group, enter NEWDIR followed by the full pathname of the group.
LISTDIR	A system-provided UDC that lists all directories and files in your current working directory. As the default, it does not list subdirectories that exist below any of the directories. To use LISTDIR to see any directories on the system, enter LISTDIR dir@.
PURGEDIR	Deletes a hierarchical directory. You cannot use PURGEDIR to delete an account, an MPE group, the root directory, or to directly delete a file. (PURGEDIR will delete files in a directory when you specify the TREE option.)
CHDIR	Moves from one directory to another. To return to your logon group (your initial working directory), enter CHDIR with no arguments. To move to the next level up, enter CHDIR followed by two dots (..). To move to another directory relative to the current directory, enter CHDIR ./ followed by the directory name, for example, CHDIR ./accounting.
SHOWVAR HPCWD	Displays the current working directory. HPCWD is a CI variable that you can also include in the prompt.
DISKUSE	Displays the amount of disk space used by a directory. To see the amount of disk space used by the directory you specified and all of the files and directories below it, add a trailing slash (/) to the command line or use the TREE parameter. For example, DISKUSE /finance/ or DISKUSE /finance ;tree.
FINDDIR	A system-provided UDC that search for a directory name (or pattern) starting at root.

Getting Online Help with Commands

The online help facility provides command information, syntax, explanations of command parameters, and examples of command use for MPE/iX commands. Any user can use it.

To get information about MPE/iX commands

To get information about the system, use the Help Facility. To begin the Help Facility, use the `HELP` command.

1. Enter `HELP` at the system prompt, and press (Return).

   `:HELP` (Return)

   The following Help Facility menu, HELPMENU, appears on your screen:

```
                    This is the MPE/iX Help Facility
        ----------------------------------------------------
   *      Enter SUMMARY, CLASS, a commandname, or HELPSTUDY      *
        ----------------------------------------------------
   SUMMARY....              A summary MPE/iX commands & HELP


   CLASS......              Classes of Commands
                            SESSIONS, JOBS, FILES, SUBSYSTEMS, ETC.


   <command name>          COMMAND entries, by name
   <command name><keyword> COMMAND entry with keyword
                           PARMS, OPERATION, EXAMPLE


   HELPSTUDY               A beginner's introduction to Help


   EXIT                    To leave the Help Facility

              You can use UPPERCASE or lowercase.

   >>>>>>>>>>  The name of this screen is HELPMENU  <<<<<<<<<<
   >
```

2. At the Help Facility prompt (>), type in an option from the HELPMENU, namely SUMMARY, CLASS, a command name, a command name and parameter, HELPSTUDY, or EXIT.

3. To leave the Help Facility, type either `E` or `EXIT`. This action will return you to the system prompt (:).

   `>EXIT` (Return)
   `:_`

To list commands by classification within the Help Facility

The Help Facility provides lists of MPE/iX commands classified by the type of tasks performed by the commands.

1. If you are not in the Help Facility (identified by the ">" prompt), enter HELP (Return) at the system prompt.

2. Enter CLASS to display command classifications.

3. Press (Return) to scroll through the display.

4. Press (E) (Return) to exit the Help Facility.

To display command information within the Help Facility

To get information about a specific command, type HELP at the system prompt. Keywords allow you to limit the amount of information and display only the details that are of interest to you.

1. If you are not in the Help Facility (identified by the ">" prompt), enter HELP (Return) at the system prompt.

2. Enter the command name and an optional keyword at the Help Facility prompt (>).

   Select the keyword from this list:

   a. PARMS lists all parameters for the command and describes each one.

   b. OPERATION provides an explanation of how the command works and when to use it.

   c. EXAMPLE offers examples of the command and its parameters.

   For example, to see how the command SHOWME works, type the following:

   >SHOWME OPERATION (Return)

3. Press (Return) to scroll through the display.

4. Press (E) (Return) to exit the Help Facility.

To display Help outside the Help Facility

If you know what type of information that you are looking for, you can access it directly from the system prompt by specifying the details in your Help request.

1. From the system prompt, enter `HELP` followed by the command name, followed by an optional keyword (`PARMS`, `OPERATION`, or `EXAMPLE`).

2. Press (Return).

The following uses the `SHOWTIME` command as an example:

```
:HELP SHOWTIME EXAMPLE (Return)
EXAMPLE


     To display the time and date, enter


     SHOWTIME
     WED, JUL 24, 1991, 8:47AM

KEYWORDS: PARM,OPERATION,EXAMPLE
:
```

You are returned to the system prompt after this display. Requesting help directly at the system prompt provides quicker help access if you know the command name that you want help on.

To display Help from within another program

You do not need to leave a program to get help. Most of HP's programs allow Help requests from within the program.

1. Precede the `HELP` command with a colon (:).

2. Enter the `HELP` command followed by the command name and optional keyword.

3. Press (Return) or (Enter).

4. Continue work within the program at the program prompt.

In the following example, the user requests a display of the `SHOWJOB` command parameters from within the EDIT/3000 program. The "/" prompt is unique to the EDIT/3000 program. Without including the colon (:) before the `HELP` command here, the program would expect one of its subcommands.

Example:

```
/:HELP SHOWJOB PARMS (Return)
```

Getting Online Help with Error Messages

There is an easy way to get information on what caused an error or warning message to occur and what action you need to take to correct the problem. Simply type the HELP command followed by one of three prefixes, and the error message number.

- Type CIERR and the number for Command Interpreter errors.

- Type SR and the number for Store or Restore errors

- Type CIWARN and the number for Command Interpreter warning messages

Exclamation points (!) may appear in some error or warning messages while you are using online help. They act as a system input placeholders and can be ignored.

To get help with Command Interpreter errors

To find out more information about errors related to how commands are entered, type HELP followed by CIERR*nn*, where *nn* is the error number.

In the following example, an error message is displayed on the screen.

```
:showjov
       ^
UNKNOWN COMMAND NAME.  (CIERR 975)
```

To get information about the error, type HELP CIERR975 at the prompt. (Make sure that you remove all spaces when typing in the error message number.) In this example, the information you see is this:

```
:HELP CIERR975  (Return)

MESSAGE  UNKNOWN COMMAND NAME.  (CIERR 975)

CAUSE    A command was entered is not a valid MPE/iX command.

ACTION   Check the MPE/iX Commands Reference for a list of valid MPE/iX
         Commands.

:_
```

To get help with Store/Restore errors

To display information on STORE or RESTORE error messages, type HELP followed by SR*nn*, where *nn* is the error message number.

In the following example, a Store/Restore message is displayed on the screen:

```
STORE/RESTORE ENCOUNTERED UNKNOWN MEDIA ON LDEV3 (S/R 11)
```

To get more information, type HELP SR11 at the prompt. (Make sure you remove the **/** symbol and do not include any spaces when typing the error message number.)

```
:HELP SR11  [Return]

MESSAGE STORE/RESTORE ENCOUNTERED UNKNOWN MEDIA ON LDEV! (S/R 11)

CAUSE   Media type is incompatible with store subsystem.

ACTION  Mount compatible media type or update store.
```

To get help with Command Interpreter warning messages

To display information on command interpreter warning messages (CIWARN), type HELP followed by CIWARN*nn*, where *nn* is the warning message number.

In the following example, a command interpreter warning message is displayed on the screen:

```
SPECIFICATION OF NOCCTL OVERRIDES PREVIOUS CCTL.  (CIWARN 222)
```

To get more information, type:

HELP CIWARN222

Remember, don't type any spaces between the label (CIWARN) and the warning message number. You'll see information similar to the following:

```
:HELP CIWARN222 [Return]
MESSAGE SPECIFICATION OF NOCCTL OVERRIDES PREVIOUS CCTL.
        (CIWARN 222)

CAUSE   You have specified NOCCTL and the system is warning you that
        your specification of CCTL earlier in the command line is
        being overridden.

ACTION  No action is required, unless you actually want to specify
        CCTL rather than NOCCT, in which case you must reenter the
        command, omitting the NOCCTL specification.
```

6

Copying Files to Tape

The most important part of your computer system is the files that you and other users create. Under normal circumstances, the original files remain safely stored on your computer's disk. Because they represent months of work, you should also keep a full set of duplicates.

In this chapter, you learn how to perform the following tasks:

- Storing MPE and HFS files
- Listing the files stored
- Checking file listings for errors
- Using a long or short file display
- Displaying file dates
- Displaying file security information
- Removing unused files from the system
- Copying tapes to another system

An Overview of the Store Process

Typically, when someone needs to store files, the following things happen:

1. The user assigns a name to the backup device (using the `FILE` command) and issues a `STORE` command to store some or all of his or her own files.

2. The `STORE` command automatically sends a tape request to the console.

3. If the tape drive is available, you load and prepare a tape for file copying. Then, to let the user (and the STORE program) know that the copying can begin, you answer the tape request.

4. When all the files have been copied, you remove the tape and give it to the user.

There may be times, however, when you are both the user and the system operator. In this case, you issue the `FILE` and `STORE` commands to store a set of your own files or a set of system files and you also handle the media and monitor the console for `STORE` messages. This chapter describes the store process with this in mind.

The next section explains how and when to issue a `FILE` command to name a backup device. Following that is a brief explanation of the hierarchical file system (HFS) that was introduced with Release 4.5 of MPE/iX, along with the general rules for specifying file sets using MPE syntax and HFS syntax. The remainder of the chapter describes the how to use the `STORE` command and all of its options.

To assign a name to the backup device

Use the `FILE` command to assign a file name to a backup device according to its logical device number (LDEV), or its device class. Using the backup device's logical device number is a more exact way to assign a file name to a particular device. There is only one device with LDEV number 8 in your system. However, several devices may be assigned the device class `TAPE`.

For example, to assign the file name `T` to LDEV 8, enter:

```
FILE T;DEV=8
```

Or, for example, to assign the file name `BACKUP` to all devices with the device class name `TAPE`, enter:

```
FILE BACKUP;DEV=TAPE
```

When you are choosing how to reference a backup device in the `FILE` command, keep in mind that you must reply to device requests at the console under two circumstances:

- When you use a device class that has been assigned to more than one device in the `FILE` command to name backup devices

- If Auto Reply is not enabled on the designated device

To set up an auto reply device

Some backup devices have an Auto Reply feature. To set up such a device so that it automatically replies to a request, enable Auto Reply on the device and assign it a unique name with the `FILE` command. The simplest way to assign it a unique name is to reference the device by its LDEV number. You may, however, reference it by device class name so long as the device class name is associated with one, and only one, device.

To choose the files you want stored

You use the *filesetlist* parameter of the `STORE` command to specify exactly which files you want stored: one file, several files, or all the files on the system. In addition to naming many kinds of file sets, you can name file subsets to be excluded from the STORE process.

With Release 4.5 of MPE/iX, the file system is no longer limited to three levels (account, group, and user) but instead is *hierarchical*, or tree structured. To facilitate this new organization, MPE/iX uses a new type of file, called a **directory**, which contain lists of files and pointers to those files. Users can now keep MPE files in directories as well as in groups, and a single directory (or a group) can have multiple levels of subdirectories within it. Moreover, all files in the system are stored in a root directory, represented by the slash character (**/**).

The introduction of the hierarchical file system (HFS) has resulted in changes to the process of storing files which you, as the system operator, need to understand. The next few sections outline the changes you can anticipate. Throughout this chapter, you will see examples of the `STORE` command that include MPE syntax and HFS syntax. For the complete syntax of the `STORE` command and the text of the error messages, refer to the *MPE/iX Commands Reference Manual, Vol. II* (32650-90374).

Note

For a thorough explanation of HFS, read *New Features of MPE/iX: Using the Hierarchical File System* (32650-90351).

To name file sets in MPE and HFS syntax

Valid file names that use MPE syntax are also valid in HFS syntax; however, the converse is not necessarily true. For example, the MPE file name `STORE.PUB.SYS` is equivalent to `/SYS/PUB/STORE` in the HFS syntax; but the file name `/tmp/store` is not a valid MPE file designation because HFS syntax is case sensitive whereas MPE syntax is not. As a result, the way you specify the file set to store or restore has changed.

Here are the rules for specifying MPE/iX file sets in the `STORE` command:

- To perform a full system backup, use `/` as the file set instead of `@.@.@`. (You can use `@.@.@`, but `/` is recommended.)

- If you are storing selected files on your system, separate multiple file sets with a ",".

- Specify exclusions from a file set by including a "-" symbol before the file set.

- Since "-" is a valid file name character, make sure that it is preceded by a blank so that it is recognized as a negative file set symbol in an HFS syntax file set.

To use wildcard characters and character sets

You can use wildcard characters in the file set specification. This allows you to store, for example:

- all files directly under a specified directory

- all files and directories at all levels below and including a specified directory

- the hierarchical directory structure (i.e., the entire file system)

You may use the following wildcard characters and character sets to refer to a set of files: @, #, ?, [xy], [x-z], [ax-z]. Table 6-1 shows the meanings of the wildcard characters and provides examples.

Table 6-1. Wildcard Characters and Character Sets

Character	Meaning	Example
@	Represents zero or more alphanumeric characters. By itself, it means "all members of the set".	n@ designates all items that begin with the character n.
#	Represents one numeric character.	n## designates all items beginning with the character n and followed by two numeric characters.
?	Represents one alphanumeric character.	?n designates all two-character items that end with n.
[xy] (any alphanumeric characters)	Specifies a list of characters.	[ad]@ stores all files beginning with a or d.
[x-z] (any range of alphabetic or numeric characters)	Specifies a range of characters.	[c-t]@ stores all files beginning with c through t.
[ax-z] (any list of alphanumeric characters and any range of alphabetic or numeric characters)	Specifies a list of characters combined with a range of characters.	@[1e-g] stores all files ending with 1 or e through g.

Note   Since the hyphen (-) is a valid character in HFS syntax names, you may use it inside a character set immediately following a left bracket ([) or preceding a right bracket (]). When specified between two characters, the hyphen implies a range of characters.

Every path component specified in the file set expands to include all
directories, accounts, or groups at the level that match the wildcard.
So, for example, to store all files and directories at the third level
below the root directory, the file set would be **/@/@/@**. If you include
a trailing slash (**/**) in the file set, then all of the directory matches at
the last component of the specified set are scanned recursively. For
example, to store all files and directories at the third level below the
root directory and any files and directories below that level, the file
set would be **/@/@/@/**.

You can use two options, **TREE** and **NOTREE**, to override the trailing
slash on the file set. The **TREE** option forces every file set to be
scanned recursively from the specified level, including any levels
beneath it; the **NOTREE** option forces every file set to be scanned at
the specified level.

The following table shows examples of valid MPE/iX file sets for
STORE and RESTORE.

Table 6-2. Example File Sets for STORE/RESTORE

File Set	Contents
?@.@.@	All files and directories directly under MPE groups whose names conform to MPE syntax
./file1	file1 in the current working directory
./@ or @	All files and directories directly below the current working directory
?@	All files and directories in the current working directory whose names conform to MPE syntax
./[aA]@	All files or directories in the current working directory whose names begin with "a" or "A"
./dir1/@	All files or directories located in the subdirectory dir1 in the current working directory
/SYS/PUB/@ or @.PUB.SYS	All files or directories in directory /SYS/PUB
/@/@/@	All files or directories three levels below the root directory
./dir1/a@, ./dir1/@a	From the current working directory, all files and directories in dir1 beginning or ending with "a"
./dir1/@ - ./dir1/a@	From the current working directory, all files and directories in dir1 except those beginning with "a"
/@/@/@ - /SYS/PUB/@	All files and directories exactly three levels beneath the root directory except the files and directories in /SYS/PUB
/ or @.@.@	All files and directories on the system (beginning with the root directory and moving down through the entire file system)
./dir1/	From the current working directory, all files and directories beneath and including dir1
./dir1/a@, ./dir2/	From the current working directory, all files and directories beginning with "a" directly beneath dir1; and all files and directories at all levels beneath and including dir2 of the current working directory
./d1/ - ./d1/dir2/@	All files and directories at all levels beneath and including d1, except for those files and directories that are in subdirectory dir2
./dir@/ - ./dir1/dir2/	From the current working directory, all files and directories beneath directories matching dir@ (such as dira, dirb, etc.), except the files and directories under subdirectory dir1/dir2 (or subdirectory dir2 of dir1 of the current working directory)
/ - @.@.@	All files and directories that are outside of MPE syntax

Anytime the file name part of a MPE syntax name is equal to @ the name will be folded to an equivalent POSIX name. This folding is only done for inclusion file sets, it is not done for exclusion (negative) file sets.

If you omit a list of files in the STORE command (except in conjunction with the DIRECTORY parameter), the default fileset is all files in your current logon group.

To use character sets in the file set

You can also use character sets to name groups of files. A character set is a series of characters to substitute for a single character. For example, to store all files beginning with the character a, b, c, d, e, or f in the current working directory, enter:

```
FILE T;DEV=TAPE
STORE [a-f]@;*T
```

Or, for example, to store all files ending with e, f, g, or 1 in the current working directory, enter:

```
FILE T;DEV=TAPE
STORE @[e-g1];*T
```

You may specify a maximum of 16 characters for each fully qualified file designator part; you may not nest brackets.

Storing Files

The next sections teach you how to store:

- a single file, a group of files, or all files on the system

- all files in a set that you specify, excluding files that you don't want to store

- a set of files that share the same file codes

- a set of files accessed after a certain date, or files that have not been accessed since a certain date

- a set of files on a particular volume set

In addition, you will learn how to respond to tape requests, monitor the progress of the STORE command and display information about the files you are storing.

To store a single file

1. Select a tape and place the tape drive online.
2. Mount the tape.
3. At the console, enter:

   <u>FILE T;DEV=TAPE</u>
   <u>STORE *filename.groupname.accountname*;*T</u>

   You may also omit the device parameter (as shown in the example below). In this case, MPE/iX creates a default file equation with your username.

   <u>STORE *filename.groupname.accountname*</u>

   For example, to store the file MYFILE in the group PERSONAL in the account SYS, enter:

   <u>STORE MYFILE.PERSONAL.SYS;*T</u>

   If you are storing a file using HFS syntax, enter:

   <u>STORE *path/filename*;*T</u>

   For example, to store my_file in the directory my_dir, enter:

   <u>STORE /my_dir/my_file;*T</u>

To monitor STORE command progress

After you enter a STORE command, STORE issues a message similar to the following on the console:

STORE/RESTORE VERSION A.21.01 (C) 1986 HEWLETT-PACKARD CO.
TUE, JAN 6, 1990, 2:57 PM

Monitor the console for additional messages. STORE sends you messages when you need to reply to a tape request, to add a write ring to a tape reel, or to mount a new tape on a backup device.

To respond to tape requests

When your backup devices are not configured to be automatically allocated, the system answers your STORE command with one or more tape requests. See chapter 1, "Managing Tapes and Tape Drives" for more information on tape requests.

If you have previously issued a FILE command that included the backup device's LDEV number, the tape request asks you to confirm that number. For example,

?14:57/#S25/43/IS "T" ON LDEV #8 (Y/N)?

**To request progress
messages**

Use the `PROGRESS` parameter in your `STORE` command to display
progress messages at regular intervals. To request progress messages
every 5 minutes, enter:

STORE *fileset*;PROGRESS=5

The system displays progress messages every 5 minutes.

STORE OPERATION IS 4% COMPLETE

You see similar messages at regular intervals, for example:

STORE OPERATION IS 7% COMPLETE
STORE OPERATION IS 11% COMPLETE
STORE OPERATION IS 14% COMPLETE

If you use the `PROGRESS` parameter alone, without specifying an
interval, STORE displays progress messages every minute.

**To mount additional
tapes**

When `STORE` has filled a tape but there is additional information to
store, it asks you to mount another tape. You see a mount request
and an `LDEV NOT READY` message like the ones below:

15:28/#S43/59/MOUNT REEL 2 FOR STORE ON LDEV 8
15:29/#S43/59 LDEV 8 NOT READY

To mount another tape:

1. Unload the first tape and stack it, label side down, on top of any
   tapes previously written on this drive during the current STORE
   operation. Remove the write ring.

2. Select the next tape from the prepared stack near the backup
   device. If there are no more tapes prepared, prepare a new tape,
   following the instructions in this chapter.

3. Mount the new tape.

4. Continue monitoring the backup process. Mount new tapes as the
   system requests them.

When you see the `END OF PROGRAM` message, the `STORE` process is
complete. To be absolutely sure that important files have been stored
correctly, it is a good idea to check the file listings and verify that
stored files were copied correctly.

To store several files

To store two or more files at the same time, list all the files but
separate their names with commas. For example:

FILE T;DEV=TAPE
STORE FILE1.PUB.RESEARCH,FILE2.PUB.ACCTING;*T

Or you can use HFS syntax to specify the files. For example:

FILE T;DEV=TAPE
STORE /RESEARCH/PUB/FILE1,ACCTING/PUB/FILE2;*T

To store all files in a single group or account, use a wildcard specification. For example, to store all files and directories in the current working directory, enter:

```
STORE ./@;*T
```

Or, for example, to store all files and directories in the current working directory and in directories below it that conform to MPE syntax, enter:

```
STORE ?@/;*T
```

Consult Table 6-1 for a list of wildcard characters and character sets. For additional examples for specifyig file sets, see Table 6-2.

To rename files stored to tape

Occasionally, you may need to rename files as they are stored to tape. For example, renaming files is necessary when the accounting structure of the *source* machine (the computer where the files are being copied from) is different from that of the *target* machine (the computer where the files are being copied to). To do so, you can use the RENAME parameter of the STORE command.

To copy and rename a file from a source system to tape, create a file equation and specify the *source* file set (those files on the source system) and the *target* file set (those on the target system) as shown below.

```
FILE T;DEV=TAPE
STORE source = target : creator;*T;RENAME
```

You may specify the file sets using either MPE or HFS syntax. For more information on renaming files, refer to Volume II of the *MPE/iX Commands Reference Manual Volumes 1 and 2* (32650-90003 and 32650-90364).

To exclude subset files

At times it may be easier to describe the set of files you want to store as a large set minus a certain subset. For example, suppose you want to store all files in all groups of the PERSONEL account except the files in the FORMS group. Describe the set of files to store as shown in the following example:

```
FILE T;DEV=TAPE
STORE @.@.PERSONEL - @.FORMS.PERSONEL;*T
```

Note

When you use the minus sign (-) to indicate a set of files to exclude, you *must* precede and follow it with a space. Otherwise, MPE/iX will interpret it as part of the preceding file name, since the minus sign is a valid character in HFS syntax.

You can describe as many excluded subsets for a set of files as you need (unless you are creating an MPE V/E store tape, which allows only one excluded subset). For example, to store all files in the `PERSONEL` account except the files in the `FORMS` and `RECORDS` groups, enter:

```
FILE T;DEV=TAPE
STORE @.@.PERSONEL -@.FORMS.PERSONEL -@.RECORDS.PERSONEL;*T
```

For more information about MPE V/E store tapes, read "To create MPE V/E compatible STORE tapes" later in this chapter.

Another way you can use excluded subsets is to store all files and directories that are outside of MPE syntax (that is, create a tape with only HFS-syntax files and directories on it). To do so, enter:

```
FILE T;DEV=TAPE
STORE / - @.@.@;*T
```

To store multiple sets of files

Store multiple sets of files the same way that you store more than one individual file. Separate the file sets with commas in your `STORE` command. For example, to store all files in the `PERSONEL` account except the files in the `FORMS` group and all files in the `PAY` group of the `ACCTG` account, enter:

```
FILE T;DEV=TAPE
STORE @.@.PERSONEL-@.FORMS.PERSONEL,@.PAY.ACCTG;*T
```

To store files according to dates

Use the `DATE` parameter to store only files that have not been accessed since a certain date. This enables you to do, among other things, a partial system backup. For example, suppose a full system backup was performed on May 30, 1994. The following `STORE` command would copy all system and user files modified since that date:

```
FILE T;DEV=TAPE
STORE /;*T;DATE<=05/30/94
```

You must enter the date in the mm/dd/yy format (as shown above) or as mm/dd/yyyy (for example, 05/30/1994). The files stored include any that were modified on the same date as the date entered, and those modified since the specified date on nonsystem volume sets that are online.

Use this form of the `DATE` parameter when you perform regular backups of a file set. For example, store the entire set (a full backup) once a week and store only those files modified since the full backup on all other days.

To store files after a certain date

You can also use the DATE parameter to store only files that have not been accessed since a certain date. For example:

```
FILE T;DEV=TAPE
STORE /SYS/OPERATOR/@;*T;DATE<=05/30/94
```

You may enter the year as two digits or four digits (94 or 1994). You may want to use this form of the DATE parameter with the PURGE parameter to remove out-of-date files from your system. Refer to the next section for more information.

To remove stored files from the system: archiving files

If your system contains infrequently used or out-of-date files, you can store them onto tape and permanently remove them from the system disks at the same time. This process, called archiving files, increases available space and provides a backup copy of the files in case you need them in the future.

To store disk files to tape and then delete the disk files in a single operation, use the PURGE parameter of the STORE command. For example, to copy all files in the OLD group of the account ACCTG to tape and delete the files from disk, enter:

```
FILE T;DEV=TAPE
STORE @.OLD.ACCTG;*T;PURGE
```

PURGE deletes the files only after it has successfully stored all of them. Thus, if STORE terminates in the middle of the process, it does not purge any files.

You can combine the DATE and PURGE parameters to archive unused files periodically. For example, the following STORE command stores to tape all files in the **personnel** directory that have not been accessed since September 2, 1994, and then deletes the disk files:

```
FILE T;DEV=TAPE
STORE /personnel/@;*T;DATE<=09/02/94;PURGE
```

To use the PURGE parameter with a privileged file or files, you must have system manager (SM), system supervisor (OP), or privileged mode (PM) capability. PURGE requires you to have write access to the file in order to purge it.

You may want to warn users before you archive files and inform them how to request to have archived files restored. If you need to restore purged files to the system, you can find them on the tape to which you stored them and on the tapes from the last full system backup you performed before you purged the files.

To create MPE V/E compatible STORE tapes

Use the `TRANSPORT` parameter of `STORE` to create STORE tapes that are compatible with MPE V/E. For example, to store all of the files in the `PERSONEL` account onto an MPE V/E compatible tape, enter:

```
FILE T;DEV=TAPE
STORE @.@.PERSONEL;*T;TRANSPORT
```

You cannot use HFS syntax to specify the file set when you use the `TRANSPORT` parameter.

The tape that is produced with the `TRANSPORT` parameter uses the same format as MPE V/E STORE tape format. Therefore, files that are not compatible with MPE V/E (due to file/record size limitations or new file types), are not stored if `TRANSPORT` is specified. Also, the `TRANSPORT` parameter is not valid if `DIRECTORY`, `ONVS`, or `FCRANGE` is specified.

By default, MPE V/E stores a maximum of 4000 files at a time. If you are storing more than 4000 files using the `TRANSPORT` parameter, use the `FILES=` parameter to specify the maximum number of files to be stored. If you do not use the `TRANSPORT` parameter, the `FILES=` parameter is not necessary; if included, it is ignored. For example, to set the maximum number of files stored to 6000 for a `TRANSPORT` tape, you might enter the following:

```
FILE T;DEV=TAPE
STORE @.OPERATOR.SYS;*T;TRANSPORT;FILES=6000
```

You cannot use the character set specifications shown in Table 6-1 with the `TRANSPORT` parameter.

Use the MPE V/E `RESTORE` command to restore files from MPE/iX TRANSPORT tapes to an MPE V/E system. On restore, the backup system automatically detects a TRANSPORT tape and performs the necessary file format translation.

To store files from volume sets

To store the files on a particular volume set, use the `ONVS` parameter of the `STORE` command. `ONVS` lets you store files from as many as 20 volume sets at once. For example, to store all files from the nonsystem volume sets named `VOL_SET_A` and `VOL_SET_B`, enter:

```
FILE T;DEV=TAPE
STORE /;*T;ONVS=VOL_SET_A,VOL_SET_B
```

To store files from system and nonsystem volumes, include the system volume set name within the `ONVS` parameter. For example:

```
FILE T;DEV=TAPE
STORE @.@.@;*T;ONVS=MPEXL_SYSTEM_VOLUME_SET,&
VOL_SET_A,VOL_SET_B
```

Listing the Files Stored

Whenever you store a set of files, the system displays the total number of files stored at your terminal. If there was an error, it also displays the number and names of files not stored and the reason each was not stored. Use the SHOW parameter and its options to display the names and additional information about the files stored and to list them on your system printer as well as at your terminal.

Internally, the STORE program writes information about the files it stores to a file with the formal file designator SYSLIST. It prints file information at your terminal by equating SYSLIST with the standard listing device for your session (your terminal). You can redirect the file information to another file or device by issuing a FILE command that assigns SYSLIST to that device or file. For example, you might want to redirect the file information to a disk file so that you can keep it online for your records.

To write STORE information to the disk file, SHOWFILE, enter:

```
:FILE SYSLIST=SHOWFILE;DEV=DISC
```

To print information on the files you stored at the system printer as well as at your terminal, use the SHOW=OFFLINE option:

```
:FILE T;DEV=TAPE
:STORE @.OPERATOR.SYS;*T;SHOW=OFFLINE
```

To redirect the OFFLINE listing to another file or device, issue the following FILE command. It will send a copy of the STORE listing to the disk file SHOWOFFL:

```
:FILE OFFLINE=SHOWOFFL;DEV=DISC
```

To generate a store listing to the terminal as well as to a disk file, enter the previous FILE command followed by the STORE command:

```
:STORE @.OPERATOR.SYS;*t;SHOW=OFFLINE
```

To use a long or short file display

The STORE command gives you two options for displaying additional information about the files stored. Using the SHOW parameter, you can choose to display file information in either long or short form.

A short file display prints the file's full name, volume restrictions, number of sectors, file code, and media number for each file you store.

In addition to there being a long and a short SHOW listing, there are also two different versions of each: MPE and HFS. The type of listing printed depends on the input file set list. You will get a HFS style listing if:

■ At least one file in the file set list is specified in HFS syntax.

■ A file set wildcard is expanded to include a HFS syntax file.

The HFS style listing contains the same information as the MPE style listing. The only difference is that the file name is printed as an absolute pathname at the end of the line.

Since HFS pathnames can be of variable length, and can be quite long, they are placed at the end of the line so that they will not affect the spacing of the other columns. If the name does not fit on one line, it will be wrapped to the next line. An asterik (*) will be placed at the last column of the line to indicate that the rest of the filename will continue on the next line.

Note
It is most likely that a `STORE` with the file set `@.@.@` will result in a HFS format listing, since MPE/iX, by default, contains some HFS syntax files.

To display the list of files stored using the short form in MPE format, use the `SHOW=SHORT` option in your `STORE` command. For example:

```
:FILE T;DEV=TAPE
:STORE @.PUB.TEST;*T;SHOW=SHORT
```

Figure 6-1 illustrates the output of this command in MPE format.

```
FILENAME GROUP ACCOUNT  VOLUME RESTRICTIONS   SECTORS CODE MEDIA

FILE1    .PUB  .TEST    DISC            :C    1104    1
FILE2    .PUB  .TEST    DISC            :C    0       1
FILE3    .PUB  .TEST    DISC            :C    32      1
```

Figure 6-1. Short File Display (MPE Format)

To store the same file set using HFS syntax:

```
:FILE T;DEV=TAPE
:STORE /TEST/PUB/@;*T;SHOW=SHORT
```

Figure 6-2 illustrates the output in HFS format:

```
VOLUME RESTRICTIONS SECTORS CODE MEDIA FILENAME

DISC           :C   1104    1             /TEST/PUB/FILE1
DISC           :C   0       1             /TEST/PUB/FILE2
DISC           :C   32      1             /TEST PUB/FILE3
```

Figure 6-2. Short File Display (HFS Format)

The command specifies the file set in HFS syntax and how the names are wrapped in the resulting output when they cause the line to exceed 80 characters:

```
:FILE T;DEV=TAPE
:STORE /usr/lib/terminfo/e/e[t-z]@;*T;SHOW=SHORT
```

```
VOLUME RESTRICTIONS   SECTORS CODE MEDIA FILENAME

DISC            :C   256     1             /_HFSACCT/_HFSGRP/HFSMAP
DISC            :C    16     1             /usr/lib/terminfo/e/ethern*
et
DISC            :C    16     1             /usr/lib/terminfo/e/ex3000
DISC            :C    16     1             /usr/lib/terminfo/e/exidy
DISC            :C    16     1             /usr/lib/terminfo/e/exidy2*
500
```

Figure 6-3. Short File Display with Wrapped HFS Names

A long file display in native mode contains the same information as a short file display plus each file's ending media number, record size, blocking factor, maximum number of extents allowed, end-of-file, and file record limit.

Once again, there are two formats for the long listing, MPE and HFS. The HFS format contains the same information as the MPE format, except that the variable-length HFS filename is at the end of the line. It will be wrapped in the same was as the short listing if the file name length exceeds the line length.

To display the list of files stored using the long form in MPE format, use the SHOW=LONG option. For example:

```
:FILE T;DEV=TAPE
:STORE @.PUB.TEST;*T;SHOW=LONG
```

Figure 6-4 illustrates the output using the long file display.

```
   FILENAME GROUP  ACCOUNT  VOLUME  RESTRICTIONS  SECTORS  CODE MEDIA_NUM RSIZE BFCTR #EXT  EOF LIMIT

   FILE1  .PUB   .TEST   DISC       :C      1104    1 - 1  80       16    0    3500 3500
   FILE2  .PUB   .TEST   DISC       :C         0    1 - 1  72        3    1       0    0
   FILE3  .PUB   .TEST   DISC       :C        32    1 - 1  72        1    2     111  112
```

Figure 6-4. Long File Display (MPE Format)

Figure 6-5 illustrates the same information as the preceding figure, except that the file names appear in HFS syntax:

```
VOLUME RESTRICTIONS  SECTORS CODE MEDIA_NUM RSIZE BFCTR #EXT EOF LIMIT FILENAME

DISC          :C     1104   1 - 1       80   16   0    3500 3500   /TEST/PUB/FILE1
DISC          :C        0   1 - 1       72    3   1       0    0   /TEST/PUB/FILE2
DISC          :C       32   1 - 1       72    1   2     111  112   /TEST/PUB/FILE3
```

Figure 6-5. Long File Display (HFS Format)

If you use the `SHOW` parameter without specifying either `LONG` or `SHORT`, the system displays files in short form when the record size of the output device or file (`SYSLIST`) contains fewer than 132 characters in native mode and 114 characters in transport mode. The system displays files in long form when the record size is equal to or greater than 132 characters in native mode and equal to or greater than 114 characters in transport mode.

You can combine either `LONG` or `SHORT` with any of the other `SHOW` options, except path, but you cannot specify both `LONG` and `SHORT` at the same time within a `STORE` command.

To display file dates   To display each file's creation date, last access date, and last modification date for the files stored, use the `SHOW=DATES` option. For example:

```
:FILE T;DEV=TAPE
:STORE @.PUB.DOC;*T;SHOW=DATES
```

Figure 6-6 illustrates the file listing:

```
FILENAME GROUP    ACCOUNT   VOLUME RESTRICTIONS   SECTORS CODE MEDIA
         CREATED     ACCESSED    MODIFIED

FILE1    .PUB    .TEST    DISC           :C      1104         1
         1/12/1994  1/12/1994  1/12/1994

FILE2    .PUB    .TEST    DISC           :C         0         1
         1/12/1994  1/12/1994  1/12/1994

FILE3    .PUB    .TEST    DISC           :C        32         1
         1/12/1994  1/12/1994  1/12/1994
```

Figure 6-6. File Date Information (MPE Format)

When the output listing is in HFS format, an additional field is added to the dates display. The STATE_CHANGE field indicates the last date that a file attribute was changed. An example listing is:

Figure 6-7 illustrates the file listing from the preceding command example in HFS format.

```
VOLUME RESTRICTIONS  SECTORS CODE MEDIA FILENAME
     CREATED ACCESSED MODIFIED STATE_CHANGE

DISC           :C       1104      1          /TEST/PUB/FILE1
     1/12/1994  1/12/1994  1/12/1994  1/12/1994


DISC           :C          0      1          /TEST/PUB/FILE2
     1/12/1994  1/12/1994  1/12/1994  1/12/1994


DISC           :C         32      1          /TEST/PUB/FILE3
     1/12/1994  1/12/1994  1/12/1994  1/12/1994
```

Figure 6-7. File Date Information (HFS Format)

To display file security information

To display file security information for the files stored, use the SHOW=SECURITY option. The listing includes the file creator's user and account name, the security matrix, and a flag indicating the presence or absence of an ACD. The HFS format displays the same security information. For example:

```
:FILE T;DEV=TAPE
:STORE @.PUB.TEST;*T;SHOW=SECURITY
```

Figure 6-8 illustrates a file listing with security information from the above example.

```
FILENAME GROUP   ACCOUNT   VOLUME RESTRICTIONS   SECTORS CODE MEDIA
FILE1    .PUB    .TEST     DISC           :C       1104      1
  LAURA .STSUPPNM  (R:ANY; A:ANY; W:ANY; L:ANY; X:ANY) *ACD EXISTS*

FILE2    .PUB    .TEST     DISC           :C          0      1
  LAURA .STSUPPNM  (R:ANY; A:ANY; W:ANY; L:ANY; X:ANY) *ACD ABSENT*

FILE3    .PUB    .TEST     DISC           :C         32      1
  LAURA .STSUPPNM  (R:ANY; A:ANY; W:ANY; L:ANY; X:ANY) *ACD ABSENT*
```

Figure 6-8. File Security Information

To display names only

The `SHOW=NAMESONLY` allows an abbreviated listing to be displayed. The only fields shown are the starting and ending media number, and the name of the file. This option is most useful when displaying HFS syntax files. Since they can be longer than MPE syntax names, it is sometimes useful to allow more room on the line to display the full pathname. `NAMESONLY` cannot be used with the `SHORT` or `LONG` options to `SHOW`. It has a slightly different format for MPE and HFS. The HFS style has the filename as the last field, while the MPE style has the filename as the first field.

Figure 6-9 is an example for HFS format.

```
MEDIA_NUM FILENAME
1 - 1 /_HFSACCT/_HFSCRP/HFSMAP
1 - 1 /usr/lib/terminfo/e/ethernet
1 - 1 /usr/lib/terminfo/e/ex3000
1 - 1 /usr/lib/terminfo/e/exidy
1 - 1 /usr/lib/terminfo/e/exidy2500
```

Figure 6-9. Names Only Format

To force the HFS format

If you specify `SHOW=PATH` is the `STORE` command line, the output listing will be in HFS format, even if no HFS syntax files are being stored. You may want to use this so that all of your listings appear in the same format.

System Directory Backup

The system directory keeps track of the accounts, groups, users, and files in your system. Nonsystem volume set directories keep track of the contents of nonsystem volumes. When you back up either type of volume, you should store its directory information so that you can rebuild your system from backup tapes in the event of an unexpected data loss.

To store system directory information

The `DIRECTORY` parameter of the `STORE` command allows you to back up the account structure and all HFS directories on system and/or nonsystem volume sets. You may then reload the account structure and HFS directories in the event of a system disaster by restoring them onto the system from the backup media. You have the added flexibility of backing up the directories of nonsystem volumes as a part of or as a separate entity from the system. This allows a nonsystem volume to become a separate reliable entity. System supervisor (OP) or system manager (SM) capability is required to use the `DIRECTORY` parameter.

To store directory information on system volumes, use the `DIRECTORY` parameter of the `STORE` command. For example:

```
FILE T;DEV=TAPE
STORE /;*T;DIRECTORY
```

To store nonsystem volume set directory information, use `DIRECTORY` and `ONVS` in the same command. For example:

```
FILE T;DEV=TAPE
STORE /;*T;ONVS=VOL_SET_A;DIRECTORY
```

The example below shows how to back up the system directory and all other files *and* a nonsystem volume set directory (`NV1`) and its files:

```
FILE T;DEV=TAPE
STORE /;*T;DIRECTORY;ONVS=MPEXL_SYSTEM_VOLUME_SET,NV1
```

Improving Storing Efficiency by Increasing Record Size

Files are stored with the greatest efficiency by using the maximum tape record (buffer) size allocated to a given backup device. Performance increases because data transmission is more efficient and because the amount of media used for interrecord gaps decreases.

The maximum tape record size of MPE/iX supported backup devices differs from device to device and is shown in Table 6-2 below:

Table 6-3. Maximum Tape Record Sizes

Tape Drive	Record Size
HP 7974	16 Kbytes
HP 7978A	16 Kbytes
HP 7978B	32 Kbytes
HP 7979	32 Kbytes
HP 7980(XC,S,SX)	32 Kbytes
DDS(all)	32 Kbytes
3480	32KB
MO	32KB

`STORE` uses a default record size of 16 kilobytes. To use the maximum record size of the device instead, specify the `MAXTAPEBUF` parameter of the `STORE` command.

Note	Do not use the `MAXTAPEBUF` parameter with a backup device of 32-kilobyte record size if you anticipate restoring the tape to a backup device whose maximum record size is 16 kilobytes.

Using Indirect Files

If you store the same information to tape regularly, you might keep the `STORE` parameters and options you use in an indirect file. When you issue the `STORE` command, you simply reference the indirect file, rather than typing all of the necessary information on the command line.

An indirect file is a text file containing the file set and the parameters for a `STORE` command. It must be an existing permanent or temporary file with a record length between 8 and 255 bytes. Read access must be allowed, although the file may be open, shared, or intrajob.

To use an indirect file

Suppose you regularly back up all the files on your system, including the system directory and nonsystem volume set and its directory. The usual `STORE` command might be this:

```
STORE @.@.@;*T;DIRECTORY;ONVS=MPEXL_SYSTEM_VOLUME_SET,NV1
```

If you enter these parameters in a text file, give it an easy name to remember (`BACKUP1` in the example below), and then reference the file in the `STORE` command, you can save time and effort. For example:

```
:EDITOR
/ADD
@.@.@;DIRECTORY;ONVS=MPEXL_SYSTEM_VOLUME_SET,NV1
/KEEP BACKUP1
/EXIT
```

To tell `STORE` that you're using an indirect file, precede the file name with the caret (^).

```
STORE ^BACKUP;*T
```

You can also specify multiple indirect files. For example:

```
STORE ^BACKUP1,^BACKUP2;*T
```

Selecting a STORE Error Recovery Method

When STORE encounters an error, it either automatically recovers or terminates, depending upon the nature of the error and the error recovery method you choose.

The following errors always cause STORE to terminate:

■ A command syntax error

■ An error in the file system directory

■ An error opening the tape file or an indirect file (a text file containing STORE command and options; refer to "Using Indirect Files" in the previous section)

Disk read errors

If STORE encounters a disk read error while storing a file, it skips the remainder of that file and sends an error message to the standard listing device describing the native mode offset from the start of the file and the number of bytes that have been lost. STORE then continues to copy the remainder of the files onto the tape. The STORE operation does not terminate. Since the files that contain disk errors are not stored, you will not be able to restore them.

Tape error recovery

The STORE command's ONERROR parameter lets you specify a tape error recovery procedure. Your options are ONERROR=QUIT and ONERROR=REDO.

■ QUIT instructs STORE to abort upon encountering a tape I/O error.

■ REDO instructs STORE to continue after encountering an I/O error. REDO is the default option.

If you specify REDO and the STORE command encounters a tape I/O error on a device, STORE sends an informational message to your terminal (or the file or device to which you have assigned the file SYSLIST). It rewinds the reel to the load point, marks the reel as bad, and asks you to mount another reel. After you mount the new reel, STORE automatically stores all the files from the point where the bad reel began.

To display native mode messages

STORE displays the following messages during tape error recovery:

The user sees the message:

    STORE ENCOUNTERED MEDIA WRITE ERROR ON LDEV #

The operator sees messages similar to the following:

    STORE IS MARKING REEL BAD ON LDEV #

    MOUNT NEXT REEL FOR STORE ON LDEV #

To check file listings for errors

Use the `SHOW` parameter of the `STORE` command to check file listings for errors. As `STORE` copies files to tape, it will list them on the `SYSLIST` provided you use the `SHOW` parameter. For example, if you enter this:

<u>STORE T@.SREXP.SYS;*T;SHOW</u>

The following might be listed on the `SYSLIST`:

```
STORE/RESTORE VERSION A.21.01   (C) 1986 HEWLETT-PACKARD
CO. TUE, JAN 6, 1990,  2:57 PM

FILENAME GROUP   ACCOUNT   VOLUME RESTRICTIONS       SECTORS CODE    REEL
TDORSERR.SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S    32            1
TSRBUGFX.SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S   160            1
TSRDOC  .SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S   672            1
TSRERR  .SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S   240            1
TSRGLOB .SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S    64            1
TSRINCL1.SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S   656            1
TSRINCL2.SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S   480            1
TSRINCL3.SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S   272            1
TSRTAPE .SREXP  .SYS       MPEXL_SYSTEM_VOLUME_SET  :S   384            1

FILES STORED:   9
```

When STORE finishes, you see the total number of files stored and if there is an error, the number not stored. Use the listing to verify that the correct files were indeed stored and that none were omitted.

To verify that STORE files are error free

After using the STORE program to write files to tape, you may want to check to be sure that no errors occurred in the process. The `VSTORE` command allows you to verify that any or all the files were correctly stored. `VSTORE` can also be used to verify the file system directory or to list the date that a given file was stored.

To verify one or more files on a STORE tape, mount the tape on your backup device, as described in chapter 8. (The write ring should be removed as a protection.) Put the device online.

As with the `STORE` and `RESTORE` commands, you should precede the `VSTORE` command with a `FILE` command, assigning a file name to the tape drive. If you do not assign a file name, a default name is utilized based on your username.

For example, to verify the files on a tape enter:

```
FILE T;DEV=TAPE
```

Now issue a VSTORE command that backreferences the tape file and includes the file or files you want to verify. For example,

```
VSTORE *T;/
```

If you have omitted the FILE command, you would enter

```
VSTORE ;/
```

In addition to the tape file name and the names of the files to be verified, four parameters are available: SHOW, ONERR[OR], LOCAL, and DIRECTORY. The following is a brief description of each of these parameters:

■ Use the SHOW parameter to list the names of each file successfully verified. (If you do not specify this parameter, the total number of files verified is displayed.) Additional options used with the SHOW parameter include short and long form descriptions of files, creation, last access, and last modification date, security status, and an offline printing option.

■ Use the ONERR[OR] parameter to inform VSTORE what to do upon encountering an error within a file. In addition to the QUIT option, which causes the verification process to quit when an error is encountered, you have a second option, SKIP, that allows verification to proceed after skipping a faulty file. SKIP is the default.

■ Use the DIRECTORY parameter to verify the file system directory on the tape. Use of this parameter requires SM or OP capability.

The following are examples of the above parameters:

```
VSTORE *T;/;SHOW
VSTORE *T;FILE1.MANAGER.SYS;SHOW;ONERR=SKIP
VSTORE *T;/;DIRECTORY
```

The VSTORE command is not valid for a STORE tape created with the TRANSPORT parameter.

For a full discussion of all VSTORE command options, refer to the *MPE/iX Commands Reference Manual* (32650-90003).

To retain the STORE tapes

Unload each tape and check for correct labeling. If you used the SHOW=OFFLINE option of the STORE command, the system has printed a list of the files you stored. Retrieve the report from your printer and either file it with your records or attach it directly to one or more tape reels. Place each tape in your tape library.

To allow users back on the system

If you prevented users from accessing the system during your backup, as discussed in chapter 8, "Backing Up the System," you need to allow users to access the system again. Here are the steps to follow:

1. Reset the job and session limits to their original values. Enter:

    LIMIT nn,nn

2. To check that you've used the correct numbers, enter:

    SHOWJOB STATUS

    The last line should report the correct job limit (JLIMIT) and session limit (SLIMIT) for your computer. If the values are incorrect, enter the LIMIT command again with the corrected values.

3. Reset the system jobfence to its original value by entering:

    JOBFENCE nn

4. To check that the jobfence is correct, enter:

    SHOWJOB STATUS

5. Restart any suspended jobs. To determine whether any jobs had been temporarily stopped, enter:

    SHOWJOB

    The system lists your session and any suspended jobs in the following way:

```
JOBNUM     STATE    IPRI JIN      JLIST      INTRODUCED   JOB NAME
#S185      EXEC          20       20         FRI  1:03P   OPERATOR.SYS
#J17       SUSP          10S      PP         FRI  5:02P   AJOB,MRS.T
2 JOBS:
   0 INTRO; 0 SCHEDULED
   0 WAIT; INCL 0 DEFERRED
   1 EXEC; INCL 1 SESSIONS
   1 SUSP

JOBFENCE= nn; JLIMIT= nn; SLIMIT= nn
```

The example shows one suspended job (#J17). To restart that job, enter:

    RESUMEJOB #J17

Repeat the RESUMEJOB command for each job listed as SUSP.
When you have done this for each suspended job, check that all
jobs have been restarted by entering:

SHOWJOB

The list should look nearly identical, except that jobs that were
suspended before should now be listed as executing or EXEC:

```
JOBNUM    STATE   IPRI JIN    JLIST     INTRODUCED  JOB NAME
#S185     EXEC         20     20        FRI  1:03P  OPERATOR.SYS
#J17      EXEC         10S    PP        FRI  5:02P  AJOB,MRS.T


2 JOBS:
   0 INTRO; 0 SCHEDULED
   0 WAIT; INCL 0 DEFERRED
   2 EXEC; INCL 1 SESSIONS
   0 SUSP
JOBFENCE= nn; JLIMIT= nn; SLIMIT= nn
```

When you have returned the system to its normal status and
restarted suspended jobs, the backup is complete, and users can
begin using the system again.

7

Copying Files from Tape

To copy one or more files stored on a tape to disk, you use the RESTORE command. For example, you might need to restore a single file when a user accidentally deletes it. Or, someone may ask you to restore all the files in an account (after you have permanently archived it and deleted the files) because the user needs access to the files again. After a system failure, you might need to restore all of your files from backup tapes.

In this chapter, you will find the procedures to perform the following tasks:

- Determining what files are on a STORE tape
- Restoring MPE and HFS files
- Restoring files to specific volumes or to a specific device
- Restoring files with a specified file code
- Listing restored files
- Specifying a maximum number of files to restore
- Specifying modification and last access dates
- Restoring directory information
- Using indirect files
- Selecting an error recovery method
- Mounting additional tapes

An Overview of the Restore Process

You use the RESTORE command to copy one or more files from tape to disk. By choosing different RESTORE command options, you can, for example, print a list of all files restored, restore files to a particular volume, restore the system accounting structure, and restore the complete hierarchical directory structure.

Restoring files involves the use of one or more tapes on a backup device. The steps that you follow to complete the process are:

■ locate and prepare the necessary tape or tapes

■ check for duplicate file names

■ issue a FILE command to assign a file name to the tape drive

■ issue a RESTORE command to name the files you want to restore and the options to use

Caution

Do not use the STORE or RESTORE commands to transfer any of the files originally on your system load tape from LDEV 1 to a system disk other than LDEV 1. (These files are contained in the SYS account and can be displayed by entering the SYSFILE configurator of the SYSGEN utility and using the SHOW command.) Also, do not use STORE and RESTORE to manipulate the files within a configuration group. These configuration files come as a set, and moving them between groups or systems makes the files inaccessible which will cause problems immediately or at some future time.

To prepare the tapes

Search your tape library for the STORE tape(s) containing the files you want to restore. If necessary, you can use the LISTDIR parameter of the RESTORE command to list a tape's contents. It displays information from the tape directory and tape label without restoring any files. (The LISTDIR parameter does not work with transport tapes created for MPE V/E.)

For example, to find out if the STORE tape contains any HFS files, enter:

```
RESTORE *T;/ - @.@.@;LISTDIR
```

Chapter 6 discusses how the hierarchical file system affects STORE and RESTORE procedures. Read "To name file sets in MPE and HFS syntax" and "To use wildcard characters in the file set" for more information. For a complete discussion of the hierarchical file system, read *New Features of MPE/iX: Using the Hierarchical File System* (32650-90351).

The example below shows a sample `RESTORE` command and output from the `LISTDIR` parameter:

<u>RESTORE *T;@.SREXP.SYS;LISTDIR</u>

```
STORE/RESTORE VERSION  A.21.01 (C) 1986 HEWLETT-PACKARD
CO. WED, MAR 30, 1990, 10:59 AM

MPEXL MEDIA DIRECTORY


MEDIA NAME    : STORE/RESTORE-HP/3000.MPEXL
MEDIA VERSION : MPEXL 08.50 FIXED ASCII
REEL NUMBER   : 1


MEDIA CREATION DATE
WED, MAR 30, 1990, 10:53 AM


MEDIA CREATED WITH THE FOLLOWING OPTIONS


MEDIA RECORD SIZE : 16384
INTERLEAVE DEPTH  : 1


FILENAME GROUP     ACCOUNT  CREATOR       REEL    SET
TDORSERR.SREXP    .SYS      BOB      >=      1
TSRBUGFX.SREXP    .SYS      BOB      >=      1
TSRDOC  .SREXP    .SYS      BOB      >=      1
TSRERR  .SREXP    .SYS      BOB      >=      1
TSRGLOB .SREXP    .SYS      BOB      >=      1
TSRINCL1.SREXP    .SYS      BOB      >=      1
TSRINCL2.SREXP    .SYS      BOB      >=      1
TSRINLC3.SREXP    .SYS      BOB      >=      1
TSRTAPE .SREXP    .SYS      BOB      >=      1
```

Chapter 6 discusses how the hierarchical file system affects `STORE` and `RESTORE` procedures. Read "To name file sets in MPE and HFS syntax" and "To use wildcard characters and character sets" for more information. For a complete discussion of the hierarchical file system, read *New Features of MPE/iX: Using the Hierarchical File System* (32650-90351).

To check for duplicate file names

Before you restore a file from a STORE tape, check whether a disk file with the same name already exists. If a file with the same name resides in the account and group or in the directory you are restoring to, the disk file is overwritten by the tape file during the RESTORE process by default.

To check for duplicate file names, use the LISTFILE command for each file you intend to restore. Enter:

LISTFILE *filename.groupname.accountname*

Or, to use HFS syntax, enter:

LISTFILE *path/filename*

When you specify the set of files to look for with the LISTFILE command, you can use wildcard characters. For example, to find any files in the PUB group of the RESEARCH account, enter:

LISTFILE @.PUB.RESEARCH

Or, for example, to list all files and directories directly below the current working directory, enter:

LISTFILE ./@

If at least one file exists, the system prints the file name at your terminal. If none exist, the system prints the message NON-EXISTENT FILE (CIERR 907).

Restoring Files

The next sections teach you how to restore:

■ a single file, a group of files, or all files on the STORE tape

■ multiple sets of files

■ all files in a set that you specify, excluding files that you don't want to restore

■ a set of files that share the same file code

To restore a single file

To restore a file from the tape to the system disk, first issue a FILE command to name the backup device and describe its type. (If you do not use a FILE command, RESTORE creates a default file name based on your username.) Then issue a RESTORE command specifying the file you want to restore, any options you want to use, and the backreferences to the file name of the backup device.

For example, to restore the file FILE1 in the group OPERATOR of the SYS account, enter:

FILE T;DEV=TAPE
RESTORE *T;FILE1.OPERATOR.SYS

You may omit the backreference, as shown in the following example. If you do so, you must include the semi-colon ("`;`") to serve as a placeholder.

```
RESTORE ;FILE1.OPERATOR.SYS
```

Or, for example, to restore `my_file` in the directory `my_dir`, enter:

```
RESTORE *T;/my_dir/my_file
```

You must use a `FILE` command if you want the device to be automatically allocated. Refer to "To assign a file name to a backup device" in chapter 6 for more information on the `FILE` command.

To restore several files
To restore two or more files at the same time, list each file in the `RESTORE` command line, and separate the file names with commas. For example, to restore two MPE files, one in the RESEARCH account and one in the ACCTNG account, you would enter:

```
FILE T;DEV=TAPE
RESTORE *T;FILE1.PUB.RESEARCH,FILE2.PUB.ACCTNG
```

Or, to restore the same two files using HFS syntax, you would enter:

```
FILE T;DEV=TAPE
RESTORE *T;/RESEARCH/PUB/FILE1,/ACCTING/PUB/FILE2
```

To use wildcard characters to reference files
To restore all the files in a particular group and account, or all files in a particular directory, use the wildcard character `@` to indicate all the files in the set. For example, to restore all files in `MYGROUP` of the `SYS` account, enter:

```
FILE T;DEV=TAPE
RESTORE *T;@.MYGROUP.SYS
```

When you want to restore all files from a set of STORE tapes, it is best to use `/` (representing "all files") in place of `@.@.@`. For example:

```
FILE T;DEV=TAPE
RESTORE *T;/
```

If you omit a list of files in the `RESTORE` command, MPE/iX restores a file set based on your capabilities. In particular, it restores:

- @.*group.account* for users.
- @.@.*account* for the account manager (AM).
- @.@.@ (or /) for the system manager (SM) and system supervisor (OP).

Note
For complete information about wildcard characters, read "To use wildcard characters and character sets" in Chapter 6.

To use character sets to reference files

You can use a character set, which is a series of characters to substitute for a single character, to name groups of files in the RESTORE command line. For example, to restore all files beginning with the character a, b, c, d, e, or f in the current working directory, enter:

```
FILE T;DEV=TAPE
RESTORE *T;[a-f]@
```

Or, to restore all files ending with e, f, g, or 1 in the current working directory, enter:

```
FILE T;DEV=TAPE
RESTORE *T;@[e-g1]
```

If you are following MPE syntax, you may specify a maximum of 16 characters for each fully qualified file designator part. You cannot nest brackets.

You cannot use character sets when restoring transport tapes.

Note

For complete information about wildcard characters, read "To use wildcard characters and character sets" in chapter 6.

To specify files to exclude

At times it may be easier to describe the set of files you want to restore as a large set minus a certain subset. For example, suppose you want to restore all files in all groups of the PERSONEL account except the files in the FORMS group. Describe the set of files to store as shown in the following example:

```
FILE T;DEV=TAPE
RESTORE *T;@.@.PERSONEL - @.FORMS.PERSONEL
```

You can describe an unlimited number of excluded subsets for a set of files. For example, to restore all files from the PERSONEL account except files in the FORMS and RECORDS groups, enter:

```
FILE T;DEV=TAPE
RESTORE *T;@.@.PERSONEL - @.FORMS.PERSONEL - @.RECORDS.PERSONEL
```

Note

When you use the minus sign (-) to indicate a set of files to exclude, you **must** precede and follow it with a space. Otherwise, MPE/iX will interpret it as part of the preceding file name, since the minus sign is a valid character in HFS syntax.

For transport tapes, you can specify only one excluded subset.

To restore multiple sets of files

You can restore multiple sets of files the same way that you restore more than one individual file, that is, by separating the file sets with commas in RESTORE command line. For example, to restore all files to the PERSONEL account except the files in the FORMS group and to restore all files in the PAY group of the ACCTG account, enter:

```
FILE T;DEV=TAPE
RESTORE *T;@.@.PERSONEL - @.FORMS.PERSONEL,@.PAY.ACCTG
```

Note

When you use the minus sign (-) to indicate a set of files to exclude, you **must** precede and follow it with a space. Otherwise, MPE/iX will interpret it as part of the preceding file name, since the minus sign is a valid character in HFS syntax.

To restore files with specific file codes

MPE/iX file codes distinguish different types of files. Using the FCRANGE parameter of the RESTORE command, you can restore only files with certain file codes. You can select up to eight file code ranges to restore.

For example, the files with codes 1100, 1101, and 1102 are HP WORD files. Files with codes 1152 and 1153 are SLATE files. To restore all HP WORD and SLATE files from a tape, enter:

```
FILE T;DEV=TAPE
RESTORE *T;/;FCRANGE=1100/1102,1152/1153
```

The FCRANGE parameter is not valid when restoring from transport tapes.

To specify a maximum number of restored files

By default, MPE V/E restores a maximum of 4000 files at a time. If you are restoring more than 4000 files using the TRANSPORT parameter, use the FILES= parameter of the RESTORE command to specify the maximum number of files to be restored. If you do not use the TRANSPORT parameter, the FILES= parameter is not necessary; if present, it is ignored.

To set the maximum number of files restored to 6000 from a transport tape enter the following:

```
FILE T;DEV=TAPE
RESTORE *T;@.OPERATOR.SYS;FILES=6000
```

To list restored files

Whenever you restore a set of files, the system displays the total number of files restored at your terminal. If there is an error, it also displays the names of files not restored, the reason each was not restored, and the total number of files not restored . Use the SHOW parameter to display the names and additional information about the files restored and to list them on your system printer as well as at your terminal.

To print information at the system printer as well as at your terminal, use the `SHOW=OFFLINE` option:

```
FILE T;DEV=TAPE
RESTORE *T;@.OPERATOR.SYS;SHOW=OFFLINE
```

Specifying a Destination for the Restored Files

When you restore files from tape to disk, `RESTORE` tries to restore a file to the logical device compatible with the device type and subtype specified in the file's label and the device type and subtype of the mounted home volume set. If it cannot find such a device, `RESTORE` tries to restore the file to a device with the device class specified in the file's label and the home volume set. If it cannot find a device with the appropriate device class, `RESTORE` tries to restore the file to any member of the home volume set; if it cannot, it does not restore the file.

Rather than letting MPE/iX determine the location of the restored files, you can determine where the files are copied. This can include specifying:

- the volume set for the restored files

- the device for the restored files

- the group, account and creator for the restored files

The following sections teach you how to specify the destination of the files you are restoring.

To restore files to a specific volume set

Use the `VOL`, `VOLCLASS`, and `VOLSET` parameters of the `RESTORE` command to restore files to a particular volume, volume class, or volume set. When using these parameters, note the following exceptions:

- You cannot use `VOL`, `VOLCLASS`, or `VOLSET` together with the `DEV` parameter.

- If a file's group and account do not exist on the volume specified with `VOLSET`, the file is restored to the volume set where its group and account do exist.

- The `VOL`, `VOLCLASS`, and `VOLSET` parameters are not valid for restoring files from transport tapes.

Use the `VOLSET` parameter to reference a particular volume set. For example, to restore all the files on the STORE tape to `PRIVATE_VOL_A`, enter:

```
FILE T;DEV=TAPE
RESTORE *T;/;VOLSET=PRIVATE_VOL_A
```

Use `VOLCLASS` to reference a particular volume class. If there is no room in the volume class you indicate, RESTORE restores the files to a volume within the volume set. If there is no room in the volume set, RESTORE does not restore the files. For example, to restore files to the volume class `CLASS_B` within the `PRIVATE_VOL_A` volume set, enter:

```
FILE T;DEV=TAPE
RESTORE *T;/;VOLSET=PRIVATE_VOL_A;VOLCLASS=CLASS_B
```

Use `VOL` to reference a particular volume. If you do not indicate a volume class or volume set, the volume you indicate must be part of the system volume set. If there is no room on the volume you name, RESTORE restores the file to another volume within the volume class. If there is no room within the volume class, RESTORE restores the file to a volume within the volume set. As an example, to restore files to the volume named `VOL_C` within the `PRIVATE_VOL_A` volume set, enter:

```
FILE T;DEV=TAPE
RESTORE *T;/;VOLSET=PRIVATE_VOL_A;VOL=VOL_C
```

Refer to *Volume Management Reference Manual* (32650-90045) for more information on using volumes, volume classes, and volume sets.

To restore files to a specific device

Use the `DEV` parameter of the `RESTORE` command to specify the device to which you want to restore files. You can reference a device either by its LDEV number or its device class. Keep in mind, however, that specifying the logical device number is more specific since more than one disk can belong to the same device class. Note that you cannot use the `DEV` parameter with `VOLSET`, `VOLCLASS`, or `VOL` parameters.

For example, to restore `FILE1` in the group `OPERATOR` of the `SYS` account to LDEV 2, you enter:

```
FILE T;DEV=TAPE
RESTORE *T;FILE1.OPERATOR.SYS;DEV=2
```

Or, to restore all of the files in the `accounting` directory and any files and directories below it to LDEV 2, enter:

```
FILE T;DEV=TAPE
RESTORE *T;/accounting/;DEV=2
```

If you name a device class, RESTORE allocates the files to any of the home volume set's volumes within that class. If you name a specific logical device, RESTORE restores the file to that device only if the device is a system disk.

You cannot use the `DEV` parameter of the `RESTORE` command with `VOLSET`, `VOLCLASS`, or `VOL` parameters.

To restore files to their original group, account, and creator

Files on STORE tapes belong to the same group, account, and creator that they belonged to on disk. You restore files to their original group, account, or creator, or if you have the correct capabilities, you can use `RESTORE` command options to copy a file to your own group and account or to copy a file to a different group, account, or creator. If a file's account, group, or creator have been deleted from your system after storing the file to tape, you can recreate it as you restore the file from tape with the `CREATE` parameter. You must have system manager (SM) or system supervisor (OP) capability to create a new account, and system manager (SM), system supervisor (OP), or account manager (AM) capability to create a new group.

Note

The `RESTORE` command sets account, group, and user capabilities to their default values when it creates them, which may not be the same capabilities they had on the source system.

For example, suppose you stored all files in the account `FEBRECS` to tape on the first of March and then purged the account, its users, and its groups from t he system. Several months later, a user asks you to restore the files in the `FEBRECS` account. Using the `CREATE` parameter, you can recreate the account , groups, and creators as you restore the files. For example:

```
FILE T;DEV=TAPE
RESTORE *T;@.@.FEBRECS;CREATE=GROUP,ACCOUNT,CREATOR
```

Or alternatively, you could enter:

```
RESTORE;;CREATE
```

The default restores all files and creates all missing structures.

To restore files to your group and account

Regardless of the group, account, or creator from which files were stored, you can restore files into your own group and account if you have read access to the files on the tape or if you have system manager (SM), system supervisor (OP), or account manager (AM) capability. ("Read access" above implies that if the files were restored to the groups and accounts from which they came, and those groups and accounts had default access capabilities, you would be able to read the files on disk, such as with FCOPY.)

To use the `LOCAL` parameter to restore all the files on the STORE tape to your own group and account, enter:

```
FILE T;DEV=TAPE
RESTORE *T;/;LOCAL
```

The files will be restored to your logon group and account with your logon user name as the creator.

To restore a file to a different group, account, or creator

You can use the `GROUP`, `ACCOUNT` and `CREATOR` parameters to change a file's group, account, or creator as you restore it from tape. You can use any of the parameters alone or in combination, but you cannot use them with the `LOCAL` parameter. You must have system manager (SM) or system supervisor (OP) capability to change a file's account. You must have system manager (SM), system supervisor (OP), or account manager (AM) capability to change a file's group.

A user with fewer capabilities than described above can restore a file to a different account, group or creator if the following conditions are met:

- The group, account, and file-level access is available to the user.

- The file has no lockword, or if it does, the user knows the lockword.

- The file is not privileged.

For example, to restore the files that belong to the `PUB` group of the `SMITH` account on tape to the `PUB` group of the `JONES` account on disk, enter:

```
FILE T;DEV=TAPE
RESTORE *T;@.PUB.SMITH;GROUP=PUB;ACCOUNT=JONES
```

Or, for example, to restore the files in the `PUB` group of the `SMITH` account on tape to the `PUB` group of the `JONES` account on the system disk, changing the creator to `MARTY`:

```
FILE T;DEV=TAPE
RESTORE *T;@.PUB.SMITH;GROUP=PUB;ACCOUNT=JONES;CREATOR=MARTY
```

You must name a user that exists in the account as the new creator, or specify `CREATE` to have MPE/iX create the user in the directory. If `RESTORE` does not find the user name, it does not restore the file. If you use the `CREATOR` parameter without specifying an existing user name, `RESTORE` restores the file only if the tape file's creator exists in the file system directory.

To restore the hierarchical directory structure

You use the `DIRECTORY` parameter to place the directory structure on tape when you intend to use the tape to reload the system. MPE/iX regenerates the entire hierarchical directory structure before it restores any files. It also restores the system accounting directories for any volume sets saved on the tape. If the STORE tape is missing a directory needed to restore a file, one of two things can happen:

- If you use the `CREATE` option with the `RESTORE` command, all directories matching the specified file set are restored. If the STORE tape is missing a directory that is required to restore a file, MPE/iX creates it with default security provisions.

- If you omit the `CREATE` option, MPE/iX prints an error message for every file that it cannot restore due to a missing directory component. As a result, it restores only those files within the directory structure stored to tape, which prevents previously deleted users, groups, directories or accounts from reappearing on the system.

If you reload your system directory, and you want all of the files outside your system domain to have their corresponding groups, accounts, and creators created, enter the `RESTORE` command as follows:

```
RESTORE *T;/;DIRECTORY;CREATE=GROUP,ACCOUNT,CREATOR
```

Overwriting and Retaining Disk Files

By default, RESTORE will replace any disk files that have the same fully qualified file name as the file you are restoring from tape. If you are restoring a large number of files, be sure that you do not overwrite an important file or files. Use the `KEEP` parameter of the `RESTORE` command.

To retain disk files

Your STORE tape might contain several files, some of which have names that are the same as files on disk. To restore only those tape files with names that do not duplicate disk file names, use the following commands:

```
FILE T;DEV=TAPE
RESTORE *T;/;KEEP
```

Using `KEEP` in the command above tells the system not to replace the files already on disk with those with the identical names on tape. You will successfully restore to disk all files on the tape that do not have the same names as files already on disk.

To overwrite disk files

To explicitly require `RESTORE` to overwrite disk files that have the same fully qualified file names, use the `NOKEEP` parameter in your `RESTORE` command. For example:

```
FILE T;DEV=TAPE
RESTORE *T;/;NOKEEP
```

Specifying Modification and Last Access Date

When you restore a file or files, you can choose either to retain the modification date and last access date stored with the file on tape or to change the file's modification date and last access date to the date you restored the file.

To retain the dates

To retain the modification and last access date in the file label on tape, use the `OLDDATE` parameter of `RESTORE`. Enter:

```
FILE T;DEV=TAPE
RESTORE *T;/;OLDDATE
```

To change the dates

To change the modification and last access date to the date you restored the files, use the `NEWDATE` parameter. For example:

```
FILE T;DEV=TAPE
RESTORE *T;/;NEWDATE
```

It is a good idea to use `NEWDATE` when you restore archived files, so that you do not archive them again in the near future. `NEWDATE` is the default.

Listing Restored Files

Whenever you `RESTORE` a set of files, the system displays the total number of files restored at your terminal. If there was an error, it also displays the names of files not restored, the reason each was not restored, and the total number of files not restored. Use the `SHOW` parameter to display the names and additional information about the files restored and to list them on your system printer as well as at your terminal.

The output listings appear in the same format as they do for the `STORE` command. Refer to Chapter 6 for information on the SHOW options, as well as the format and fields in the listings.

Using Indirect Files

If you restore the same information regularly, you might keep RESTORE parameters and options that you use in a text file, and then refer to that file when you issue the command. This way, you can quickly perform the same restore procedure on a regular basis, without needing to remember all of the specific information the RESTORE command requires.

To use an indirect file:

1. Using a text editor, create a file that specifies the file set and parameters you want to execute with the RESTORE command.

2. Save the file with a meaningful name so that you can easily remember it.

3. Reference the indirect file in the RESTORE command line. For example, the following RESTORE command references an indirect file named BACKUP:

    RESTORE *T;^BACKUP

For more information on indirect files see "Using Indirect Files" in chapter 6, "Copying Files to Tape."

Selecting a RESTORE Error Recovery Method

As RESTORE restores files from tape, it displays the number of files restored and not restored, and the names of files not restored, if any. The RESTORE message also explains why each file was not restored. Such errors do not necessarily abort the RESTORE process. When RESTORE encounters an error, it either automatically recovers or terminates, depending upon the nature of the error and the error recovery method you choose.

The following errors always cause RESTORE to abort:

■ A command syntax error.

■ A disk input or output error (in the system).

■ An error opening the tape file or an indirect file. (Refer to "Using Indirect Files," in the previous chapter.)

■ An incorrectly formatted STORE tape.

■ No continuation reel; you did not find a continuation reel for a multireel tape set.

■ A device reference error; either the specification for the device parameter is illegal, or the device is not available.

The ONERROR parameter of the RESTORE command lets you choose a recovery procedure when it encounters a device read error. Your options are ONERROR=QUIT (which is the default) or ONERROR=SKIP. You must include the ONERROR parameter only if you do not wish to use the default.

To stop RESTORE upon an error

To request that RESTORE terminates upon encountering a tape error, enter:

```
RESTORE *T;@.PUB.SMITH;ONERROR=QUIT
```

To continue RESTORE regardless of errors

To request that error-causing files are skipped during RESTORE and that the RESTORE continues use the SKIP option of ONERROR. Enter:

```
RESTORE *T;@.PUB.SMITH;ONERROR=SKIP
```

Mounting Additional Tapes

If you are restoring a large set of files, the set may extend on to several tapes. If you have more than one tape to mount on a backup device, RESTORE immediately prompts you to mount the next tape after it finishes restoring files from the previous tape. You will see messages similar to the ones below:

```
15:28/#S415/59/MOUNT NEXT REEL FOR STORE ON LDEV 8
15:29/#S415/59/LDEV #8 NOT READY
```

To mount additional tapes:

1. Unload the first tape. (If necessary, read chapter 1 for instructions.)

2. Locate the second tape, prepare it, and mount it.

3. Continue monitoring the RESTORE process. Mount new tapes as the system requests them.

Note

The system automatically continues restoring files as you mount additional tapes. It isn't necessary to issue another RESTORE command or respond to a tape request. However, if you need to leave the console while restoring files, other messages can cause mount requests to scroll off the console screen. Use the RECALL command to redisplay mount requests.

8

Backing Up the System

Planning, managing, and performing system backups are, perhaps, a system operator's most important tasks. Regularly scheduled, properly performed system backups guarantee that, in the event of an unexpected system mishap, the information from the most recent backup is always available.

Computer users can choose to store their own files whenever they want, but they also rely on you to maintain a current set of duplicate files by copying the most up-to-date information stored from your computer's disk to tapes.

There are two ways to perform a system backup. A full backup copies all files stored in your system, whether or not any of the information in them has changed since the last backup. A partial backup copies only the files that have changed since the last full backup, using the `DATE` parameter of the `STORE` command. A well-planned backup schedule combines both methods. It usually calls for a full backup once a week and a partial backup each remaining workday. If you follow such a schedule, you lose no more than 24 hours worth of information should the system fail.

In this chapter, you will find the procedures to perform the following tasks:
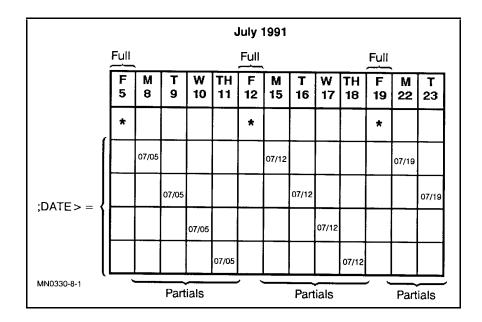
- Scheduling backups
- Preparing for the backup
- Performing full backups
- Performing partial backups
- Using system directory backups

Scheduling Backups

Your backup schedule should cause the least inconvenience to your computer users:

- Backups should be done when no one is using the computer.

- Full backups, which take more time and more tapes than partial backups, should be carefully planned.

Scheduling the backup for the end of the work day is usually best. It's also a good idea to plan the backup for the same time every day. This way, everyone knows what to expect and can plan their own schedules accordingly.

Performing a partial backup the day after a full backup requires less time (and fewer tapes) than the partial backup almost a week later. As the week progresses, computer users modify and add more files since the last full backup, so more new information exists to backup.

If you schedule full backups for Fridays, you may only need one tape and a little bit of time for your first partial backup on Monday. But, by Thursday, the day before the full backup, plan on using several tapes and spending a lot more time backing up the computer.

If you perform a full backup daily, the time it takes and the number of tapes needed remain more predictable.

Preparing For the Backup

A file cannot be backed up while someone is adding to or changing information. For this reason, everyone should save their files before you begin the backup.

Preparing for a backup is very similar to preparing for a system shutdown: the object is to stop nearly all computer activity, and, in particular, to prevent people from using the computer.

When you are through with the backup, you have a set of labeled tapes containing the most current computer information.

To prepare for the backup

To prepare for the backup, you need the following things:

■ Tapes (reel or DDS). The number of tapes you need depends upon whether you are doing a full or partial backup, and how much information your computer stores.

■ Write rings for each reel tape you are using.

■ Tape labels for each tape you use.

Performing a Full Backup

A full backup should not be a surprise. Follow a schedule and communicate it to your users in the WELCOME message.

To prepare for a full backup

About 15 minutes before you want to start the backup, tell everyone to finish their work and log off. Enter the following message at the console. (Do not press [Return] until you have typed the entire message. Otherwise, everyone gets only part of it.)

1. Use the TELL command. Enter:

   TELL @S; BACKUP WILL BEGIN IN 15 MINUTES.

   PLEASE FINISH AND LOG OFF;

   INFORM YOUR QUIET NEIGHBORS [Return]

   If you did accidentally enter the [Return] key too soon, just start all over again. Refer to chapter 5, "Performing System Functions."

2. Prevent anyone who is not currently using the computer from logging on. Enter:

   LIMIT 0,0

   JOBFENCE 14

3. Check the new limits and jobfence by entering:

   SHOWJOB STATUS

The values on your console should exactly match the ones here. If they do not, enter the above commands again.

```
JOBFENCE= 14; JLIMIT= 0; SLIMIT= 0
```

4. About 10 minutes before you plan to begin the backup, send everyone a warning. (Remember, do not press (Return) until you enter the entire message.) Regardless of what users are doing, they receive the warning at their terminals. Enter:

```
WARN @S; BACKUP WILL BEGIN IN TEN MINUTES.
```

```
PLEASE LOG OFF. (Return)
```

5. Find out who is still using the computer by entering:

```
SHOWJOB JOB=@S
```

The computer responds by listing all sessions. Since you have already told people about the backup once, and warned them again just a minute ago, they should log off soon. Periodically use the **SHOWJOB** command to see who is still working. Another warning may be necessary.

6. Suspend any executing jobs. First enter:

```
SHOWJOB JOB=@J
```

If you see one or more executing jobs, suspend them before the backup begins. Use the job numbers that appear in the first column on your screen with the **BREAKJOB** command:

```
BREAKJOB #Jnnn
```

Replace *nnn* with a job number from your screen

Repeat the **BREAKJOB** command for each executing job in the list. When you are finished, enter:

```
SHOWJOB JOB=@J
```

Each job should now be listed as "**SUSP**," or suspended. If you missed one, use the **BREAKJOB** command again to suspend it.

When you finish the backup, you need to restart any suspended jobs.

To perform a full backup

1. Define the backup device with the `FILE` command. Enter:

       FILE T;DEV=TAPE

   Or use the logical device number. For example:

       FILE T;DEV=8

2. Enter a `STORE` command with your options. For example, to store all files on the system, including HFS files and directories, enter:

       STORE /;*T;SHOW=OFFLINE;PROGRESS-1;DIRECTORY

In addition to copying all system and user files, the `STORE` command in the example above prints a list of the stored files on the system printer, notifies you of its progress every minute, and copies the file system directory.

To perform a partial backup

1. Define the backup device with the `FILE` command. Enter:

       FILE T;DEV=TAPE

   Or use the logical device number. For example:

       FILE T;DEV=8

2. Enter a `STORE` command with your options, substituting the date of the last full backup for mm/dd/yy. For example:

       STORE /;*T;DATE>=6/12/90;DIRECTORY;SHOW=OFFLINE;

The `STORE` command copies all system and user files modified since the date of the last full backup, copies the file system directory, and prints a list on files stored to the system printer.

Maintaining a Large Stock of Backup Tapes

You need to maintain a large and easily accessible stock of backup tapes, because you can never be sure ahead of time exactly how many tapes you need for each backup. The number of tapes you need depends upon whether you are performing a full or partial backup and how much data is stored on your system.

Using new tapes ensures the best possible data integrity. You can, however, safely use used or scratch tapes if they are in good condition, and if they contain outdated information. The information on a used tape is outdated if the purge date on the label has passed. To judge whether a used tape is in good condition, check the number written below "CYCLE" on the tape label; it tells you how many times a tape has been used. Tapes wear out and become unreliable after being used many times.

9

Starting and Recovering the System

Before anyone can use your computer system, it must be started. This chapter briefly discusses how to start and restart the system. It also discusses recovering from system failure.

"System startup" refers to the procedure for starting the computer software, the operating system, and other programs that you use. It rarely refers to turning on the power to the computer, disk drives, tape drives, printers, and the console. It does not refer to installing and configuring your system for any new release. (A separate installation guide comes with every new release.) During normal use, computer hardware remains powered on. If the power to the hardware is ever turned off, contact your system manager.

In this chapter, you will find the procedures to perform the following tasks:

■ Starting the system under normal conditions

■ Starting the system after a scheduled shutdown

■ Recovering from a system failure

Starting the System under Normal Conditions

There are five ways to start the operating system:

■ START RECOVERY starts the system and retains scheduled jobs. Use this method after a normal scheduled system shutdown, system hang or failure, or when you need to save scheduled jobs.

■ START NORECOVERY starts the system but does not retain scheduled jobs. Use this method after a change in system configuration or if START RECOVERY fails.

The last three startup options are your system manager's responsibility:

■ UPDATE NOCONFIG replaces the operating system stored on disk with a "clean" copy from tape. The system retains and uses the configuration files stored on disk. Update the computer at the recommendation of your system manager, who may also supervise the process.

■ UPDATE CONFIG replaces the operating system stored on disk with a copy from tape. In this case, the system uses the configuration contained on the tape. Update the computer at the recommendation of your system manager, who may also supervise the process.

■ INSTALL replaces the operating system, subsystem files, and destroys all files on the system volume set. The system volume set files can be restored from tape. An install may require that you reconfigure the system. This is a last resort if all other startup options fail.

To start the system under normal conditions

Use the START RECOVERY option:

■ After a normal scheduled system shutdown.

■ After a system hang, or system failure.

■ Anytime you need to preserve scheduled jobs.

1. Press the [Return] key on the console.

   Look for the Control-B prompt (CM>). If you do not see it, activate control mode by pressing the [CTRL] and [B] keys.

2. Use the two-character reset commands to reset the system. At the CM> prompt, enter:

   TC [Return]

   A soft reset (TC) preserves the current processor state, performs a nondisruptive memory test, and terminates I/O operations. A hard (RS) reset is disruptive. It initiates the processor self-test that resets memory and terminates all I/O operations.

The computer responds with messages similar to the following:

```
Processor Dependent Code (PDC) revision 2.1

Console Path        = 2/4.1.0.0.0.0.0
Primary boot path   = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.
```

If autoboot is enabled, the system attempts to autoboot and issues a message:

```
Autoboot from primary path enabled.

To override, press any key within 10 seconds.
```

3. If you are sure that the autoexecute file contains commands and options that boot the system START RECOVERY, then use it. Otherwise, override it.

   If autoboot has been disabled, the system asks for boot path information:

```
Boot from primary boot path (Y or N)?>
```

4. For the above message, enter:

   [Y] [Return]

   Note that depending on your system you may not need to press [Return] after entering Y or N.

   The system responds:

```
Interact with IPL (Y or N)?>
```

For the previous message, enter:

[Y] [Return]

The system responds:

```
Booting.

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Booted.
MMSAVE Version 9.90
DUMPAREA found, save main memory to disc
ISL loaded



ISL Revision A.00.00   June 6th, 1988

ISL>
```

5. Enter the start command at the ISL> prompt:

START RECOVERY   [Return]

After a minute or so, the system prompts you for the correct date and time:

```
MPE XL launch facility
Initialize_genesis - Version : <<870204.1552>>
MON, JAN 30, 1991,  5:00:00 PM (Y/N)?
```

6. If the date and time are correct, you can either press [Y] [Return] or not take any action. After waiting 10 seconds for input, the system assumes that the date and time are correct and continues booting.

If the time and date are not correct, press [N] [Return].

The system responds:

```
DATE (M/D/Y)?
```

After you have entered the current month, day, and year, the system replies:

```
TIME (H:M:S)?
```

7. After you enter the time, the system asks you to verify that the date and time are correct. Enter:

   [Y] [Return]

   The system seems idle for a couple of minutes before it continues booting.

To verify that the system has been started

To verify that the system has been started:

1. If the [CTRL] [B] prompt (CM>) is on the screen, enter:

   CO [Return]

   Then press [Return] again.

   This takes you out of Control-B mode.

2. If the [CTRL] [A] prompt (=) is on your screen, press [Return] a couple of times.

3. If you do not see one of the following prompts or your application prompt, you need to go to the "Problem Solving" section, chapter 11, of this document:

   ```
   MPE XL:
   :
   ENTER GROUP PASSWORD:
   ENTER ACCOUNT PASSWORD:
   ENTER USER PASSWORD:
   ```

4. If you see a system prompt (MPE XL:), enter:

   HELLO OPERATOR.SYS [Return]

   The computer prompts you for any passwords, then displays logon information. You will see the colon prompt on the left side of the screen.

5. Verify your logon by entering:

SHOWME [Return]

The screen displays:

```
USER: #S18,YOUR.ACCOUNT,PUB       (NOT IN BREAK)
RELEASE: X.40.12   MPE/iX HP31900 B.19.22   USER VERSION: X.40.12
CURRENT: TUE, JAN 22, 1991,  3:00 PM
LOGON:   TUE, JAN 22, 1991,  2:59 PM
CPU SECONDS: 0          CONNECT MINUTES: 1
$STDIN LDEV: 20          $STDLIST LDEV: 20
```

To prepare the system for normal activity

To conclude the startup, you must check, and possibly reset, the following four things:

- The job and session limits.
- The jobfence.
- The outfence.
- The streams device.

To check and reset the job and session limit

1. To check and reset the job and session limit, enter:

SHOWJOB STATUS

2. If you know what the values should be, set them now, using the LIMIT command. Enter:

LIMIT nn,yy

The nn and yy are the job and session limits respectively.

If you are not sure what the limits should be, check with your system manager. If your system manager is not available, use the following formula as a guideline:

SLIMIT = the number of terminals connected to your computer.

JLIMIT = approximately one-fifth of the session limit.

3. To check and reset the spooler outfence, enter:

SHOWOUT STATUS

4. If your system-wide outfence is equal to a number other than 1 or 14, then it has been set for you (by the SYSSTART.PUB.SYS file) during the startup procedure. If it is equal to 1 or 14, check with your system manager for the correct outfence. For example, if the correct outfence is 6, enter:

    OUTFENCE 6

5. To reset an individual outfence, enter:

    OUTFENCE 6;DEV=nn

To set the streams device

To allow users to stream jobs, enter:

    STREAMS 10

Starting the System Without Recovery

The START NORECOVERY method of starting the system does not retain scheduled jobs. Use the START NORECOVERY command:

- When the system configuration has changed.

- If a START RECOVERY failed.

To start the system without recovery

Use the START NORECOVERY option:

1. Press the (Return) key on the console.

   Look for the Control-B prompt (CM>). If you do not see it, activate control mode by pressing the (CTRL) and (B) keys.

2. Use the two-character reset commands to reset the system. Enter:

    RS (Return)

   The computer responds:

> Type Y to confirm your intention to restart system (Y/N):

   Enter:

    (Y) (Return)

The computer responds with messages similar to the following:

```
SPU hardware was successfully reset.

Processor Dependent Code (PDC) revision 2.1

Console Path        = 2/4.1.0.0.0.0.0
Primary boot path   = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.
```

If autoboot is enabled, the system attempts to autoboot and issues a message:

```
Autoboot from primary path enabled.

To override, press any key within 10 seconds.
```

3. If you are sure that the autoexecute file contains commands and options that boot the system START NORECOVERY, then use it. Otherwise, override it.

   If autoboot has been disabled, the system asks for boot path information:

```
Boot from primary boot path (Y or N)?>
```

4. Since you are doing a START NORECOVERY, boot the system from the primary path disk. Press:

   Y Return

   The system responds:

```
Interact with IPL (Y or N)?>
```

5. For the above message, enter:

 Y   Return

The system responds:

```
Booting.

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Booted.
MMSAVE Version 9.90
DUMPAREA found, save main memory to disc
ISL loaded



ISL Revision A.00.00  June 6th, 1988

ISL>
```

6. Enter the start command at the ISL> prompt:

   START NORECOVERY   Return

   After a minute or so, the system prompts you for the correct date
   and time:

```
MPE XL launch facility
Initialize_genesis - Version : <<870204.1552>>
MON, JAN 30, 1990,  5:00:00 PM (Y/N)?
```

7. If the date and time are correct, you can either press Y   Return
   or not take any action. After waiting 10 seconds for input, the
   system assumes that the date and time are correct and continues
   booting.

8. If the time and date are not correct, press:

    N   Return

The system responds:

```
DATE (M/D/Y)?
```

After you have entered the current month, day, and year, the system replies:

```
TIME (H:M:S)?
```

9. After you enter the time, the system asks you to verify that the date and time are correct. Press:

   Y   Return

   The system seems idle for a couple of minutes before it continues booting.

To prepare the system for normal activity

If your operator session was not automatically started, you have to log on to the console.

■ At the system prompt (`MPE XL`), enter:

    HELLO OPERATOR.SYS;HIPRI [Return]

Adding `HIPRI` allows you to start a session regardless of the value of the session limits or jobfence. If you do not see one of the following prompts or your application prompt, you need to reset and start the computer:

```
MPE XL:
:
ENTER GROUP PASSWORD:
ENTER ACCOUNT PASSWORD:
ENTER USER PASSWORD:
```

The computer prompts you for any passwords, then displays logon information. You will see the colon prompt on the left side of the screen.

■ Verify your logon by entering:

    SHOWME [Return]

The screen displays:

```
USER: #S18,YOUR.ACCOUNT,PUB       (NOT IN BREAK)
RELEASE: X.40.12   MPE/iX  HP31900 B.19.22   USER VERSION: X.40.12
CURRENT: TUE, JAN 22, 1991,  3:00 PM
LOGON:   TUE, JAN 22, 1991,  2:59 PM
CPU SECONDS: 0         CONNECT MINUTES: 1
$STDIN LDEV: 20         $STDLIST LDEV: 20
```

To conclude the startup, you must check, and possibly reset, the following four things:

■ The job and session limits.

■ The jobfence.

■ The outfence.

■ The streams device.

To check and reset the job and session limit

1. To check and reset the job and session limits, enter:

   <u>SHOWJOB STATUS</u>

2. If you know what the values should be, set them now, using the LIMIT command. Enter:

   <u>LIMIT nn,yy</u>

   The nn and yy are the job and session limits respectively.

   If you are not sure what the limits should be, check with your system manager. If your system manager is not available, use the following formula as a guideline:

   SLIMIT = the number of terminals connected to your computer.

   JLIMIT = approximately one-fifth of the session limit.

3. To check and reset the spooler outfence,enter:

   <u>SHOWOUT STATUS</u>

4. If your system-wide outfence is equal to a number other than 1 or 14, then it has been set for you (by the SYSSTART.PUB.SYS file) during the startup procedure. If it is equal to 1 or 14, check with your system manager for the correct outfence. Enter:

   <u>OUTFENCE 6</u>

5. To reset an individual outfence, enter:

   <u>OUTFENCE 6;DEV=nn</u>

To set the streams device

To allow users to stream jobs, enter:

<u>STREAMS 10</u>

10

Shutting Down the System

A *system shutdown* rarely implies turning off the power to the computer hardware. Instead, system shutdown means stopping the computer's operating system, which is the software that controls computer activity. Stopping all, or almost all, system activity makes the computer inaccessible to users. From their perspective, it is immaterial whether you also turn off the SPU, disk drives, tape drives, and console.

Many computers are used 24 hours per day. As a result, you may perform all but the last step in a system shutdown to force users to save the most current versions of their files, then perform the procedure known as a *system backup*. (System backup is explained in chapter 8.) You also shut down the computer to change its *configuration*, or how all the pieces fit, and work, together. To do this, you will probably work with your system manager.

In this chapter, you will find the procedures to perform the following tasks:

■ Scheduling shutdowns

■ Giving computer users advance notice

■ Shutting down the system

Scheduling Shutdowns

The computer is a tool that people rely on to do their jobs. If you take it away from them without warning, you are likely to have irritated people. To provide the best service to your computer users:

- Plan a regular shutdown schedule that is convenient for the majority of computer users.

- Let everyone know what the schedule is ahead of time.

Scheduled shutdowns frequently coincide with system backups because users must stop using the computer. As you read this chapter, notice that the steps you take to shut down the system are nearly identical to those needed to prepare for a backup.

To include shutdown information in the WELCOME message

You should include shutdown information in the daily WELCOME message. This way, users know what to expect as soon as they log on to the computer, and can plan their work accordingly.

Below is an example of an informative WELCOME message. It is clear, concise, and lets people know that they can call you if the shutdown schedule presents a problem.

```
****************************************
*                                      *
*     Welcome!  The system will        *
*     be shut down at 5 PM today,      *
*     12/22/90.                        *
*     If you have any questions,       *
*     call Extension 1234.             *
*                                      *
****************************************
```

Create the WELCOME message for your computer and change it as needed. To learn how, read "Communicating with the Users," in chapter 5.

Shutting Down the System

Shutting down the system's activity consists of several steps, including the following:

- Notifying everyone a week in advance of a planned shutdown.

- Warning everyone a few minutes before the shutdown.

- Preventing anyone from starting a new job or session, or printing new reports.

- Suspending or aborting any jobs and aborting any remaining sessions.

- Entering the `SHUTDOWN` command.

The following section briefly describes the shutdown procedure.

To shut down the system

To shut down the computer system:

1. Send a `TELL` message to your users 15 minutes before the shutdown. Enter:

   ```
   TELL @S;SHUTDOWN IN 15 MINUTES.  PLEASE LOG OFF.
   ```

   This message reaches all active terminals, except those in quiet mode. One way to inform all users is to repeat the `TELL` message a few minutes later with an extra note. Enter:

   ```
   TELL @S;SHUTDOWN IN 10 MINUTES.
   PLEASE TELL YOUR QUIET NEIGHBORS.
   ```

   If you cannot conveniently contact the quiet users, you can send them a `WARN` message. For example:

   ```
   WARN #S123;SHUTDOWN IN 10 MINUTES
   ```

2. Prevent anyone from starting a new job, session, or printing new reports.

   In addition to asking users to quit using the computer, you also must make sure that nobody starts any new work. About 10 minutes before the shutdown, enter:

   ```
   LIMIT 0,0  Return
   ```

   ```
   JOBFENCE 14  Return
   ```

The command `LIMIT 0,0` limits the number of concurrently running jobs and sessions. The two parameters, in this case, `0,0` define the allowed number of jobs and sessions, respectively.

The command `JOBFENCE 14` defines the minimum input priority a job or session must have to execute. The parameter `14` raises the jobfence to the highest level.

3. Close any open communication lines.

   Close any of the system's open communication lines. Enter both of the following to deactivate the NS3000/XL product:

   `NSCONTROL STOP`
   `NETCONTROL STOP`

   Consult the manuals of any other communications products for instructions on deactivating them.

4. Shut down the system.

   To shut down the system, enter:

   [CTRL] [A]

   At the `=` prompt, enter:

   `SHUTDOWN`

   The console responds by listing shutdown messages similar to the following:

```
Shutdown of operating system begins.  (Shut 1)
Shutdown of user processes begins.  (Shut 2)
Shutdown of jobs & sessions begins.  (Shut 3)
Spoolers notified of a shutdown.  (Shut 16)
Shutdown of system processes begins.  (Shut 4)
Shutdown of system managers begins.  (Shut 5)
Shutdown of operating system complete.  (Shut 6)
```

Note that depending on your system the `Shutdown of operating system complete` message may take a while to appear.

11

Problem Solving

This checklist is provided to assist you with troubleshooting
terminals and your system console. If you are having problems, work
down the checklist until the problem is solved. Perform the checklist
steps in order. The checklist steps increase in severity and amount of
disruption to the system.

**If nothing happens
when you type on the
terminal**

⎕ Press [Return] several times.

⎕ Check that the terminal is plugged in.

⎕ Check that the terminal is turned on.

⎕ Check that the terminal is connected to the system.

    Make sure that the cable is connected firmly at the back of the
terminal. Trace the cabling back to its connection in the serial
port. Make sure the cable is connected firmly in the serial port
socket.

⎕ Check that the terminal is not in control-s mode.

    To check this, type control-q.

⎕ If you have user softkeys showing on your terminal screen, press
the [System] key on your keyboard. Then press [F4] to see the
[Modes] label.

⎕ Check that [BLOCK] mode has no asterisk (*) in the label.

⎕ Check that [REMOTE] mode has an asterisk in the label.

⎕ Check to see if the BAUD rate is set to the correct speed.

■ If not, press [F4] to toggle to remote mode. An asterisk should
appear in the fourth window of the display at the bottom of the
screen.

■ Press [Return] a few times to see if the cursor prompt appears.

■ Try a soft reset: [Shift] [Reset].

○ Interrupt the process that may be functioning.

A terminal does not respond if the session is currently working on something. The user can check to see if the terminal is actually functioning by interrupting its processing.

■ Press the (Break) or (Reset/Break) key on the terminal.

■ If a colon prompt is displayed, you may enter `Abort` (Return) to abort the process. At this point, you have solved your terminal problems.

○ Abort the input and output for the terminal.

1. Find the LDEV number for the terminal.

   a. Ask the user what it is.

   b. Check the LDEV number on the terminal screen.

   c. Find the LDEV number from the console display of active sessions.

      i. Enter `SHOWJOB JOB=@S` (Return).

      ii. Find the identity of the user on the display.

      iii. Find the LDEV number in the `JIN` and `JLIST` columns.

2. Enter `ABORTIO` *nn* (Return) at the console.

3. Repeat this command until an I/O abort message is displayed on the console.

4. Press (Return) at the terminal to get the colon prompt.

○ Abort the session.

1. Enter `SHOWJOB JOB=@S` (Return) at the console.

2. Find the session number associated with the user's identity.

3. Enter `ABORTJOB #S`*nnn* using the user's session number.

4. After the session abort message appears on the user's terminal and the logoff message has been displayed on the console, have the user press the (Return) key several times.

5. If the colon prompt does not appear on the terminal, enter the `ABORTJOB` command again.

○ Check to see if other terminals are hung.

Several hung terminals usually means system problems. Verify the operation of the console and other devices.

If nothing happens when you type at the console

A hung console is more serious than a hung terminal. Without the console, you cannot monitor or control the system.

⃝ Check to see if the console responds with any of the routines suggested for a hung terminal.

⃝ Check to see if the BAUD rate is set to the correct speed.

⃝ Check to see if there are any pending console requests.

    ■ Hold down the (CTRL) key and press (A).

    ■ If the = prompt appears, enter RECALL (Return).

    ■ If there are pending requests, respond to them one at a time.

⃝ Press the (Break) key 2 or 3 times. If remote console is enabled, somebody else may control the console. Pressing (Break) several times returns contorl to the operator.

⃝ Have someone send you a message.

    ■ Enter TELLOP Let's try this! (Return) from a working terminal.

    ■ When the message appears on the console, press (Return) to get the colon prompt.

⃝ If the = prompt does not appear, abort input and output to the console from another terminal:

    ■ Enter ABORTIO 20 (Return). You must have SM capability to use the above command, unless your system manager has allowed you the command.

    ■ Repeat this command a few times until you see the message that no I/O remains.

    ■ Enter (Return) several times.

○ Switch the console to a working terminal.

You must have SM capability to switch the console unless your system manager has allowed you the `ALLOW` command.

1. Log on to another working terminal as `OPERATOR.SYS`.

2. At the colon prompt, enter `CONSOLE` (Return) to determine the LDEV number of the console.

3. Enter `SHOWME` (Return) to determine the LDEV number of the terminal that you are using.

4. Enter `CONSOLE` *nn* (Return) to switch the console to the terminal that you are using.

5. Verify the switch by entering the `CONSOLE` command again to display the console's LDEV number as your terminal.

6. Enter `SHOWJOB JOB=OPERATOR.SYS` (Return) to determine the session number logged on to LDEV 20, the original console.

7. At the : prompt, enter `ABORTJOB JOB=#S`*nn* (Return) to abort your original session at the console, the one you found in step 6.

8. If a logoff message displays on the new terminal, go back to the original console and press (Return) several times.

9. Log on to the original terminal by entering `HELLO OPERATOR.SYS;HIPRI` (Return).

10. Move the console back by entering `CONSOLE 20` (Return) at the original console.

11. At this point, you should call your system manager.

○ Try restarting your session with everyone off the system.

1. Contact all users currently active on the system, and ask them to save their work and log off.

2. If a `=` prompt is displayed, enter `LOGOFF` (Return) to end all sessions, including yours, and prevent anyone from logging back on.

3. Press the (Return) key a few times.

4. Hold down (CTRL) and press (A).

5. If you get the `MPE XL:` prompt, enter `LOGON` (Return).

6. Press the (Return) key a few times.

7. At the `MPE XL` prompt, enter `HELLO OPERATOR.SYS;HIPRI` (Return).

8. If you log on to the system successfully, ask users to try logging back on.

○ Shut down the system.

- Hold down the (CTRL) key and press (A).

- At the = prompt, enter SHUTDOWN (Return).

- After several abort messages and a shutdown message are displayed, perform the recovery procedure.

If (CTRL) (A) does not work, try (CTRL) (B). If (CTRL) (B) does not work, reset the computer manually, by using either the button or key on the CPU.

If you need to perform an emergency shutdown

○ If the console is still working, enter WARN @S;SYSTEM GOING DOWN. PLEASE LOG OFF. (Return), or tell users in person to save their files and log off now.

○ Shut down the system.

- Hold down (CTRL) and press (A).

- At the = prompt, enter SHUTDOWN (Return). If the = prompt is not displayed, try (CRTL) (B). If the CM> prompt is not displayed, manually reset the system at the CPU.

○ Follow the instructions in chapter 9, "Recovering from a System Failure" for recovery from an emergency shutdown or system failure.

If you think there is a problem with tapes

If a problem occurs, the first step is to try to establish whether the problems lie with the tape, the tape drive, or the host computer.

○ Is there a problem with the tape?

1. Clean the tape heads (if you have a DDS tape drive, use the cleaning cassette).

2. Try the operation again.

3. If the problem still occurs, try using a different tape.

4. If the problem persists after changing tapes, the tape is probably *not* the cause.

○ Is there a problem with the tape drive?

■ Has the tape drive been moved recently?

■ Has the environment changed? Is it unusually hot, cold, damp, or dry?

■ Has there been dust or dirt near the tape drive?

■ Have reasonable precautions against static been taken?

If the answer is "yes" to any of the above questions, do the following:

1. Clean the tape heads and try the operation again.

2. If the problem persists, check the environmental conditions against the drives specified limits and try to correct the conditions if they are outside the limits. Perhaps move the drive to a more suitable site.

○ Has a new operating system been installed in the host computer?

■ The problem could be with the computer. Report the problem to your system's manager.

If there are problems printing

If you or your users are having problems with getting printouts, consider the following.

○ Is the printer ready?

■ Be sure that the printer is powered up and online.

○ Is the printer out of paper, or is there a paper jam?

■ Load more paper, or clear the jam.

○ Is the printer outfence too high?

■ The outfence should be lowered with the `OUTFENCE` command, or the output priority for files waiting to be printed (spool files) should be undeferred or raised (above the printer outfence) with the `SPOOLER` command.

○ Has the print file been deferred, or is its output priority lower than the outfence?

- Use the `SHOWOUT` command to check the outfence. Use the `LISTSPF` command to check the output priority of your print file and to see if it has been deferred. Use the SPOOLF command to undefer your print file or raise its output priority.

☐ Is the printer waiting for a special form to be loaded?

- Use the `RECALL` command to see if a reply request is pending for the printer. Load special forms, if necessary, and reply to the request.

☐ Is the printer waiting for forms alignment verification?

- If special forms have been loaded, the printer may be waiting for verification that the forms have been properly aligned. Use the `RECALL` command and check the printer.

☐ Is the printer waiting for regular paper (not a special form) to be loaded?

- If a special forms request has just been processed, your printer may be waiting for regular paper to be reloaded. Use the `RECALL` command, as above, to check.

☐ Has the printer been downed from the console?

- Up the printer with the `UP` command.

If there is a non-recoverable power failure on systems using UPS devices

If AC power does not return before the UPS devices on your system are exhausted, you must turn power to the UPS hardware off and then on again before you begin system recovery procedures.

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