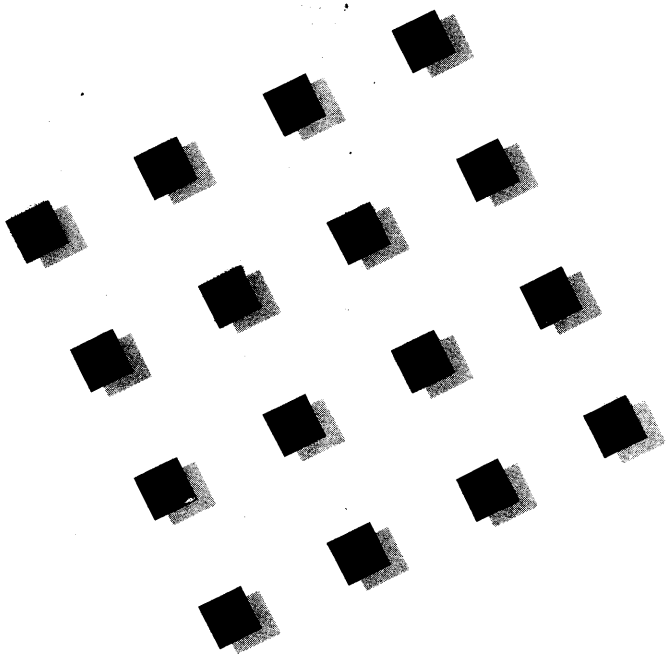
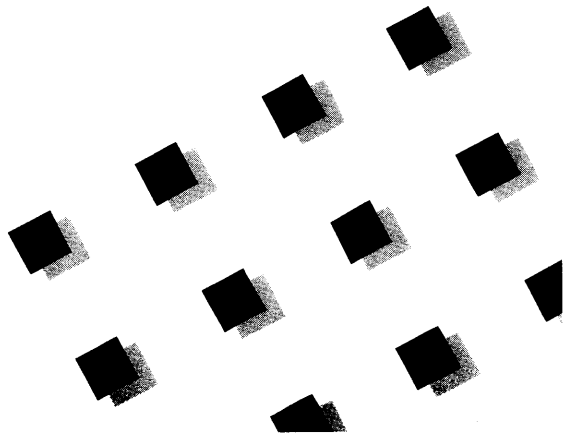


HP 3000 Guide for the New System Operator



HEWLETT PACKARD

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Introduction

Your job, the System Operator, is to keep the computer system running on a daily basis. To do so, you'll perform specific tasks, including:

- Monitoring the Console
- Managing sessions
- Managing jobs
- Managing your printer
- Storing files
- Restoring files
- System backup
- System startup
- System shutdown
- Recovering from system hangs and failures

You may be unfamiliar with most, if not all, of these tasks right now. Don't worry—each one is explained in a separate chapter that begins by telling what you'll learn, uses plenty of examples to give you practical experience, and concludes with a quiz to check your understanding. Once you're comfortable with the tasks, you can use the "Quick Summary" at the back of each chapter to remind you of specific steps. Read the Guide at your own pace; mastering the basics will make other computer information easier to digest.

When there's a problem, computer users turn to the System Operator for help and advice. Fortunately, most Operators are part of the team of people who manage the computer system. Find out who can answer your questions (your System Manager, other Operators) and record their names and numbers in the space below. They can quickly tell you of the specific features of your computer system that affect how you operate it.

System Manager		Phone Number	
Other Support		Phone Number	

What is a Computer System?

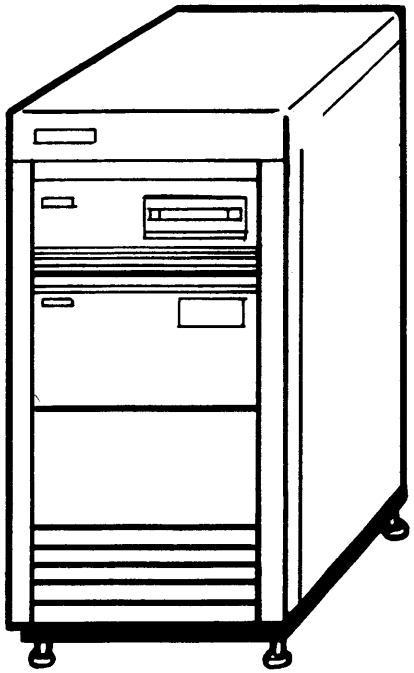
A phrase that you'll see frequently in this Guide is "computer system". Your computer system will probably consist of the following things:

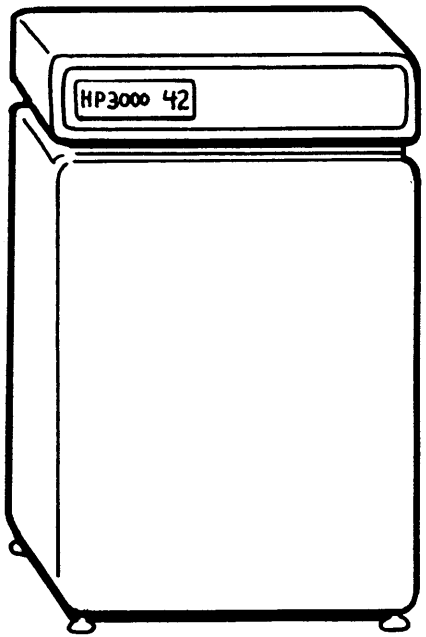
- The System Processing Unit
- The Operating System (MPE)
- Disc Drive(s)
- Tape Drive(s)
- System Printer(s)
- Computer Terminals
- The Console

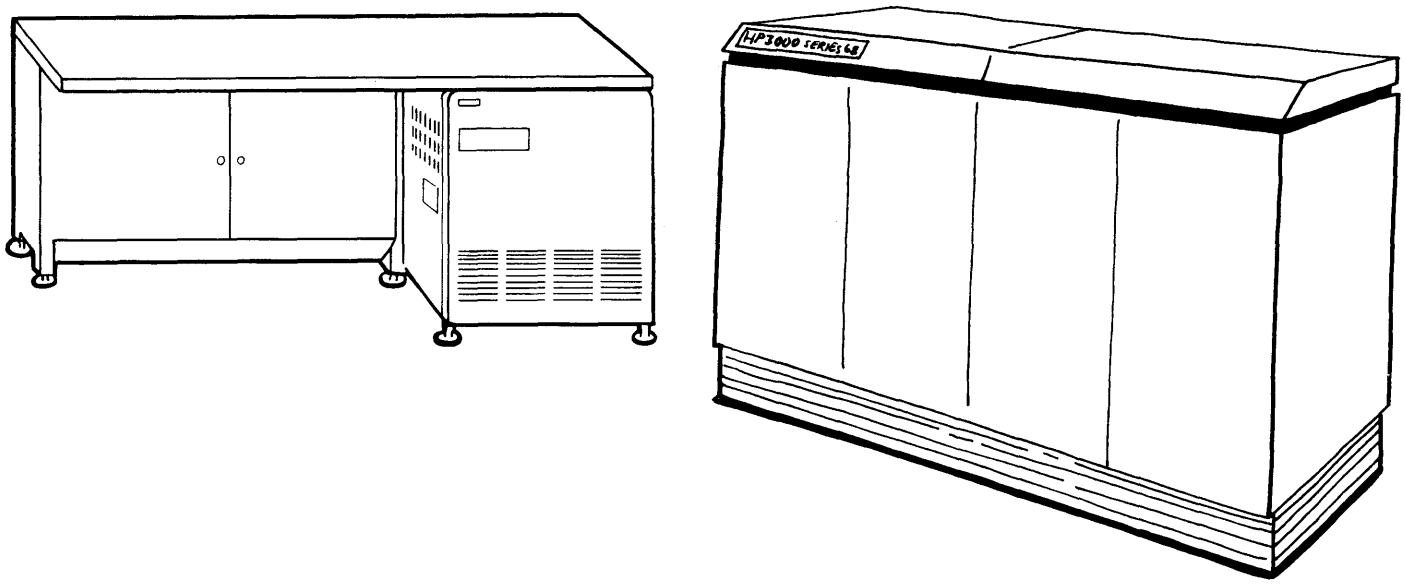
The System Processing Unit, or SPU

Strictly speaking, this is the computer. It is the core of the system because it carries out your instructions and processes information. The other parts of the system, such as printers and terminals, are peripheral to the SPU; that's why they're called "peripheral devices".

The SPU is "hardware", a part of the system you can see. Yours will be labelled with a model number such as "Series 37" and will look like one of the pictures below:







The Operating System

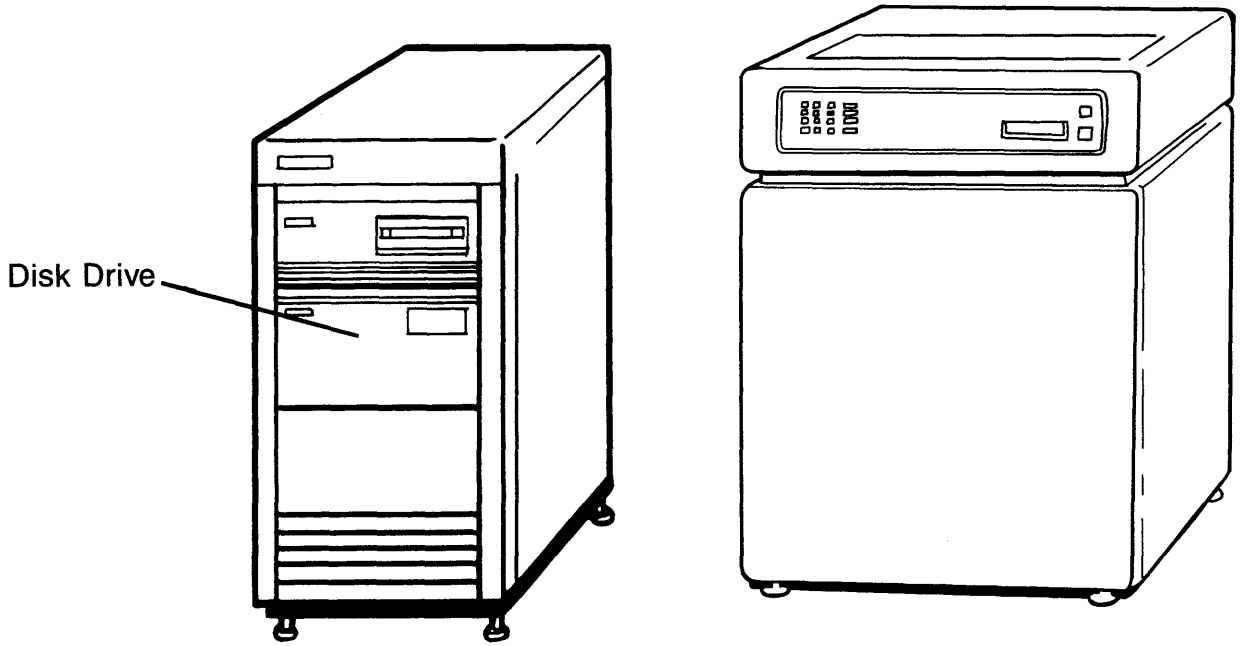
The HP 3000 computer uses the Multi-Programming Executive (MPE) operating system to understand and follow your commands. When you tell the computer to do something, you're actually "talking" to MPE.

MPE is a collection of instructions that give the computer hardware some intelligence. It's "software", the part of the system you can't see. But you'll know immediately if it isn't working. Without the operating system, your computer is an unweildy piece of furniture, and not a useful tool.

The Disc Drive

Your computer stores information on a disc in much the same way that songs are recorded on a record. To play music, you need a turntable. To store and retrieve disc files, you need a disc drive.

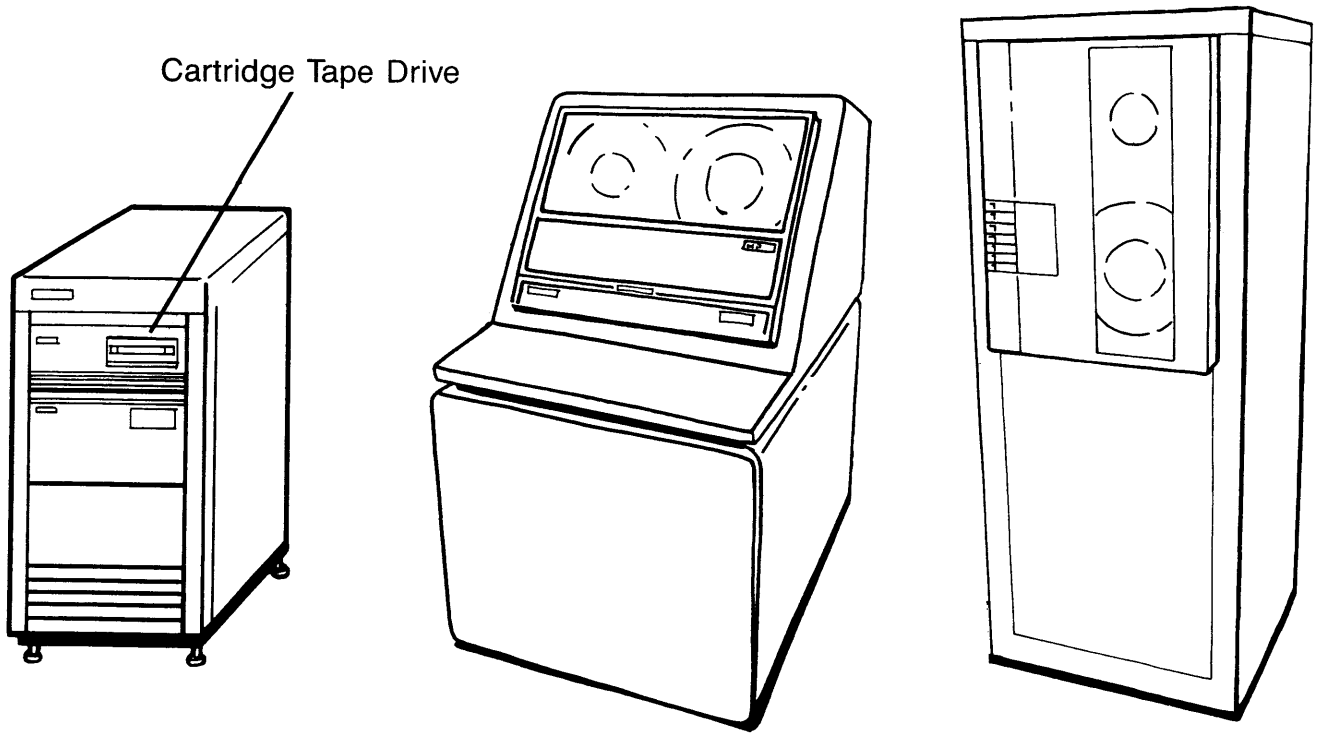
Discs are encased within the drive to form a single unit. The disc drive may be small, like the one used with the Series 37 computer. Or, the disc drive may look a little like a portable dishwasher. Larger systems use more than one of these; the number depends upon how much information the computer stores.



The Tape Drive

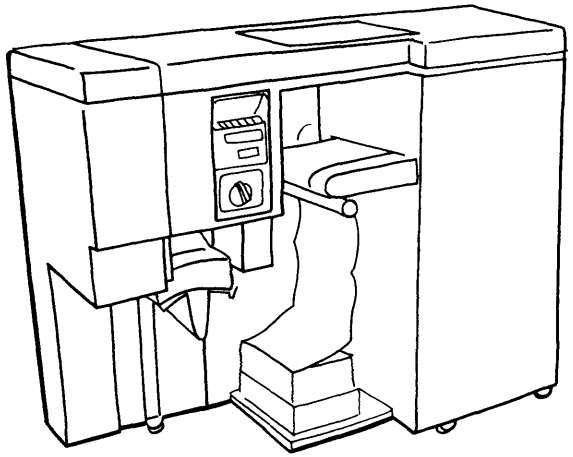
When you work with computer information, you primarily work with the files stored on disc. Computer information can also be stored on magnetic tape. Usually, though, you'll use tapes to duplicate your disc files as a safety precaution, or as a convenient way to transfer files to another computer.

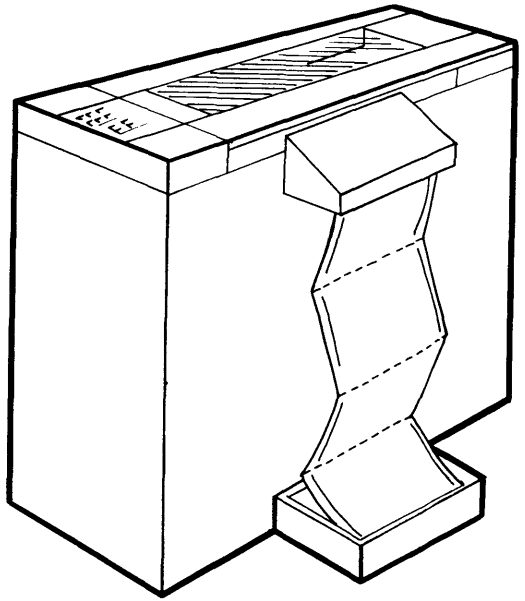
The tape drive is the machine that transfers information between a tape and the computer. There are two basic kinds of tape drives: Cartridge tape drives, which use only cartridge tapes, and reel-to-reel tape drives, which use reel tapes.



System Printers

Printers come in all shapes and sizes. System printers, which everyone shares, usually operate at high speed to keep up with the demand for printed reports. Your computer system will have at least one shared printer.





Computer Terminals

A computer terminal consists of a display screen and keyboard. Everyone using the computer uses one.

The Console is the terminal you'll use to monitor and control the entire computer system. It's usually located near the SPU.

Introduction To Chapter One

This chapter introduces the Console, explains how to use it and how it is different from other terminals.

One terminal connected to your computer is the System Console. It responds to a special set of commands that other terminals can't interpret. By using these commands, you can get a comprehensive picture of all system activity.

The Console is also your computer's message center. It supplies you with two types of information:

- Messages from the computer. These tell you who is using it, if there are any problems, and whether the tape drive or printer need your attention.
- Messages from users. Frequently, users will ask to use the tape drive, or they may need you to change the paper forms on the printer. Occasionally, they'll send general messages or ask a question, to which you can reply by typing the answer at the Console.

Both types of messages will appear on the Console at any time, but they won't affect what you're doing. This chapter, and some experience with your Console, will familiarize you with the more common messages.

You'll also use the special features of the Console to manage the computer on a daily, and even an hourly, basis. Each of the tasks you're expected to perform—such as controlling who uses the computer, the printer, and keeping everyone informed of important events—is briefly introduced in this chapter so that you'll know just how important you, and the Console, are.

1 Monitoring the Console

Your First Tour Of The Computer System

The special computer terminal that's used as your system Console is the focal point for all computer activity. For this reason, an introduction to the Console should encompass a brief tour of the entire system.

Most Operators can "tour" the computer system by standing in one place. The equipment that's shared among all users—the System Processing Unit, the printer(s), tape drive(s), and disc drive(s)—is usually within reach of the Console so that you can easily keep an eye on things.

Who Is Your Guide?

You'll use this chapter to acquaint yourself with the Console and the computer. How you use it depends upon who, if anyone, is available to answer your questions. To make sure that you know which questions to ask, consult the list on the next page, "What You Should Know By The End Of This Chapter".

- If you learn best by trying everything on your own, or you're a staff of one and don't have any choice, be your own guide. Begin by reading the questions on the next page, then read through the chapter carefully to answer them.
- If you want to explore some things on your own, but get help with others, use the questions on the next page as a checklist. Just make sure you've answered them all by the end of the chapter.
- If someone is available to take you on a tour through your computer system, approach them with this list in hand. This way, you can get the basic information you need in a few minutes.

What You Should Know By The End Of This Chapter

Answer, or have someone help you answer, the questions below. The terminology is explained throughout the chapter, so you needn't be concerned if you don't understand it all now.

1. Which version of the MPE operating system is your computer using?

   _____

2. Where is the Console? What is the Console's logical device number?

   _____

3. Do I need any passwords to log onto the computer as 'OPERATOR.SYS"? (Don't record them.)

4. What capabilities is OPERATOR.SYS assigned?

   _____

   _____

5. What commands is OPERATOR.SYS allowed?

   _____

6. How can I get a list of all the equipment connected to the computer, and where should it be posted?

   _____

7. Where is the printer? What is its device class name and logical device number?

   _____

8. Where is the tape drive? What is its device class name and logical device number?

   _____

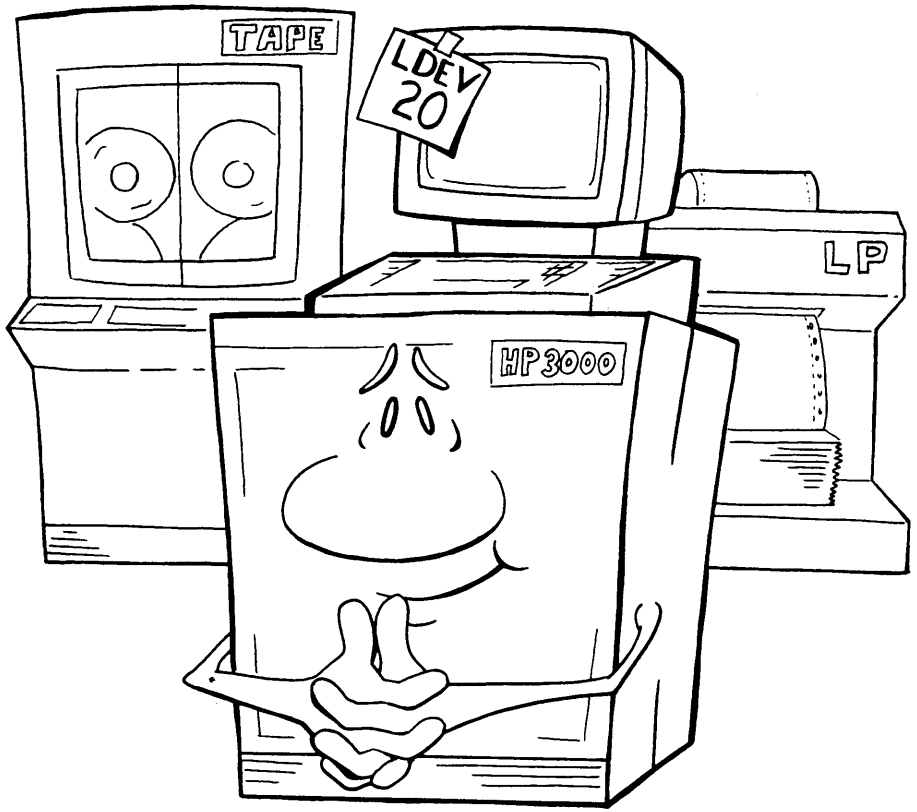
Finding the Console

The Console is one of the terminals connected to your computer. If you already know which one it is, go to "Start Using Your System Console" on page 1-10. If you're comfortable exploring on your own, use the clues listed next to find it. If you don't know where the Console is, and you'd like specific directions to find it, read the clues, then follow Steps One through Five.

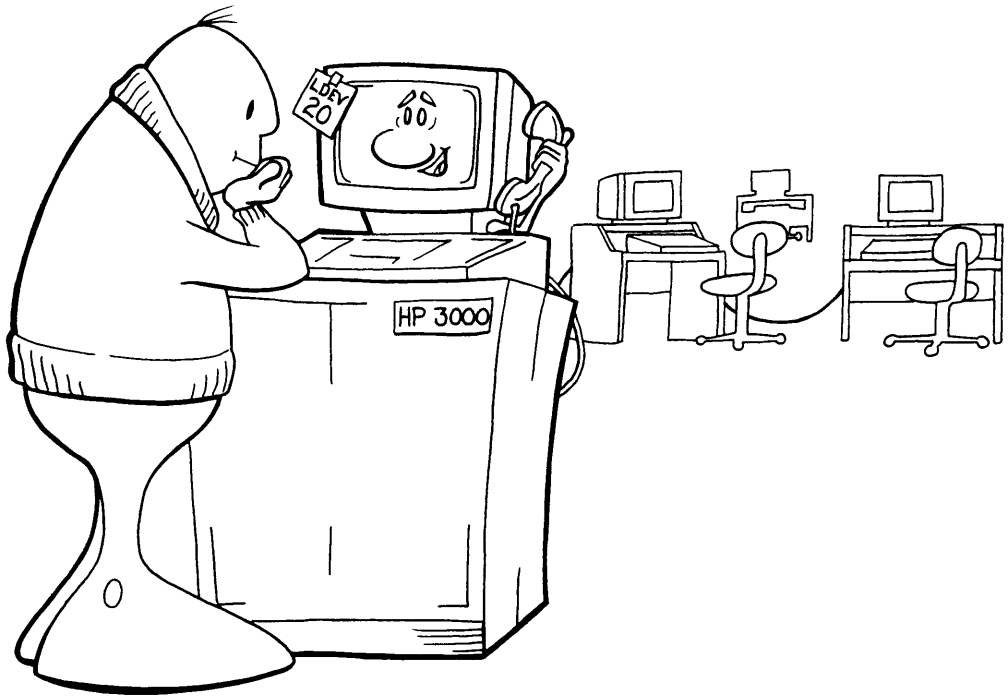
Some Clues To Simplify The Search

Computer systems come in all shapes and sizes, but the following things are almost always true:

- The Console, the computer, and peripheral equipment (tape drives, printers, etc.) are grouped together.



- If the computer is on, the Console is on; other terminals can be turned off when they're not needed.
- Messages from the computer system and from users are continually sent to the Console whether or not anyone is using it.



- The Console is logical device 20. Use the SHOWME command to find LDEV 20, and you've found the Console.

Step One: Log Onto The Computer

If you have already started a session on your terminal (by typing HELLO and your computer identity), go on to Step Two. If not, and if your terminal is on, press Return. If it isn't, turn it on, wait a minute or so, then press Return.

When the colon prompt appears, type: SHOWME Return

If the computer tells you it "EXPECTED HELLO...", use your computer identity or USER.ACCOUNT, the identity introduced in The Guide For The New User, to log onto the computer:

Type: HELLO USER.ACCOUNT Return
↑ *(or use your own identity)*

IMPORTANT

This book is intended for beginning Operators. If you've never used the computer, start by reading The Guide For The New User (Part Number 32033-90009).

The computer will respond with some information, and then print the colon prompt on the left side of the screen again. You have just "logged on" to the computer.

IMPORTANT

The colon prompt indicates that you are talking directly to the operating system, MPE. When you see it, the computer is ready for your commands.

Step Two: A Little Help From SHOWME

At the colon prompt, type: **SHOWME** Return

```
USER: #S23,USER.ACCOUNT,PUB   (NOT IN BREAK)
MPE VERSION: HP32033G.01.00  (BASE G.01.00).
CURRENT: MON, JAN 28, 1985, 3:49 PM
LOGON:   MON, JAN 28, 1985, 8:14 AM
CPU SECONDS: 37      CONNECT MINUTES: 452
$STDIN LDEV: 24      $STDLIST LDEV: 24
               ↑                    ↑
       (the LDEV number)    (the LDEV number)
```

The names, numbers, and dates on your screen will be different because this information is the computer's record of your computer session. You may also see other information below this description. For now, ignore it, and just look for the LDEV number. It uniquely identifies your terminal.

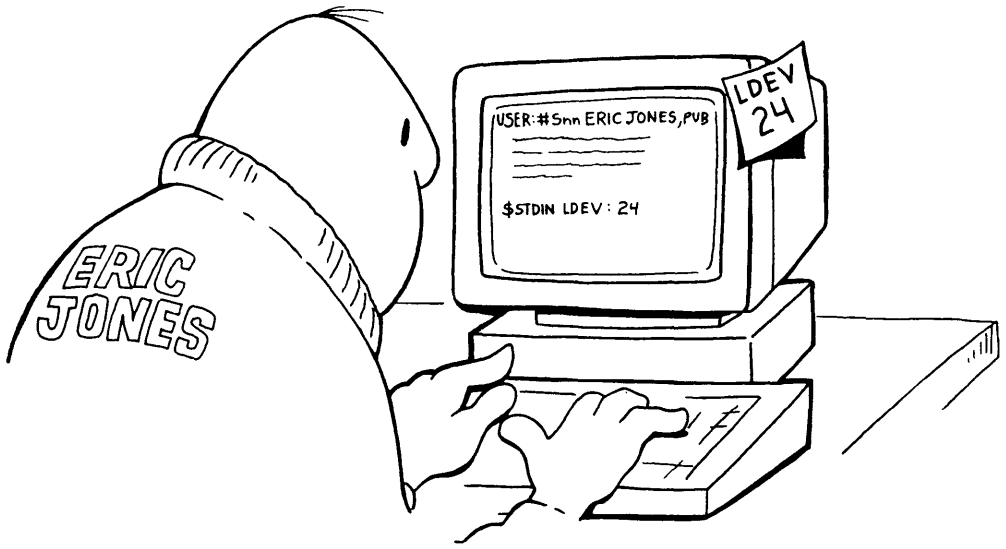
If your neighbors are using their terminals, ask them to type the SHOWME command. Compare the information on their screen to yours.

Step Three: Label Your Terminal

At your terminal, type: SHOWME Return

Write the LDEV number that appears on your screen on a small piece of paper or label. Attach it to the terminal so that the number can be easily seen. This is the LDEV number of your terminal; it won't change.

Suggest to your neighbors that they label theirs; this will be handy later.



Step Four: Find The Console's LDEV Number

Type: SHOWDEV CONSOLE Return

```
LDEV   AVAIL     OWNERSHIP     VOLID          DEN     ASSOCIATION

 20    AVAIL
  ↑ (the LDEV number of the Console)
```

This tells you that the Console is the terminal assigned logical device number 20. To find out if it's there, or if it's been temporarily moved to another terminal,

type: CONSOLE Return

You'll see a message like the one below, only "nn" will be replaced by the LDEV number of the terminal that's being used as the Console right now.

```
CONSOLE IS CURRENTLY ASSIGNED TO LDEV nn.
                    (a number; check your screen) ↑
```

IMPORTANT

The letter "n" is used in other examples in this Guide to represent a number. It's a clue for you to check or use the actual number on your screen.

If the same LDEV number appears in both messages, then the Console hasn't been moved. ("Moving The Console" is explained at the end of this chapter.) If they don't match, you'll use the LDEV number in the second message to look for the Console in Step Five, next.

Step Five: Use SHOWME To Find The Console

Starting with the terminal closest to the computer,

type: **CONSOLE** Return

and: **SHOWME** Return

Try these two commands at other terminals until you find the one that reports matching LDEV numbers. (In the example below, the Console is LDEV 20. It may be another number on your computer.)

```
:CONSOLE (what you typed)

CONSOLE IS CURRENTLY ASSIGNED TO LDEV 20.


:SHOWME  (what you typed)
USER: #S669 OPERATOR.SYS,OPERATOR    (NOT IN BREAK)
MPE VERSION: HP32033G.01.00  (BASE G.01.00).
CURRENT: MON, JAN 26, 1985, 3:50 PM
LOGON:   MON, JAN 26, 1985, 8:00 AM
CPU SECONDS: 37      CONNECT MINUTES: 467
$STDIN LDEV: 20      $STDLIST LDEV: 20
```

(the Console's LDEV number)

IMPORTANT

Don't expect the examples in this Guide to exactly match the information on your Console. The information you get should appear in the same format, but the names, numbers, and dates will be different.

Start Using Your System Console

Once you've found the Console, type: SHOWME Return

If the computer tells you that it "EXPECTED HELLO...", then no one is logged onto the Console. Skip to the next section, "Log Onto The Console".

Otherwise, you'll see a description of who is using the Console:

```
USER: #S669 OPERATOR.SYS,OPERATOR     (NOT IN BREAK)
       ↑      ↑       ↑       ↑
    session   user   account  group
    number    name
```

The user will be OPERATOR.SYS if your computer automatically starts the Operator's session on the Console. (Your session number, which the computer arbitrarily assigns when the session is started, won't match the one above.) If someone else is logged onto the Console, follow the directions in "Log Onto The Console", next, to start the Operator's session.

Log Onto The Console

Type: HELLO OPERATOR.SYS Return

The computer will display some information, then one of two things will happen:

- The colon prompt will be printed on the left side of the screen. This means you've successfully started a session as OPERATOR.SYS. If so, skip to "Console Information: The Whole Picture", on page 1-13.
- You'll be asked to "enter", or type, one or more passwords. Once you do so, the session begins.

IMPORTANT

When you begin using the Console, you can treat it the same way you do a standard terminal, with one exception:

DON'T TURN THE CONSOLE OFF!

What About Passwords?

Passwords are used to preserve system security. They can be assigned to accounts, groups, and users, and should only be known to those who need them. If the SYS account is password-protected, the following question will appear soon after you type HELLO:

```
:HELLO OPERATOR.SYS (what you typed)

ENTER ACCOUNT PASSWORD:_
```

If you don't know the password, read "Where To Get Password Information" on the next page. If you do, carefully type it in. (Nothing appears on the screen as you type.) If the colon prompt, and nothing else, is printed on the Console, skip to "Console Information: The Whole Picture". If you mistype the password, you're given two more tries to type it correctly. If you mistype the password on the third try, you'll have to start over with the HELLO command.

```
:HELLO OPERATOR.SYS (what you typed)

ENTER ACCOUNT PASSWORD:_ (your first try)

ENTER ACCOUNT PASSWORD:_

ENTER ACCOUNT PASSWORD:_
```

Unless you typed the password correctly on the first try, you undoubtedly noticed a message like the one below:

```
:17/#S420/77/INVALID PASS FOR "OPERATOR.SYS, OPERATOR" ON
              LDEV "20"
```

An "INVALID PASS" message is sent to the Console anytime anyone types an incorrect password. It's an example of the type of messages that continually appear on the Console. Their purpose is to keep you informed of system activity. For more information, refer to "Messages From The Computer System", on page 1-22.

Once you type the correct account password, you may also be prompted to type in a group password and a user password to log onto the computer. You're given three tries to type these correctly, too.

Where To Get Password Information

Account passwords are assigned by your System Manager. To find out what they are, call your Manager or ask another experienced Operator. Also find out how frequently the passwords are changed, and how you can stay informed.

Once you know your passwords, log onto the Console, and type the passwords as you're prompted for them. You'll know you have succeeded when the colon prompt is printed on the left side of your screen.

Console Information: The Whole Picture

Type: **CONSOLE** Return

and: **SHOWME** Return

```
:CONSOLE  (what you typed)
CONSOLE IS CURRENTLY ASSIGNED TO LDEV 20.

:SHOWME   (what you typed)
USER: #S669 OPERATOR.SYS,OPERATOR      .NOT IN BREAK)
MPE VERSION: HP32033G.01.00  (BASE G.01.00).
CURRENT: MON, JAN 26, 1985, 3:50 PM
LOGON:   MON, JAN 26, 1985, 8:00 AM
CPU SECONDS: 37      CONNECT MINUTES: 467
$STDIN LDEV: 20      $STDLIST LDEV: 20
```

(these numbers must match)

If you, OPERATOR.SYS, aren't logged onto the Console, return to "Start Using Your System Console", on page 1-10.

What Version Of The MPE Operating System Is The Computer Using?

Type: SHOWME Return

```
USER: #S669 OPERATOR.SYS,OPERATOR    (NOT IN BREAK)
MPE VERSION: HP32033G.01.00  (BASE G.01.00).
CURRENT: MON, JAN 26, 1985, 3:50 PM
LOGON:   MON, JAN 26, 1985, 8:00 AM
CPU SECONDS: 37      CONNECT MINUTES: 467
$STDIN LDEV: 20      $STDLIST LDEV: 20
```

The second line tells you the base version number of your computer's operating system. You'll need to know it because, occasionally, how you operate the computer depends upon which version of MPE you're using. On page 1-2, record the base number that appears in parentheses on your screen.

IMPORTANT

Messages appear continuously on the Console. Sometimes, the colon prompt isn't reprinted on the screen after they're displayed. To get the prompt, simply press Return.

What Information Does The Console Display?

As Operator, you must have at your fingertips all the information you need to monitor and control computer activity. The messages that automatically appear on the Console are unique. At other terminals, users don't get any information unless they ask for it.

When you ask for information at the Console, you get a complete rundown on who's doing what. The information others get, even when they use the same commands you do, is limited. Try this simple example to demonstrate the difference:

At the Console, type: **SHOWOUT,SP** Return

If anyone is using the printer, you'll get a list of the reports that they've requested. (At this stage of the game, the description won't seem very descriptive. Don't worry—it's explained in Chapter Four.)

```
DEV/CL    DFID     JOBNUM  FNAME     STATE FRM SPACE RANK PRI #C
LP        #05875   #J111   $STDLIST  OPENED      2048      8   1
LP        #05925   #S2576  LP        OPENED      2048      8   1
SERIALP   #05635   #J705   $STDLIST  READY        100    D 5   1
LP        #05509   #J709   $STDLIST  READY        172    D 3   1

                        (and some other information)
```

Or, in the unlikely event that no one is using the printer, the computer will tell you that there are "NO SUCH FILE(S)".

Ask someone to type the same command, SHOWOUT SP, at their terminal. If they're waiting for a report to be printed, the computer will describe it, and no others, in this form:

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C
PP       #0377   #S139   SLP      READY      1436    1   8   1
```

If they're not, the computer will respond that it finds "NO SUCH FILES" belonging to that person. Someone else could be printing a report—they just won't get any information about it.

Finding Out More About OPERATOR.SYS

Besides password information, there are two other basic things that you should find out about OPERATOR.SYS:

- What capabilities is OPERATOR.SYS assigned?
- What Operator commands is OPERATOR.SYS allowed?

What Capabilities Is OPERATOR.SYS Assigned?

The capabilities that your computer identity is assigned determines what kinds of things you can do with the computer. For example, if you aren't assigned SF ("Save Files") capability, you can't save information in a computer file. To find out what capabilities OPERATOR.SYS is assigned,

type: RUN LISTDIR5.PUB.SYS [Return]

Does the computer send you this message?

```
PROGRAM FILE LISTDIR5.PUB.SYS NOT FOUND. (CIERR 622)
```

Check your typing, and check the version number of your operating system, recorded on page 1-2. If the version number begins with the letter E or F,

type: **RUN LISTDIR2.PUB.SYS** Return

When you're successful, the computer starts the LISTDIR5 (or LISTDIR2) "utility program" by displaying this:

```
LISTDIR5 G.01.00 (C) HEWLETT-PACKARD CO., 1983
TYPE 'HELP' FOR AID

>_
  ↑ (note the new prompt)
```

IMPORTANT

The special prompt is significant. As long as you see it, you are no longer talking to the MPE operating system. Instead, you're using a program that's designed to give you information that MPE doesn't provide directly. Also, the commands you've been using won't work, but a new set is available to you. More important, to return to MPE, you must end the LISTDIR5 program.

At the ">" prompt, type: **LISTUSER** Return

The computer will describe OPERATOR.SYS, like this:

```
>LISTUSER (what you typed)
**********************
USER: OPERATOR.SYS

HOME GROUP: OPERATOR     PASSWORD: **
MAX PRI: 150             LOC ATTR: 0
LOGON CNT: 1
CAP: AM,AL,GL,DI,OP,CV,UV,CS,ND,SF,IA,BA,PH,DS,MR
LOGON GROUP: OPERATOR    SESSION #:669     ↑ (these are capabilities;
LOGON DEV#: 20                               yours may be different)
```

Each two-letter code indicates one capability. Record this list on page 1-2 so that you can refer back to it. (For an explanation of capabilities, refer to the NEWACCT command described in the MPE Commands Reference Manual, Part Number 32033-90006.)

Check For System Supervisor Capability

Look at your list of capabilities again. In the next few chapters you will be specifically asked to check whether or not you're assigned OP ("System Supervisor") capability. If it appears in this list, you are; if not, you aren't.

At the ">" prompt, type: **EXIT** Return

You'll see the message "END OF PROGRAM", and then the colon prompt will be reprinted on your screen.

What Commands Is OPERATOR.SYS Allowed?

Many of the commands you'll use to operate the computer can be successfully typed only at the Console. If you're not using the Console, and you type one of these commands, the computer will respond:

```
EXECUTING THIS COMMAND BY OTHER THAN THE MASTER OPERATOR
 REQUIRES PERMISSION VIA THE ALLOW COMMAND. (CIERR 3000)
```

You can, however, "allow" yourself a command so that you can type it at any terminal, and not just the Console. The next page tells you how. First, though, find out what commands you've been already "allowed":

type: **SHOWALLOW** Return

If, for example, you're allowed the ABORTIO, ABORTJOB, and LIMIT commands, the computer responds:

```
#Snnn   OPERATOR.SYS
    USER HAS THE FOLLOWING COMMANDS ALLOWED:
ABORTIO           ABORTJOB          LIMIT
```

The computer also tells you what commands all users have been allowed. For example:

```
THE FOLLOWING COMMANDS HAVE BEEN GLOBALLY ALLOWED:
ABORTIO           ABORTJOB
```

If the list for OPERATOR.SYS doesn't include the CONSOLE, ABORTIO, and ABORTJOB commands, follow the directions below to make sure you can use them. If it does, record the list of commands you're allowed on page 1-2, and go on to "Controlling System Activity From The Console", on the next page.

Make Sure You Can Use The CONSOLE, ABORTIO, and ABORTJOB Commands

Type: SHOWALLOW Return

Check the list of commands you have been allowed. If necessary, add the CONSOLE, ABORTIO, and ABORTJOB commands to the list. (Be sure to specify the commands you've already been allowed in addition to the new ones.)

Type: ALLOW OPERATOR.SYS;COMMANDS=CONSOLE,

and: ABORTIO,ABORTJOB,

and: *(any other commands already listed)* Return

Check the list again by typing: SHOWALLOW Return

The list for OPERATOR.SYS should now include any commands you were allowed before, as well as the three new ones. Record the commands you're allowed on page 1-2.

Controlling System Activity From the Console

Using special commands, some of which can only be executed from the Console, you can control the computer and how it's used. For example:

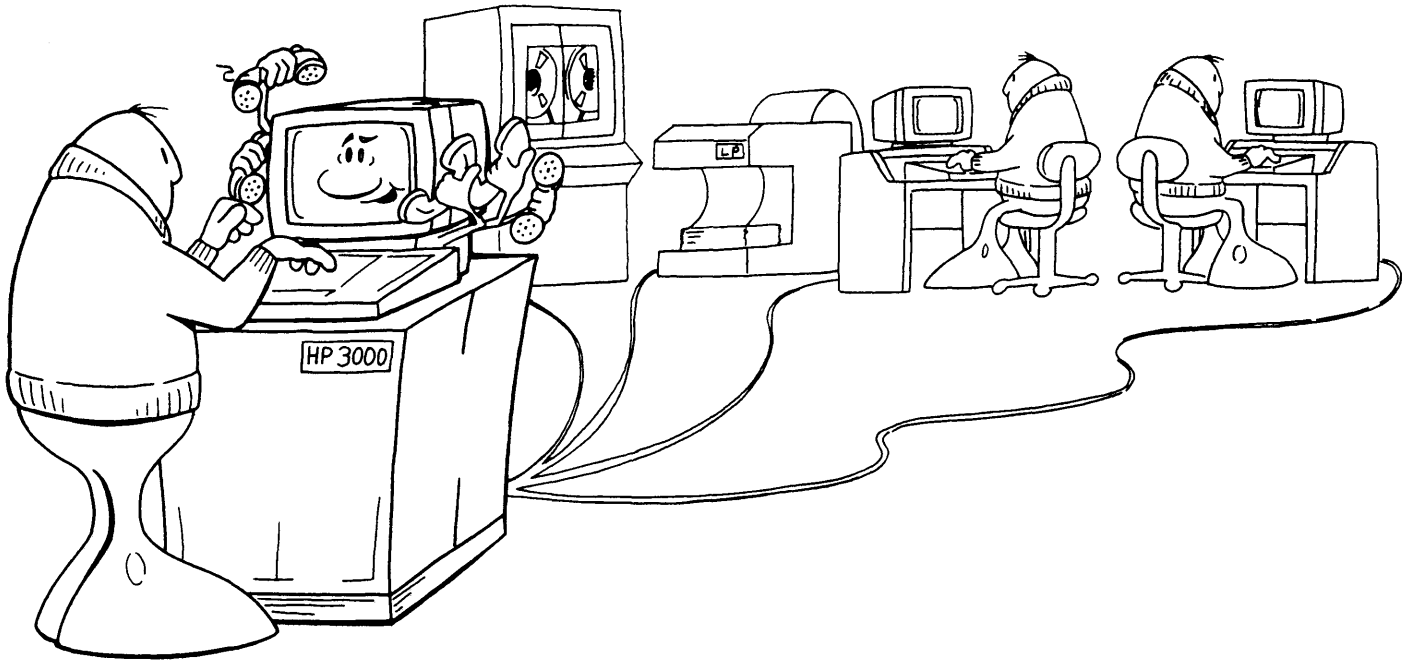
- Chapter Two teaches you how to stop a session.
- Chapter Three teaches you how to create, start, stop, and schedule jobs.
- Chapter Four teaches you how to control the printer.
- Chapters Five and Six teach you how to handle tapes and determine who can use the tape drive.
- Chapter Seven teaches you how to duplicate all the information stored in the computer.
- Chapters Eight and Nine show you how to start and shut down the entire computer system.
- Chapter Ten teaches you how to fix a terminal or the Console when it isn't working. You'll also learn the warning signs that indicate a possible system failure, and how to recover from it.

Most of these tasks must be done at the Console. But, anyone using the Console can do them. Since you can't watch the Console every minute, work with your System Manager to devise a method to protect it from misuse.

Messages from the Computer System

When you use a standard terminal, your relationship to the computer is pretty much one-sided. You give it instructions, or commands, and it responds to them. Sometimes the response is an error message, which is the computer's way of telling you it doesn't understand. Otherwise, it does what you want.

The Console is different. It is your computer's message center, and the hub of most computer system activity. As a result, information is displayed on the Console even when you don't specifically ask for it.



Most messages are generated by the computer system itself, reporting system activity and, occasionally, warning you when something is wrong. Sometimes, though, users will send you messages. Some of these are for your information only, others you'll respond to.

When Messages Appear

Console messages appear at any time, sometimes right in the middle of other information. Don't worry. The message may be hard to read, but it won't affect what you're doing.

Frequently, messages appear immediately after you've typed something. That's because while you are typing, and until you press Return, messages are suppressed. Since you're accustomed to getting a response to your commands, it's easy to confuse the Console message and the information you specifically asked for. Most of the time, the information in the Console message is completely unrelated.

Console messages may worry or annoy you at first. Once you get used to them, and become comfortable operating the computer, you'll know which messages warrant close attention and which deserve only passing interest.

Looking Back At Messages You Missed

Messages appear continuously, yet your Console screen can only display one "page" of information at a time.

If you're away from the Console for a little while, or for any other reason need to check your messages, you can look back at them.

To look back, press the [SHIFT] and [▼] keys simultaneously.

Or, press the [ROLL DOWN] key.

This causes the information on the screen to move down, exposing the messages that have rolled up and off the screen. You can look back at one line at a time, or scan quickly by holding the key(s) down for a few seconds. When you reach the limit of the Console's memory, the screen "freezes".

To look ahead, press the [SHIFT] and [▲] keys simultaneously.

Or, press the [ROLL UP] key.

IMPORTANT

How many messages you'll be able to see depends upon your Console. Some terminals have a long memory. With these, you can look back at several pages of information. Others have a short memory, and keep track of a few pages.

Messages About Sessions

Users can start and end sessions without your assistance. To keep you informed, the computer sends you logon and logoff messages at the Console. For example:

```
16:08/#S32/171/LOGON FOR: ERIC.JONES ON LDEV #27

21:24/#S32/171/LOGOFF ON LDEV #27
```

↑ *(Eric's session number; note the "S")*

↑ *(Eric's terminal)*

Job-Related Messages

You'll also receive messages about jobs at the Console. Just like sessions, they log on and log off the computer:

```
14:24/#J31/104/LOGON FOR: MGR.PAYROLL ON LDEV #10.

14:30/#J31/104/LOGOFF ON LDEV #10.
        ↑ (the job number; note the "J")
```

Jobs can also be "introduced" to the computer. In this case, the computer keeps track of them, but they won't actually log on until later. If a job is introduced, you'll see a message like this:

```
14:35/#J250/193/DEFERRED JOB INTRODUCED ON LDEV #10.
        ↑ (the job number)
```

Password Messages

Passwords are sometimes assigned to users, groups, and accounts. Only people who know the password(s) can use a computer identity to start a session or job. You may already have discovered this: the SYS account, which you use (as "OPERATOR.SYS"), is usually protected by a password.

When starting a session, users are given three chances to type passwords correctly. If someone mistypes a password, or if the person doesn't know it and tries to guess, the computer sends a message like this to the Console:

```
10:56/#S420/77/INVALID PASS FOR "MANAGER.SYS,PUB" ON LDEV "25"
  ↑      ↑                          ↑                  ↑
(the time) (the session number)   (the computer identity)   (the terminal)
```

Each time the password is typed incorrectly, this message is repeated.

The same password(s) used to start a session are required to start a job. Password(s) are included in the first line of the job file, so the user has only one chance, instead of three, to get them right. If the password(s) are omitted from the first line, the computer sends a "MISSING PASS" message to the Console:

```
11:21/#S32/83/MISSING PASS FOR "MYJOB,USER.SYS,PUB" ON LDEV "10"
                                      ↑ (the job name)
```

If the password is incorrect, you'll see this:

```
11:21/#S32/83/INVALID PASS FOR "MYJOB,USER.SYS,PUB" ON LDEV "10"
                                      ↑ (the job name)
```

Pay close attention to invalid or missing password messages. Although people may occasionally mistype a password, frequent password messages pertaining to one account may mean that someone is trying to gain access to protected computer information.

If you can, check with your System Manager to find out which accounts are "sensitive". He or she may want you to keep a record of certain password violations and report any recurring problems.

System Logging Messages

Your computer may be set up to keep track of system activity by recording specific events in a "log file". If so, the computer periodically sends messages like this to the Console:

```
LOG FILE LOG3067 IS 20% FULL.
          ↑ (your log file number will be different)
```

You can command the computer to tell you which log file is being used. To do so,

type: **SHOWLOG** Return

Did the computer tell you that "EXECUTING THIS COMMAND REQUIRES OP CAPABILITY"? If so, you'll only be able to observe system logging messages. Skip to the next section, "LDEV NOT READY Messages".

Otherwise, the computer tells you which log file is "on", or being used:

```
LOG FILE LOGnnnn IS ON.
          ↑ (the number of your log file)
```

When the log file is full, the computer automatically closes it and opens a new one. But, you can command the computer to close one log file and open a new one at any time.

Type: SWITCHLOG Return

The computer will tell you that a new log file is on.

"LDEV NOT READY" Messages

Messages such as "LDEV 25 NOT READY" are more than just information; they warn you of potential problems.

If you see an LDEV NOT READY message:

- Find out where the problem is. Most of the time, it will be a printer or tape drive. The discussion "Controlling Peripheral Devices From The Console", which begins on page 1-35, introduces you to your computer equipment. Once familiar with it, you can quickly determine which device isn't ready.
- Check for obvious problems first. Frequently, the solution is simple, and once you've used the equipment awhile, you'll know what to check. Chapter Four describes the printer and the printing process; Chapters Five and Six describe how to use the tape drive.

Messages From Users

Messages that computer users send you typically require you to respond. Most of the time, they will ask about the tape drive or printer—devices that you control. People using the computer also can send you general information messages. Take a look at these first.

Tellop Messages

To send you a message, users type the TELLOP command followed by the text of their message. What these "Tellop messages" say is completely up to the people who send them; your computer doesn't come with a built-in censor!

Below is a sample Tellop message:

```
20:01/#S14/46/FROM/PAT.SMITH/How soon is system shutdown?
  ↑       ↑
(the time) (Pat's session number)
```

Each part tells you something about the message and the person who sent it:

`20:01` The time the message was sent, using a 24-hour (military) clock.

`#S14` The number assigned to session when this person logged onto the computer. Each session has its own unique number.

46	The "process identification number", or PIN, another way the computer identifies this message.
PAT.SMITH	The identity of the person who sent you the message.
How soon...	The message that Pat Smith typed at her terminal.

To answer a message like this, you would use the TELL command, the session number or computer identity of the person you're responding to, followed by your message. For more information, refer to "Communicating With Computer Users" in Chapter Two.

Tape Requests

Of all devices connected to the computer, you have the most direct control over the tape drive. Users must formally ask to use it via a message that is sent to the Console. This message, called a "tape request", may or may not be automatically answered by the computer. If it is, then you only need to prepare the tape and tape drive for use. If it isn't answered by the computer, then you must respond to the tape request in addition to preparing the tape. (To find out how, refer to Chapter Five.)

Below is an example of a tape request. It, like all requests, begins with a question mark.

```
?14:57/#S25/43/LDEV# FOR "T" ON CTAPE (NUM), WRITE RING (Y/N)
   ↑       ↑   ↑ (the PIN, or "process identification number")
(the time)  (the session number)
```

All Console messages, not just requests, include a process identification number, or PIN. It is particularly important in Console requests because you'll answer each one using its PIN.

For more information about tape requests and using the tape drive, refer to Chapters Five and Six.

Forms Requests

Another message that may appear on your Console is a "forms request". It asks you to insert a different type of paper into the printer to complete a specific task. For example, if your company's payroll checks are printed on the computer, you'll need to replace the standard printer paper with check blanks.

You may get as many as three messages that are all part of a single forms request. For example, the first message, below, is from the program that calculates the payroll. It asks you to insert, or mount, the check blanks onto the printer.

```
10:20/#J29/FORMS; PLEASE MOUNT PAYROLL CHECKS
```

The next message, from the computer system, asks you which printer will be used to print the checks:

```
?10:20/#77/21/#SP12/LDEV# FOR #S29; OUTFILE ON LP (NUM)?
```

The final message, shown below, reminds you to doublecheck the alignment of the paper:

```
?10:26/#77/98/LDEV #25 FORMS ALIGNED OK (Y/N)?
```

For complete information about forms requests, refer to "Using Special Forms" in Chapter Four.

Checking For Console Requests

Requests to use the tape drive or to mount new printer forms are collectively called "Console requests". The RECALL command tells the computer to list the Console requests that you missed or haven't yet responded to.

Hold down CTRL and type: A

When the "=" prompt appears, type: RECALL Return

IMPORTANT

If you typed everything correctly and the computer still replies "*INVALID*", try it again. Computers sometimes behave strangely. In fact, they seem to be particularly adept at acting up when you're trying something new.

In response, you might find out that there are "NO REPLIES PENDING". But, if someone does need your help, the computer will list Console requests, or pending replies, like this:

```
THE FOLLOWING REPLIES ARE PENDING:
#14:57/#S25/#3/LDEV# FOR "T" ON CTAPE (NUM), WRITE RING? (Y/N)
```

When the computer responds to the RECALL command, it won't automatically print the colon prompt on the screen. To get the prompt again, press Return.

To respond to a request, you'll type REPLY and some other information on the Console. For specific instructions:

- Read "Handling Forms Requests", page 4-75 in Chapter Four, to answer forms requests.
- Read "Respond To The Tape Request", page 5-12 in Chapter Five, to tell the user the tape drive is available.
- Read "Telling The User The Tape Drive Is Unavailable", page 6-29 in Chapter Six.

When To Check For Requests

You should answer Console requests promptly. Until you do, the person who needs the tape drive or new printer paper can't do any other computer work.

For now, use the clues below to help determine when and how often to check for messages. In time, familiarity with your computer system and its users will be your best guide.

- If you're away from the Console for awhile, check for requests as soon as you return.
- If you know that there's a heavy demand for the tape drive, check every 5 minutes, or carefully watch the Console for messages.
- Formally schedule jobs that require a different kind of printer paper or ask users to warn you in advance. When the time arrives, have the proper forms on hand so that you can quickly make the switch.

IMPORTANT

If too many requests accumulate, it will overload the computer's message system and 'hang" the Console, making it unuseable. If the Console hangs, you may have to restart the computer system.

Controlling Peripheral Devices from the Console

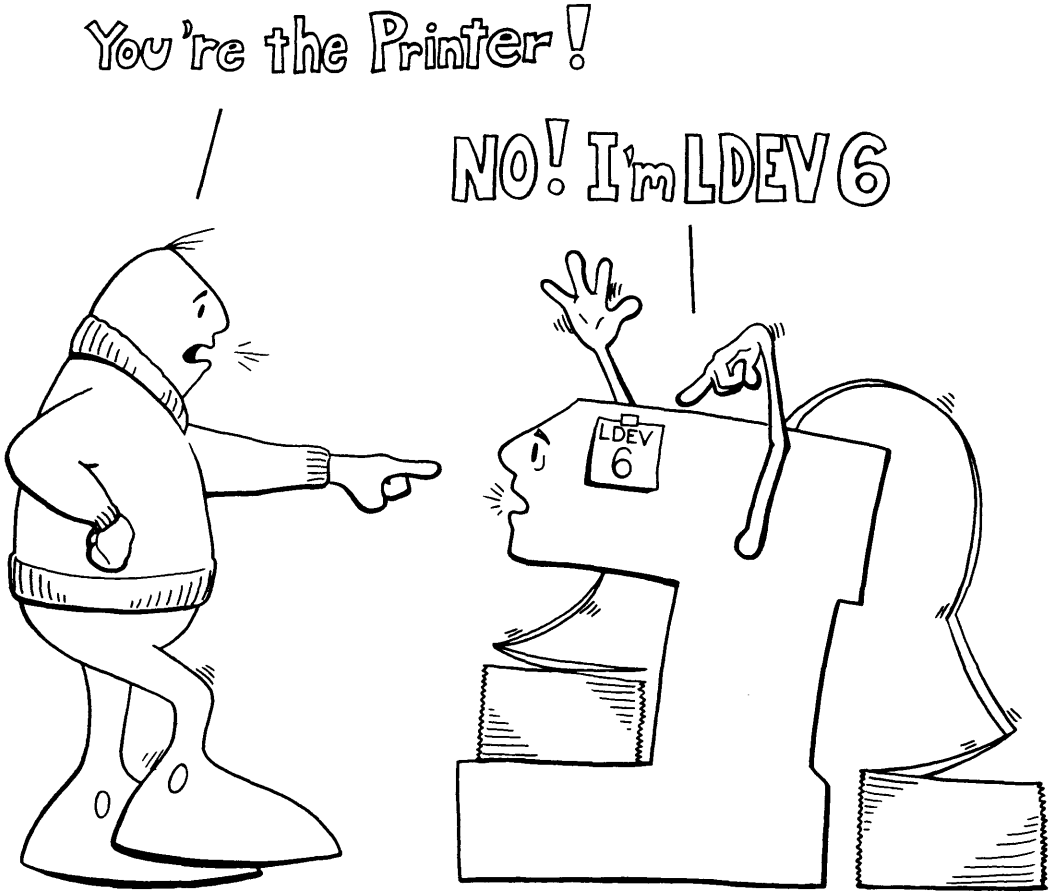
From the Console, you control two important peripheral devices: the printer and tape drive. They will require more of your attention than other devices, such as disc drives, because they are used frequently, and because they're shared among all computer users.

The computer helps you manage the printer and tape drive by sending status messages to the Console. To understand these messages, you need to know how the computer refers to your printer and tape drive.

What's In A Name?

Computers are very literal. You must tell them precisely what to do, when, and how.

Precision counts when you refer to any of the devices connected to the computer, too. That's why each device is assigned a unique LDEV number.



This is one case where you need to relate to the computer on its terms. It may be the printer to you, but it's LDEV 6 to the computer.

Fortunately, peripheral devices are also assigned certain common "device class names". For example, the Console is assigned the device class name CONSOLE.

Type: SHOWDEV CONSOLE Return

```
LDEV   AVAIL     OWNERSHIP     VOLID          DEN     ASSOCIATION

 20    AVAIL
 ↑ (the LDEV number of the Console)
```

You are literally asking the computer to "show you the device" known as the Console. The computer responded with useful information (and not an error message) because you used a device class name it understands: CONSOLE.

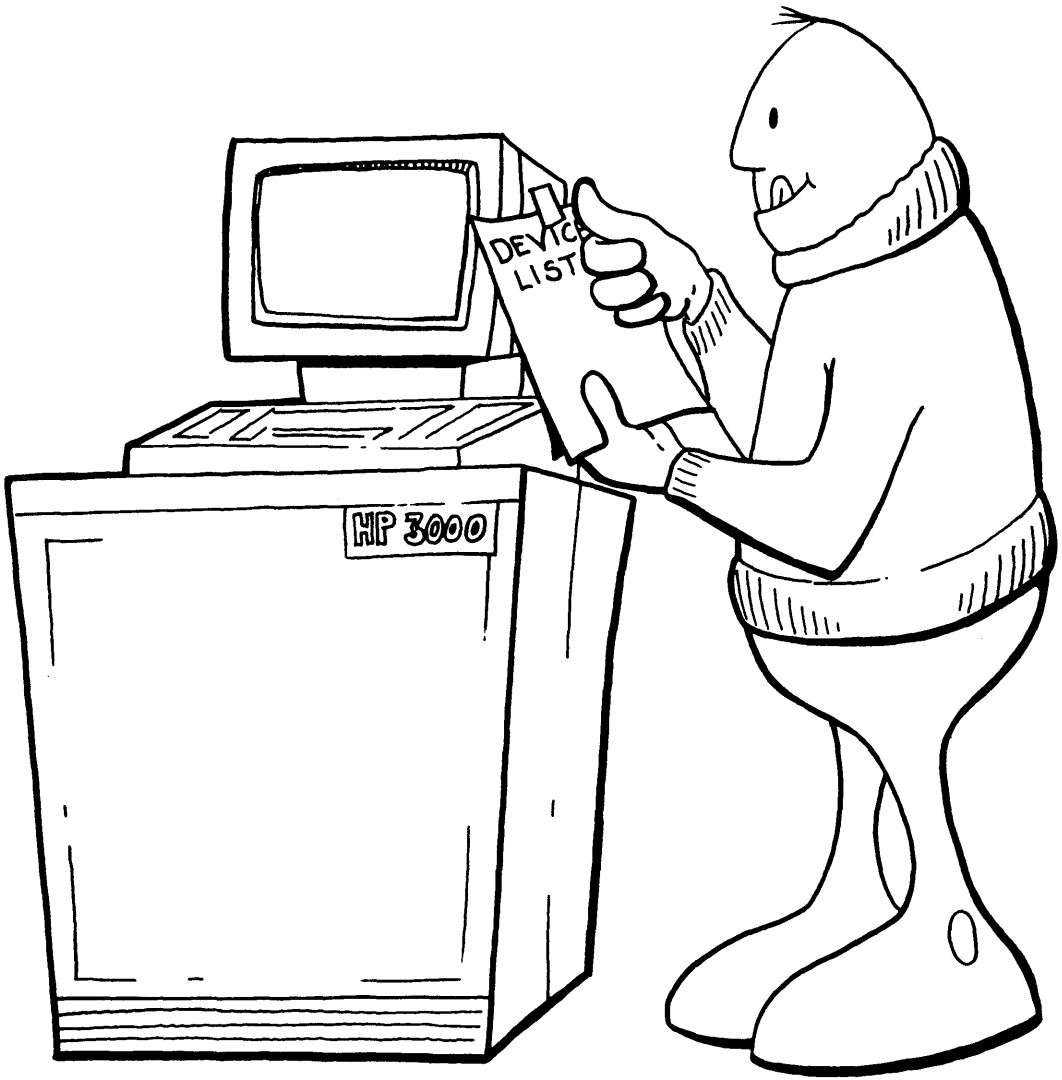
Creating A Complete List Of Devices

Check the list of capabilities for OPERATOR.SYS on page 1-2. (If you didn't record your capabilities, go back to "What Capabilities Is OPERATOR.SYS Assigned?" to check them.) If you find "OP", follow the directions on the next page to create a list of devices.

IMPORTANT

If you're not assigned OP capability, ask your System Manager for an "I/O device list" and post the list near the Console.

You can list your computer's peripheral devices on the Console screen or print the list on paper. If you're unfamiliar with your computer system, it's better to print the list on paper and tape it to your Console. This way, you can quickly look up LDEV numbers and device class names as you need them.



Type: SHOWDEV LP Return
↑ *(this stands for "line printer")*

If you see the message below, you'll have to print the list on your Console screen, instead of the printer:

```
:SHOWDEV LP  (what you typed)
         ^
LOGICAL DEVICE CLASS "LP" CANNOT BE FOUND ON THE SYSTEM.
(CIERR 1583)
```

In this case, type: SYSDUMP $NULL Return

Skip to the top of page 1-42 and follow the directions for answering the first question, "ANY CHANGES?".

Did you see the message below instead?

```
:SHOWDEV LP  (what you typed)
LDEV      AVAIL      OWNERSHIP      VOLID        DEN     ASSOCIATION
nn        SPOOLED    SPOOLER OUT
↑ (the LDEV number of your printer; check your screen)
```

This means that at least one of your printers is named "LP"; don't be concerned if more than one is listed.

Type: SHOWOUT SP;DEV=nn Return
↑ *(use the LDEV number from your screen)*

Look at just the last few lines of information on your screen. One of them will tell you the "outfence" for that printer is. For example:

```
OUTFENCE = 7
           ↑ (check the number on your screen)
```

The outfence, and how it affects the printing process, is fully explained in Chapter Four. If it's set to 6 or 7, begin the Sysdump dialog by following the directions below. If it isn't,

type: OUTFENCE 7;LDEV=nn Return

↑ *(use your printer's LDEV number)*

Begin The Sysdump Dialog

Press Return

At the colon prompt,

type: FILE SYSDLIST;DEV=LP,13 Return

Then type: SYSDUMP $NULL,*SYSDLIST Return

↑ *(be sure to type the asterisk)*

If you misspell "$NULL", you'll see the error message below. Don't worry, just repeat the SYSDUMP command.

```
DUMPFILE NOT A BACK-REFERENCED FILE. (CIERR 646)
```

If you mistype "SYSDLIST", you'll see this error message:

```
UNABLE TO FIND A FILE COMMAND FOR (   ).OPERATOR.SYS (CIERR 209)
                                    ↑ (the word you typed)
```

Check your screen to see if you typed the FILE command correctly. If necessary, retype it, then repeat the SYSDUMP command. If the FILE command is correct, just retype the SYSDUMP command.

IMPORTANT

If at any point you make a mistake, see something different from the example below, or just want to abandon the process, press the [BREAK] or [Reset/Break] key. Then, when the colon prompt appears,

type: A B O R T [Return]

The computer responds:

```
PROGRAM ABORTED PER USER REQUEST. (CIERR 989)
```

The colon prompt is reprinted on your screen so that you can restart the dialog or go on to something else.

You'll know you've successfully started the Sysdump dialog when you see:

```
ANY CHANGES? _
```

Answer by typing: **Y** Return

Answer the next two questions by pressing Return:

```
SYSTEM ID = HP32033G.01.00?
MEMORY SIZE = 4096 (MIN=nnn, MAX=nnn)?
```

Answer the next two questions by typing: **Y** Return

```
I/O CONFIGURATION CHANGES?
LIST I/O DEVICES?
```

If you're printing the list, nothing will happen for a moment, then the next question will appear. Skip to "End The Dialog" on the next page.

Controlling The Screen Display

If you're "printing" the list on your Console screen, the information will be immediately displayed. If it's a long list, you may want to stop it before the end by "freezing" the screen.

To stop the display, hold down CTRL and type: **S**

To look back through the list, "scroll" the display down by holding down the [SHIFT] and [▼] keys, or pressing the [ROLL DOWN] key.

To "scroll" the screen up, hold down the [SHIFT] and [▲] keys, or press the [ROLL UP] key.

To let the computer know you're ready for more information (to "unfreeze" the screen), hold down [CTRL] and type: **Q**

End The Dialog

The last question you'll see before you end the dialog is this:

```
LIST CS DEVICES?_
```

To end the dialog, find the [BREAK] or [Reset/Break] key on your keyboard and press it. A colon prompt will appear on your screen.

At the colon prompt, type: **ABORT** [Return]

```
PROGRAM ABORTED PER USER REQUEST.  (CIERR 989)
:_
```

Go to your printer, get the list, and tape it to your Console.

Check Your Device List

The device list is a "map" to your computer system. The first column lists each device by LDEV number. The last column on the right displays all the device class names assigned to it.

IMPORTANT

The other columns of information aren't explained in this Guide. For more information about computer devices, and specifically "system configuration", read Section V and Section VII of the MPE V System Operation And Resource Management Reference Manual (Part Number 32033-90005).

Check the LDEV numbers and device class names in your list against the information on the next page. There will probably be some similarities, but don't expect the names and numbers to be identical.

The purpose of some of these device class names may not make sense to you right now. As you read through the Guide, and refer back to this explanation and your own device list, they will become more meaningful.

Common Device Class Names		
LDEV #	Device Class Names	Purpose
1	SYSDISC SPOOL	Where the operating system and other important programs are stored. Also where reports waiting to be printed are stored.
3	CTAPE SDISC JOBTAPE DDUMP	On the Series 37, the cartridge tape drive. If it's the only tape drive, it is also used to submit jobs to the computer, and to store the contents of main memory after a system failure.
6	LP	The line printer.
7	TAPE SDISC DDUMP	On larger computers, the reel tape drive. It's used to store the contents of main memory after a system failure.
10	JOBTAPE	A special device used to submit jobs to the computer. LDEV 10 is a "psuedo device"; you won't find a piece of computer equipment that fits this description.
20	CONSOLE TERM	The system Console, also a terminal.

A Note On "Configuration"

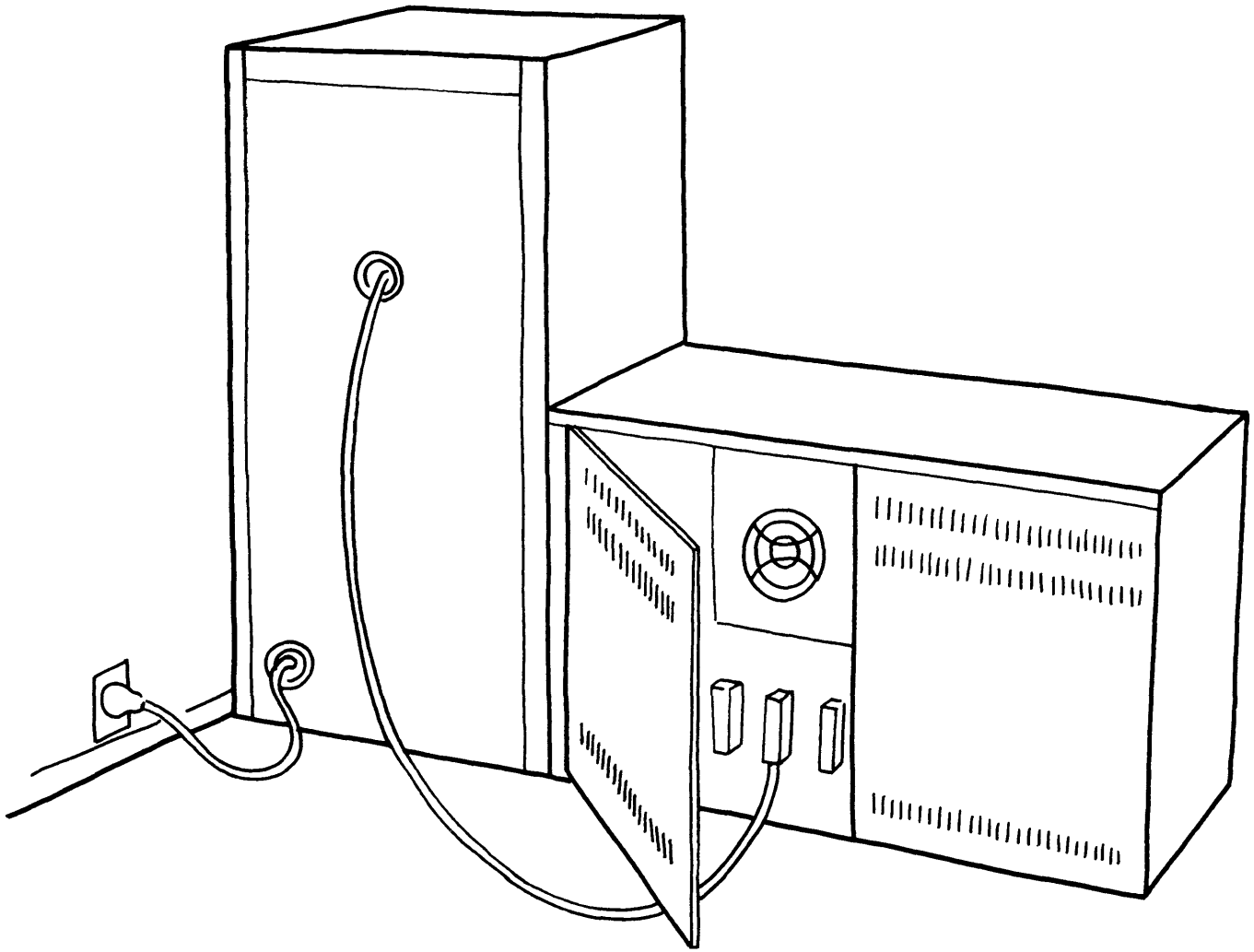
We've talked about devices being connected to your computer. You probably visualize this as the actual physical connection—a terminal, printer, or tape drive being plugged into your computer. True, devices have to be plugged in, both to the power socket in the wall, and into the computer. But it involves a bit more, which is where the term "configuration" comes in.

Your computer system is composed of both hardware (the part you can kick, though it's not a good idea!) and software, (the operating system) which gives the computer its "intelligence". To be configured, devices must be:

- Physically connected to the computer;
- Recognizable by the operating system.

To use an analogy, suppose the nerves in your right hand no longer transmitted any messages to the brain. The hand would still exist, but your brain wouldn't know it was there or even what it could, or should, do.

Similarly, the computer won't know that a printer is connected to it unless you tell it that the printer exists. Device configuration is the process of describing the printer in terms that are meaningful to the operating system. The other entries in the device list complete the description. Once configured, the computer can "talk to" the printer, and you can use it to produce reports.



Using Device Class Names To Figure Out LDEV Numbers On The Series 37 Computer

If you're operating a Series 37 computer system, you can easily find out the logical device numbers of your tape drive and printer. If you're using another model of the HP 3000 computer, follow the directions for "Investigating LDEV Numbers On Large Computer Systems" on page 1-50.

Investigate And Label Your Printer

Type: SHOWDEV LP Return
↑ *(this stands for "Line Printer")*

You're likely to see a description of just one printer, like this:

```
:SHOWDEV LP (what you typed)
LDEV      AVAIL      OWNERSHIP      VOLID        DEN     ASSOCIATION
nn        SPOOLED    SPOOLER OUT
↑ (a number; check your screen)
```

The number that appears on your screen is the LDEV number of your printer. Write the LDEV number on a small piece of paper or label and attach it to the printer where it can be clearly seen. Next, record the number on page 1-2, then skip to page 1-50 to investigate your tape drive.

IMPORTANT

If more than one printer is listed, follow the directions for producing an "LDEV NOT READY" message in "Investigating LDEV Numbers On Large Computer Systems" on page 1-50.

You may see the message below:

```
:SH0WDEV LP (what you typed)
         ^
LOGICAL DEVICE CLASS "LP" CANNOT BE FOUND ON THE SYSTEM.
(CIERR 1583)
```

In this case, check the list of peripheral devices and look for one of these device class names:

- SERIALP, which stands for "Serial Line Printer".
- EPOC, which stands for "Electrophotographic Output For Computers", a common name for laser printers.
- PP, which stands for "Page Printer", another common name for laser printers. (Laser printers print one page at a time, line printers print one line at a time; hence the names.)
- Or, any other name that remotely resembles the word "PRINTER".

If you see any of these names, check the LDEV number that corresponds to it; in all probability, that's the LDEV number of your printer. Label the printer and record this LDEV number on page 1-2.

If you don't have a list, or if none of the names above appear on it, read "Investigating LDEV Numbers On Large Computer Systems" on the next page.

Investigate And Label Your Tape Drive

Type: SHOWDEV CTAPE Return
↑ *(this stands for "cartridge tape")*

In almost all cases, the computer will respond by describing your cartridge tape drive in a message similar to the one below:

```
:SHOWDEV CTAPE (what you typed)
LDEV      AVAIL      OWNERSHIP      VOLID        DEN     ASSOCIATION
nn        UNAVAIL
↑ (a number; check your screen)
```

The number that appears on your screen is the LDEV number of your tape drive. Write the LDEV number on a small piece of paper or label and attach it to the tape drive where it can be clearly seen. Next, record the number on page 1-2, then read about "Special Console Commands" on page 1-52.

Investigating LDEV Numbers On Large Computer Systems

If you haven't been able to figure out which device is which, you have one more opportunity to investigate LDEV numbers on your own. If this doesn't work, you'll have to ask for help.

Printers and tape drives are either "online" (ready for use) or "offline" (not ready). When you take them offline, a message like this almost always appears on the Console:

```
LDEV nn NOT READY
     ↑ (the LDEV number of your printer)
```

By matching the LDEV number in the message to the device, you can label your printers and tape drives one by one. If you're game, keep reading.

Investigate Your Printers

If you're using a printer that isn't manufactured by Hewlett-Packard, the directions below probably won't help you. If someone can assist you, great. If not, skip to the next section and investigate the printers later.

If you are using a Hewlett-Packard printer:

1. Find the "ON LINE", "OFF LINE", or "HALT" button on your printer.
2. Press the button. If the printer was printing something, it will stop. Don't worry about it.
3. Go to the Console and check for a NOT READY message. Label the printer with the number that appears in the message, and record the number on page 1-2.
4. After you've recorded the LDEV number, go back to the printer and press the ON LINE button again, or press the RUN button. The printing process will resume.

IMPORTANT

If the message doesn't appear within a few seconds, put the printer online for a moment then take it offline again. Check for a NOT READY message. If you still don't see one, put the printer back online and try your luck with another printer. If you can't get any information, ask your System Manager for help or go on to the next step: investigating your tape drives.

Repeat this procedure for each printer connected to your computer. When you've labelled all of them, continue reading.

Investigate Your Tape Drives

The easiest way to find out the LDEV number of a tape drive is to mount or insert a tape into the drive, and look for a message like this on the Console:

```
VOLUME (Unlabelled) MOUNTED ON LDEV #nn
                    (this is the LDEV number ↑
                          of your tape drive)
```

Once you see this message, it's a simple matter to record the number and label the tape drive.

The procedure for mounting or inserting a tape into your tape drive is explained in Chapter Five. To label your tape drives now, read the following sections in Chapter Five:

- For cartridge tapes, follow Steps One and Two, beginning on page 5-5.
- For reel tapes, follow Steps One, Two, and Three, beginning on page 5-22.

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

There are six Console commands. Three of these can only be typed at a special "=" prompt, called a "Control-A" prompt. The other three can be typed at either the Control-A prompt or the normal colon prompt.

To generate a Control-A prompt, hold down CTRL and type A

When the Control-A prompt is displayed on your screen, the commands you've been typing at the colon prompt no longer work. To see for yourself,

type: SHOWME Return

```
=SHOWME   (what you typed)
*INVALID*

      (notice that the colon won't automatically reappear)
```

To get the colon back, press Return a few times. If you get the "*INVALID*" message, don't worry about it. From the computer's point of view, pressing Return instead of typing one of the Console commands is an invalid entry. For you, it's the only way back to the colon prompt.

Full-Time Console Commands

Besides RECALL and REPLY, there are four other Console commands. Three of these can be typed only at the "=" prompt, hence the nickname "full-time Console commands".

IMPORTANT

DON'T try to type these commands at the "=" prompt now. They are extremely powerful, and must only be used during a standard system shutdown when you know exactly what you're doing.

Full-Time Console Commands	
LOGOFF	Automatically logs off everyone using the computer, including the Operator's session on the Console.
LOGON	Allows users to start sessions and jobs again after you have executed =LOGOFF.
SHUTDOWN	Shuts down the operating system, and logs everyone off.

If you try to type these at the colon prompt, the computer responds with this error message:

```
UNKNOWN COMMAND NAME  (CIERR 975).
```

Part-Time Console Commands

Three commands, two of which we've already introduced, are "part-time" Console commands. They can either be typed at the "=" or the colon prompt. The table below lists part-time Console commands.

Part-Time Console Commands	
RECALL	Lists all request messages that have been sent to the Console, called "Console requests".
REPLY	Allows you to respond to Console requests.
ABORTIO	The command you use as a "last resort" to fix a terminal, printer, or tape drive that isn't working.

RECALL and REPLY are discussed in Chapters Four, Five, and Six. ABORTIO is explained in Chapters Two and Nine.

Moving The Console

Type: CONSOLE Return

```
CONSOLE IS CURRENTLY ASSIGNED TO LDEV 20.
```

As you learned, this message tells you which terminal is the Console. You already may have guessed from the wording of the message that another terminal can be used as the Console.

What Moves?

You've probably been thinking of the Console as a piece of computer equipment. It is and it isn't.

It is, because the Console MUST be a terminal, and your computer MUST have a Console. Without one, monitoring and controlling system activity would be impossible. Some tasks, like shutting down the system or starting it again, can be done only at the Console. But, the Console isn't a piece of equipment in the same sense as the terminal and keyboard you use. This is because you can move the Console without physically moving anything at all (except your fingers, when you type the appropriate command.) So what is it?

The Console is a set of capabilities, including commands and two special prompts, that allow one terminal to communicate with and control the computer. These capabilities are typically assigned to LDEV 20. They can, with a single command, be switched to another terminal.

Make Sure You Control The Console

Before you try moving the Console, make sure you can move it back. Find out which commands you're allowed to type from any terminal, (listed on page 1-2). If it includes the CONSOLE command, skip to "How To Move The Console" on the next page. If it doesn't, or you didn't record the commands you're allowed, read "Make Sure You Can Use The CONSOLE, ABORTIO, and ABORTJOB Commands" on page 1-20.

How To Move The Console

Ask one of your neighbors if it's okay to move the Console to their terminal for a moment. Using their terminal's LDEV number, go back to the Console and type:

```
CONSOLE nn Return
```

↑ *(substitute the LDEV number of your neighbor's terminal)*

If you've succeeded, the message below will appear in two places: On the terminal you've been using as the Console and on the new Console:

```
CONSOLE HAS BEEN SWITCHED FROM LDEV 20 TO LDEV nn.
```

(the LDEV number of your ↑ neighbor's terminal)

Moving The Console Back

To switch the Console back to LDEV 20, stay at the original Console terminal (the one you're logged onto), and type:

```
CONSOLE 20 Return
```

The computer will tell you that the Console has been switched back to LDEV 20.

Looking Back

1. What three things make the Console different from a standard terminal?

2. What are some of the different messages you'll see at your Console?

3. What are Console requests, and why should you pay particular attention to them?

4. What are the two ways your computer refers to printers, tape and disc drives, and other computer equipment? How are they different?

5. What are the six special Console commands, and why can't you type them at other terminals?

Monitoring the Console Quick Reference

To Do:	Do This:
Find out who's using a terminal:	Type: SHOWME Return
Log onto a terminal:	Type: HELLO *(computer identity)* Return
Check your capabilities:	Type: RUN LISTDIR5.PUB.SYS Return and: LISTUSER Return and: EXIT Return
Check what commands you're allowed:	Type: SHOWALLOW Return
Allow yourself or others command(s):	Type: ALLOW *(computer identity)* ;COMMANDS = *(commands)*
Generate a Control-A ("=") prompt:	Hold down CTRL and type: A
List pending Console requests:	Hold down CTRL and type: A Type: RECALL Return
Check on a device:	Type: SHOWDEV nn Return *(the LDEV number)* ↑

To Do:	Do This:
Find out where the Console is:	Type: CONSOLE Return
Move the Console to another terminal:	Type: CONSOLE nn Return *(the terminal's LDEV number)* ↑
Create a complete list of computer devices:	1. Type: FILE SYSDLIST;DEV=LP,13 and: SYSDUMP $NULL,*SYSDLIST Return 2. When you see "ANY CHANGES?", type: YES Return 3. When you see "SYSTEM ID = HPnnnn"?, type: Return 4. When you see "MEMORY SIZE = nnnn?", type: Return 5. When you see "I/O CONFIGURATION CHANGES?", type: Y Return 6. When you see "LIST I/O DEVICES?", type: Y Return 7. When you see "LIST CS DEVICES?", press BREAK or Reset/Break 8. At the colon prompt, type: ABORT Return

Introduction To Chapter Two

This chapter explains computer sessions and teaches you how to monitor and control all session activity.

To start a computer session, type "HELLO" followed by your computer identity at a terminal. Almost always, the computer responds by telling you the version number of the MPE operating system, the day, date, and time, and a welcome message. When the colon prompt appears, the computer's ready to begin.

Begin what? Basically, a session is a two-way dialog between a person and the computer. The computer interprets and follows the commands you type at the keyboard, if it can. If it can't, it will tell you there's something wrong in an "error message". Computer sessions are unique in this respect: you have unlimited opportunity to make yourself understood. (On a bad day, this can seem like an unlimited opportunity to be frustrated!)

Most of the time, you'll just keep an eye on things by checking who's logged onto the computer, which terminal they're working at, and what other computer equipment they're using. Occasionally, though, you'll need to control how the computer is used by managing session activity. This chapter teaches you how to:

- Limit the number of sessions.
- Prevent people from starting new sessions.
- Stop someone's session.
- Send general and urgent messages to everyone, one person, or a group of people from the Console.
- Create the Welcome message.

2 Managing Sessions

Gathering Information About One Session

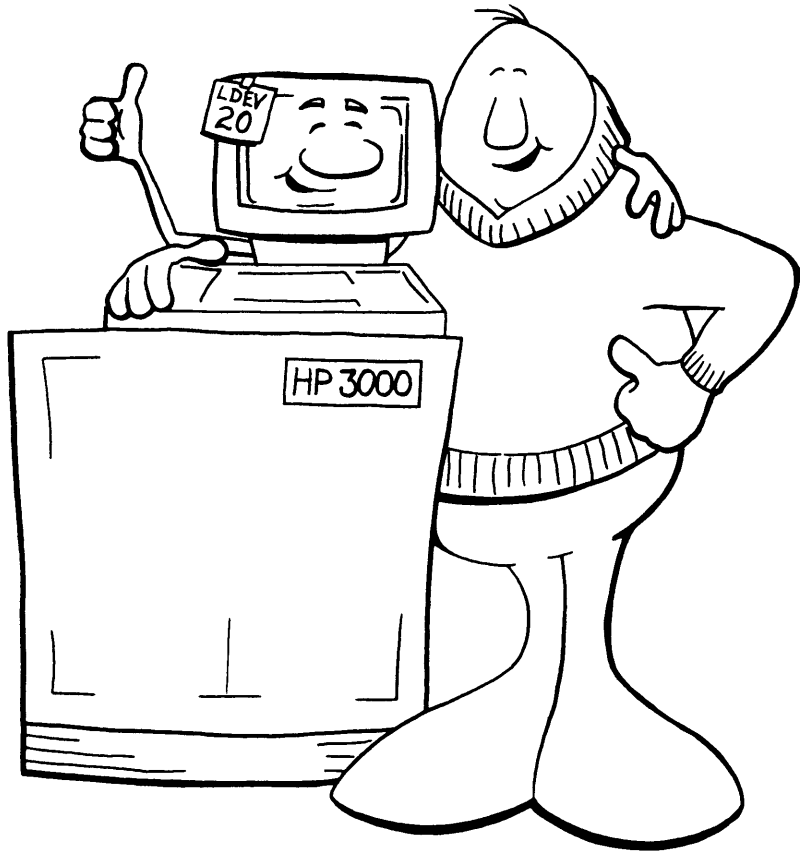
Since you're the Operator, you should be using the Console. To check, ask the computer for some information about your session, and find out the LDEV number of the Console.

Type: **CONSOLE** Return

and: **SHOWME** Return

```
:CONSOLE (what you typed)
CONSOLE IS CURRENTLY ASSIGNED TO LDEV nn.
                    (your Console's LDEV number) ↑

:SHOWME (what you typed)
USER: #S669,OPERATOR.SYS,OPERATOR  (NOT IN BREAK)
MPE VERSION: HP32033G.01.00  (BASE G.01.00).
CURRENT: THURSDAY, JAN 17, 1985, 12:01 PM
LOGON:   THURSDAY, JAN 17, 1985, 7:00 AM
CPU SECS: 3              CONNECT MINUTES: 351
$STDIN LDEV: nn            $STDLIST LDEV: nn
             ↑      (the LDEV number of the      ↑
                    terminal you're using)
```

Does the LDEV number of the Console match the LDEV number of your terminal? Is the "user" OPERATOR.SYS, your computer identity? If not, or if the computer tells you that it "EXPECTED HELLO...", refer to "Start Using Your System Console" in Chapter One.



The Console's "user" is almost always OPERATOR.SYS, and the Console is usually LDEV 20. This isn't true of standard terminals: LDEV numbers are assigned arbitrarily, and anyone can use any terminal so long as the computer recognizes their identity. So, when you type SHOWME at a standard terminal, the information you get will depend on who's using it.

Gathering Information About All Sessions

With a single command, you can get the same information SHOWME provided about everyone using the computer:

Type: **SHOWJOB JOB=@S** Return
↑ *(this means "all sessions")*

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#S669   EXEC        20  20       MON  8:22A  OPERATOR.SYS
#S434   EXEC        21  21       SUN 12:27P  BOB.CAROLL
#S425   EXEC        24  24       SUN  9:06A  JULIE.JONES
#S499   EXEC        26  26       SUN  1:39P  BRENDA.J
 ↑ (the "S" indicates that these are sessions)
```

Below the list of individual sessions, you'll see a summary of session activity:

```
 4 JOBS (DISPLAYED)
    0 INTRO
    0 WAIT; INCL 0 DEFERRED
    4 EXEC; INCL 4 SESSIONS
    0 SUSP
JOBFENCE= 6; JLIMIT= 3; SLIMIT= 12
```

The numbers on your Console are probably different because they reflect the level of activity on your computer. And, with the exception of the last line of information, the numbers will change as people log on and off the computer.

IMPORTANT

For simplicity, the computer refers to both sessions and jobs as "JOBS". That's why the SHOWJOB command tells you that five "JOBS" are displayed, even though sessions are listed.

Compare the two descriptions of your session: one from SHOWME and the other from SHOWJOB.

```
   :SHOWME  (what you typed)
            ②
 ① USER: #S669,OPERATOR.SYS,OPERATOR  (NOT IN BREAK)
   MPE VERSION: HP32033G.01.00  (BASE G.01.00).
   CURRENT: THURSDAY, JAN 16, 1985, 12:01 PM
   LOGON:   THURSDAY, JAN 16, 1985, 8:22 AM  ③
   CPU SECS: 23          CONNECT MINUTES: 269
   $STDIN LDEV: 20         $STDLIST LDEV: 20
                ④                        ⑤
```

```
:SHOWJOB JOB=OPERATOR.SYS  (what you typed)

JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#S669   EXEC        20  20       THU  8:22A  OPERATOR.SYS ①
  ②                 ④   ⑤            ③
```

① Your identity, OPERATOR.SYS.

② Your session number, which always begins with "#S".

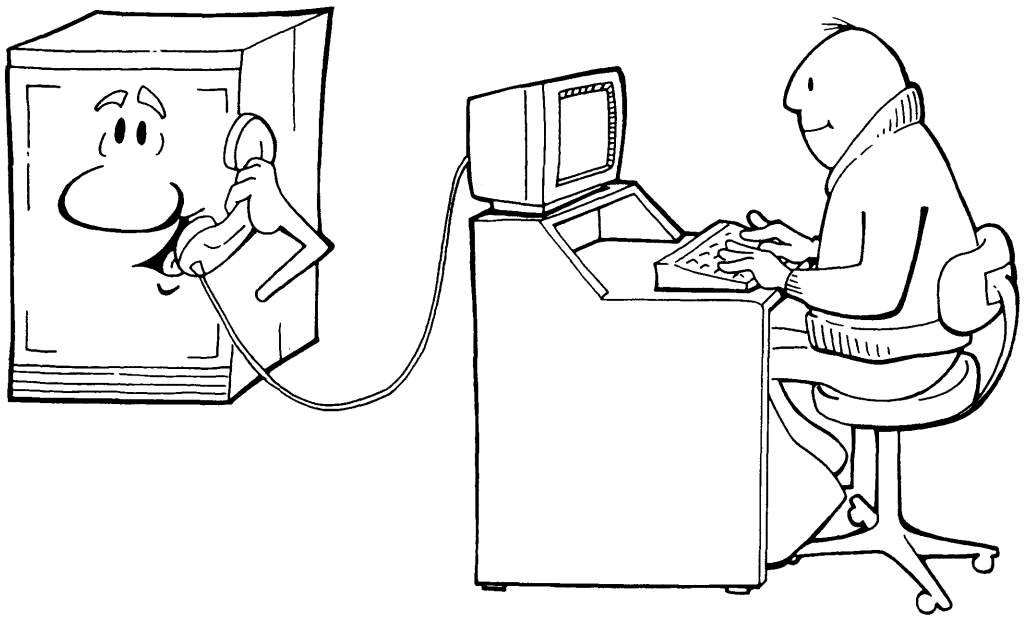
③ The time you typed the HELLO command. SHOWME also tells you the current time.

④ The LDEV number of the Console. You use the Console's keyboard to "input" information to the computer.

⑤ Also the LDEV number of the Console because the computer lists the information you ask for on your screen.

Getting Information To The Computer

During a session, you use a terminal's keyboard to type commands; they're sent to the computer when you press Return. The computer always assumes that there is someone to "talk to" at the terminal, so it sends information back to you by displaying it on your screen.



A terminal is the only device that allows you to interact with the computer. You may not get the reply you want, but the computer should respond pretty quickly. In fact, if there's no response at all, something's wrong.

More About Input Devices

Your terminal is called an "input device" because you use it to type, or "input", commands and information to the computer. The computer keeps track of input devices when they're in use.

Type: **SHOWME** Return

```
USER: #S669,OPERATOR.SYS,OPERATOR  (NOT IN BREAK)
MPE VERSION: HP32033G.01.00  (BASE G.01.00).
CURRENT: THURSDAY, JAN 16, 1985, 12:01 PM
LOGON:   THURSDAY, JAN 16, 1985, 8:22 AM
CPU SECS: 23          CONNECT MINUTES: 269
$STDIN LDEV: 20         $STDLIST LDEV: 20
             ↑ (your input device)
```

Now type: **SHOWJOB JOB=OPERATOR.SYS** Return

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#S669   EXEC        20  20       THU  8:22A  OPERATOR.SYS
                    ↑ (also your input device)
```

Notice that "$STDIN" (standard input device) and "JIN" (job input device) are two different names for the same thing: LDEV 20, which is the Console.

Getting A List Of Input Devices

Type: SHOWIN JOB=@S Return

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C
20       #I46    #S669   $STDIN   OPENED
21       #I64    #S434   $STDIN   OPENED
22       #I12    #S664   $STDIN   OPENED
24       #I54    #S425   $STDIN   OPENED
26       #I45    #S499   $STDIN   OPENED
         (a name for your terminal) ↑
```

This tells you a few things:

- How many terminals are in use.
- Each terminal's logical device number.
- Who is using which terminal. You're not given a computer identity like PAT.SMITH, but you are told the session number (listed in the JOBNUM column). To find out how to use it, read "Matching Input Devices To Users", below.

When a session ends, the entry describing the user's terminal is deleted from the list.

IMPORTANT

As long as someone is logged onto a terminal, the computer considers it in use. This is true if you're typing at the keyboard, or if you've left for lunch and didn't type BYE, which ends a session.

Matching Input Devices To Users

Again, type: SHOWIN_JOB=@S Return

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C
20       #I46    #S669   $STDIN   OPENED
21       #I64    #S434   $STDIN   OPENED
22       #I12    #S664   $STDIN   OPENED
24       #I54    #S425   $STDIN   OPENED
26       #I45    #S499   $STDIN   OPENED
                   ↑ (these are session numbers;
                     yours will be different)
```

If you want information about a particular session, you can ask for it using the session number. For example, if session #S499 were listed on your screen, you could ask for a complete description of it by typing:

SHOWJOB_#S499 Return

The format is familiar, but only one session would be described:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#S499   EXEC        26  26       SUN  1:39P  BRENDA.J

JOBFENCE= 6; JLIMIT= 3; SLIMIT= 12
```

Try this on your computer.

Type: SHOWJOB_JOB=@S Return

Pick a session number from the JOBNUM column on your screen, and ask the computer to describe just that session.

Type: SHOW JOB #nnn [Return]
↑ *(use a session number from your screen)*

Compare the information you get to the information you saw when all the sessions were listed.

If the list of sessions has rolled up and off your screen, you can look at it again by scrolling the display down.

Press the [SHIFT] and [▼] keys at the same time, or:

Press the [ROLL DOWN] key.

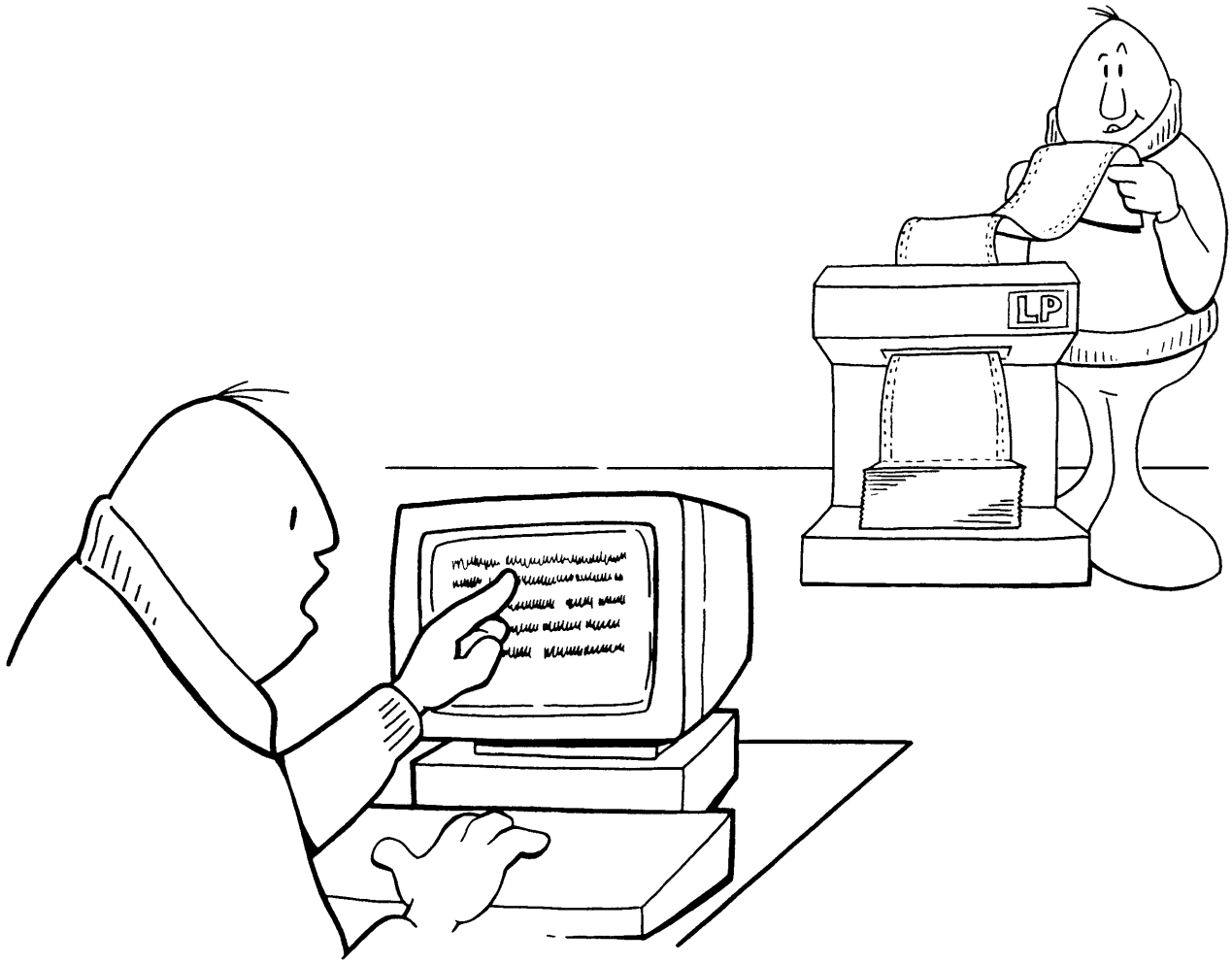
You can scan quickly by holding the key(s) down for a few seconds, or look back at just a few lines by pressing the keys for just a moment. When you reach the limit of the Console's memory, the screen "freezes".

To look ahead, press the [SHIFT] and [▲] keys simultaneously, or:

Press the [ROLL UP] key.

Getting Information From The Computer

Information from the computer is displayed on a terminal screen or printed in a report. Users control which form computer results take by choosing the output device: either their terminal or the printer.


LP

Listing Output Devices

Type: SHOWOUT JOB=@S Return

```
 DEV/CL    DFID     JOBNUM  FNAME     STATE  FRM SPACE RANK PRI #C
LP         #034     #S8     SLP       READY       1296       8
LP         #058     #S25    LISTOP    OPENED      2048    D  0    1
20         #053     #S669   $STDLIST  OPENED
21         #049     #S434   $STDLIST  OPENED
22         #056     #S664   $STDLIST  OPENED
24         #012     #S425   $STDLIST  OPENED
26         #025     #S499   $STDLIST  OPENED
↑ (these are              ↑ (these are session numbers)
  output devices)
```

If someone is printing a report, two kinds of output devices will be listed on your screen: terminals and the printer. In the sample above, the first two entries describe printed output. How can you tell?

- The last four columns of information are only used to describe printed reports. If they're blank, the information is being sent to a terminal.
- The first column describes where the information is going. For the first two entries, "LP", which stands for "Line Printer", is listed as the output device. Printers will usually be listed by device class name, and not LDEV number. Other names to look for (besides LP) are SERIALP, EPOC, PP, and other variations on the word "printer".

The last four columns, SPACE, RANK, PRI, and #C are used to describe printed reports. They are briefly explained below; for more information, refer to Chapter Four.

- SPACE tells you the size of the report. You won't get a page count; instead, you're told how much room on the disc is needed to store the report.
- RANK tells you when it was submitted for printing, or if it is "deferred". If two reports have the same priority, the first one submitted for printing is ranked higher than the second, and will be printed sooner.
- PRI is the printing priority assigned the report. A higher priority report will be printed before a report of lower priority, regardless when they were sent to the printer.
- #C is the number of copies the user wants.

Matching Output Devices To Users

Type: SHOWOUT;JOB=@S Return

```
DEV/CL   DFID    JOBNUM  FNAME     STATE  FRM SPACE RANK PRI #C
LP       #034    #S8     SLP       READY       1296       8
LP       #058    #S25    LISTOP    OPENED      2048    D 0    1
20       #053    #S669   $STDLIST  OPENED
21       #049    #S434   $STDLIST  OPENED
22       #056    #S664   $STDLIST  OPENED
24       #012    #S425   $STDLIST  OPENED
26       #025    #S499   $STDLIST  OPENED
                   ↑ (these are session numbers)
```

You won't see computer identities, but this list does show you session numbers. Using one of them, ask the computer for a description of that session:

Type: SHOWJOB #nnn Return
↑ *(use a session number from your screen)*

In this way, you can find out who's using which terminal.

Communicating With Computer Users

To help you manage the computer, you can transmit messages to the people using it in three ways:

- With the TELL command. Tell messages are useful when the message is important, but not urgent. They'll get through to most, but not all, users.
- With the WARN command. Warnings should only be sent when the message is urgent; everyone will see them.
- By creating and editing the Welcome message, which everyone sees when they start a computer session.

With the TELL and WARN commands, you can select which group of people will 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 can't select your audience for a Welcome message.

Sending Tell Messages

Use the TELL command to send messages that are important, but not urgent. They'll reach everyone except users who have asked the computer to suppress messages. To find out who these users are, refer to "Who Won't Get Tell Messages" on page 2-17.

Sending A Tell Message To Everyone

(this means "all sessions") ↓

Type: `TELL @S;This is a test` Return

If you make a typing mistake, you'll probably get one of these messages:

```
THERE WAS NO SESSION FOUND WHICH MATCHED THIS ID. (CIWARN 1619)
```

Or:

```
EXPECTED "@S". (CIERR 1613)
```

Don't worry about it. Just type the TELL command again.

If it works, the computer will reprint the colon prompt on the Console. Almost everyone else sees this:

```
FROM S/nnn OPERATOR.SYS/This is a test
        ↑ (your session number)
```

Your session number and identity tells everyone who sent the message. They don't need the information to respond to your messages, though. The TELLOP command, mentioned in Chapter One, allows people to send messages to the Console.

Sending A Tell Message To One Person

To send a message to only one person, you need either their computer identity or session number. To find out,

type: SHOWJOB JOB=@S Return

Pick any session number from the JOBNUM column, except your own, or the number of a session listed as "QUIET". Using that session number,

type: TELL #Snnn;This is a test Return
↑ *(use a number from your screen)*

Now, send the same message to the same person, using their computer identity from the JOB NAME column.

Type: TELL ( ) ;This is a test Return
↑ *(use a computer identity from your screen; DON'T include the parentheses)*

Who Won't Get Tell Messages?

Type: SHOWJOB JOB=@S Return

Tell messages won't reach people who have asked the computer to suppress messages. You'll know who they are: "QUIET" appears in the IPRI column as part of the description of their session. Look at the list of sessions on your screen. Are there any "quiet" users?

IMPORTANT

If you MUST get a message to a quiet user, send it with the WARN command. Warnings always reach people, regardless whether they've asked the computer to suppress messages or not. For instructions, refer to "Sending An Urgent Message", on page 2-20.

Sending A Tell Message To A Group

Type: SHOWJOB JOB=@S Return

Look at the computer identities in the JOB NAME column on your screen. There could be as many as three different parts to the job name. For example:

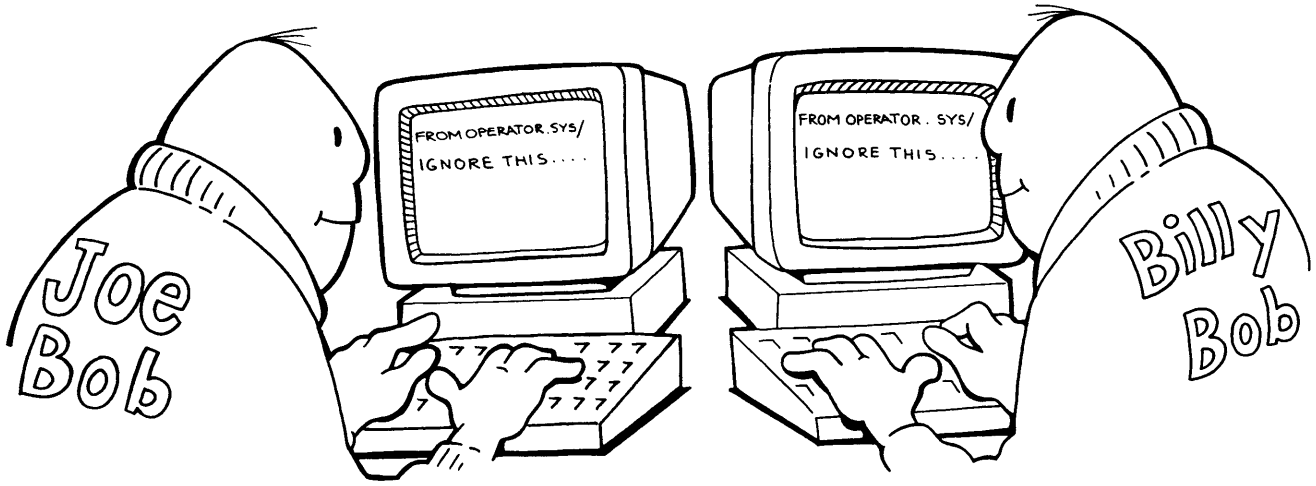
MARY,USER.ACCOUNT

↑ session name ↑ user name ↑ account name

You can send Tell messages to any group of two or more people that are using the same user name or account name. For example, if there are two people logged onto the account "BOB" you could send them one message:

Type: `TELL @.BOB;Ignore this message` Return

↑ *("everyone using the "BOB" account")*



Or, if two people are logged on as "BILLY", you could send both of them a message:

("everyone logged on as 'BILLY'") ↓

Type: `TELL BILLY.@;Ignore this, too` Return

Check your list of sessions. If two or more people are using the same user name or account, try sending them a message using the example above.

Sending A Long Tell Message

So far, the messages you've sent have been short—only one line. You can send a longer message, even one that extends past the length of a single line on your terminal. The trick is to press Return only after you've finished typing the entire message, and not at the end of each line.

Type: `TELL @S;Hi everyone, again. I'm`

and: `checking to see what happens if I`

and: `send a very long message using`

and: `the TELL command. I'll be through`

and: `with this experiment quickly.`

and: `Thanks for your patience.`

and now press Return

You undoubtedly noticed that the computer automatically "wrapped" the words around to the next line. The message also looks awkward because words are split when they're wrapped. Unfortunately, there's no way to prevent this from happening.

Type the message again, but this time press Return when you reach the end of the first line. What happened?

- The colon prompt reappeared on the Console as it normally would after you press Return at the end of a message.
- Your users got only part of the message. Take a look at one of their terminals to see.

Sending An Urgent Message

In critical situations, you can send an urgent message that everyone, regardless what they're doing, will receive at their terminals. Since urgent messages can interfere with important work, you should send them only when absolutely necessary.

IMPORTANT

DON'T try the examples of the WARN command now. Instead, use them for reference when you need to send a real warning to everyone.

Sending Everyone A Warning

To warn everyone to log off the computer immediately,

type: WARN @S:Please log off now! Return

↑ *(this means "all sessions")*

Sending One Person A Warning

If you have an urgent message for one person, you can use either their session number or computer identity to send them a warning. To find out the number or identity,

type: `SHOWJOB JOB=@S` Return

To send the warning,

type: `WARN #Snnn;Ignore this Warning` Return
↑ *(use the session number from your screen)*

or type: `WARN (  ) ;Ignore this warning` Return
↑ *(use a computer identity from your screen; DON'T include the parentheses)*

Sending A Warning To A Group

If two or more people are using the same account or user name, you can send them the same warning with one command. For example, to send everyone logged onto the account "ACCOUNT" a warning,

type: `WARN @.ACCOUNT;Ignore this` Return
↑ *("everyone using the 'ACCOUNT' account")*

How To Use The Welcome Message

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

- A message from the computer system acknowledging the "HELLO". This includes the date, time, and the version number of the computer's operating system.
- A "Welcome" message from you.

The Welcome message is a convenient way to transmit information of general interest. For example, you might tell everyone when you plan to perform a "system backup", a procedure for duplicating all the important information contained in your computer. Or, you could include your phone number in the message, so in case of trouble they can call you. (On the other hand, maybe you shouldn't!)

Erasing The Existing Welcome Message

To erase the existing Welcome message, type: **WELCOME** Return

When the "#" prompt appears, press Return

Creating A New Welcome Message

To create a new Welcome message, type: **WELCOME** Return

Wait for the "#" to appear on the screen, then begin creating your message. Use the sample on the next page to try it out.

Type: Welcome to the HP 3000. The Return

and: system will be shut down Monday Return

and: through Thursday at 8 PM to Return

and: do a partial backup, and at 5 PM Return

and: on Fridays for a full backup. Return

and: Please log off before then. Return

To end the message, press Return at the "#" prompt. The colon prompt will return to the screen.

To check the message, type: SHOWME Return

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

IMPORTANT

Before you create a Welcome message for your computer, be sure to erase this sample. Follow the directions for "Erasing The Existing Welcome Message" on the previous page.

Correcting A Mistake In The Welcome Message

If you make a mistake while typing, but don't catch the mistake until after you've gone onto another line or finished the message altogether, press Return. When another "#" appears, press Return again. When you see the colon prompt, erase the message using the directions on page 2-22. Then type in the message again. (Refer to "Creating A New Welcome Message" on the previous page.)

Creating A Welcome Message File

If you're using a version of MPE that begins with "G.01", you can also use the text editor, EDIT/3000, to create the Welcome message. In this case, you'll type the text into a file, save it, then tell the computer the name of the message file.

In the next example, you'll create the welcome message file called "WELCMSG". Before you begin, find out if you already have a file named WELCMSG.

Type: LISTF WELCMSG Return

If the computer lists a file named WELCMSG, pick another file name and substitute it for WELCMSG in the following examples. If the computer can't find any file named WELCMSG, type the commands exactly as shown below.

Begin the Editor program by typing: EDITOR Return

Notice the new prompt. It means you are using the Editor. You'll type the next several lines of information at this prompt, then end the Editor program to return to the colon prompt.

At the "/" prompt, type: ADD Return

The first line number, and the blinking cursor, will appear on your screen. This means you're in "add mode", and the computer expects you to add information, one line at a time, to a file. (Each time you press Return, a new line and line number appear.)

```
/ADD (what you typed)
     1      _
```

Type: Welcome to the HP 3000. System Return

and: will be shut down Monday through Return

and: Thursday at 8 PM to do a partial Return

and: backup, and 5 PM on Fridays for Return

and: a full backup. Please log off Return

and: // Return
↑ *(this ends add mode)*

At the "/" prompt, type: KEEP WELCMSG Return
(or substitute another ↑ file name)

End the Editor program by typing: EXIT Return

The computer will tell you that it has ended the program. Then it reprints the colon prompt on your screen.

IMPORTANT

To refresh your memory of the Editor, refer to Chapter Three of The Guide For The New User (Part Number 32033-90009) or the quick summary of Editor commands at the beginning of Chapter Three in this Guide.

In addition to creating the Welcome message file, you must tell the computer to use it. To do so,

type: WELCOME WELCMSG Return
↑ *(or substitute the name of the file you just created)*

To check the new Welcome message, type: SHOWME Return

In addition to the description of your session, you should see the Welcome message you just created. If you don't, go back to "Creating A Welcome Message File" (page 2-24) and try again.

IMPORTANT

Before you create your own Welcome message, erase this sample message by following the directions on page 2-22. If you want, you may also delete the file WELCMSG. To do so,

type: PURGE WELCMSG Return
↑ *(use your file name)*

Then use the sample message above as a guide for creating your own.

Restricting Session Activity

There are two ways you can control when people can log onto the computer: resetting the "session limit" and raising the "jobfence". These terms, and how you'll use limits and fences, are explained next.

When you start the computer, the maximum number of sessions allowed at one time is set automatically. This number reflects the size and power of your computer; the bigger the computer, the more sessions it can handle at one time.

To check the session limit, type: SHOWJOB STATUS Return

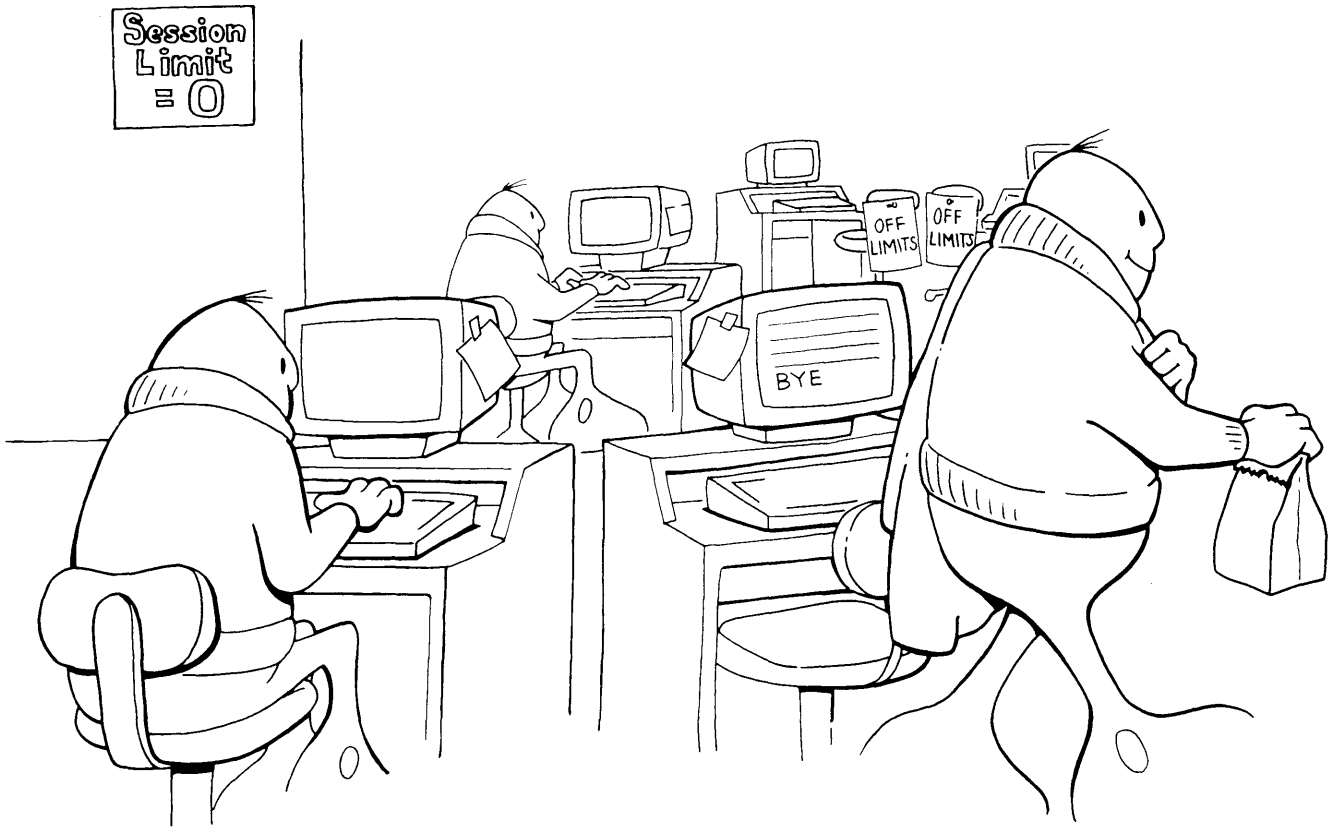
The last line of information on your screen gives you three important pieces of information: the numerical value of the jobfence, the job limit, and the session limit. Record all three numbers below:

JOBFENCE = _____

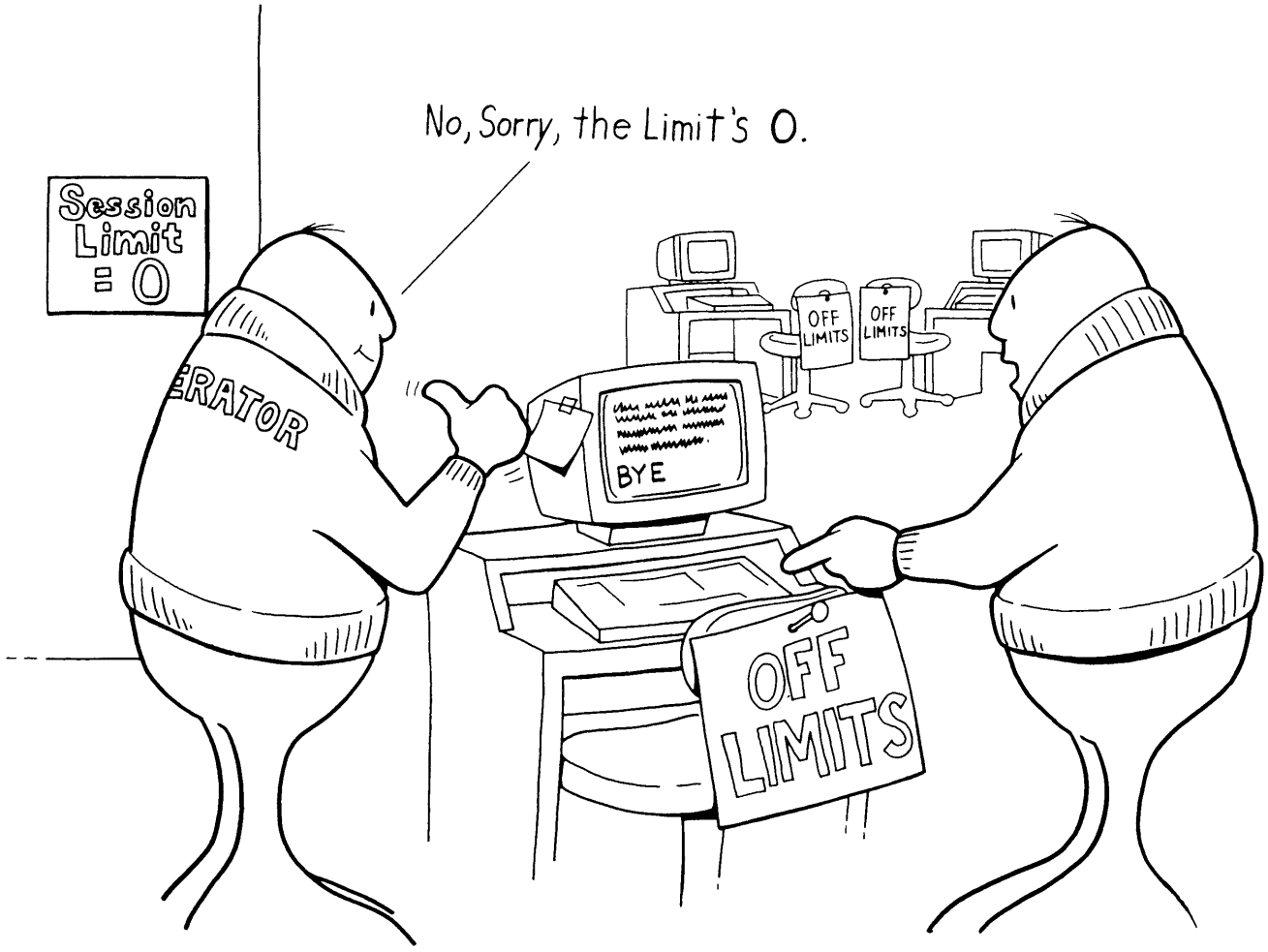
JLIMIT = _____

SLIMIT = _____

To restrict use of the computer, or to allow more people to use it, you can reset the session limit.


Session
Limit
=0
OFF
LIMITS
OFF
LIMITS
BYE

Resetting the session limit does NOT affect people using the computer. It only affects people trying to start a new session when the number of people already using the computer is equal to (or exceeds) the limit.



Setting The Session Limit To 0

You can set the session limit to any number, but most of the time, you'll either leave it alone or change it to 0. This prevents all but a few special users from starting new sessions on the computer—regardless of how many are currently using it.

Before you lower the session limit, though, make sure you're one of the special users who can bypass it, just in case you accidentally log off while the session limit's still set to 0. To do so, look at the list of capabilities assigned to OPERATOR.SYS on page 1-2. If it doesn't include OP ("System Supervisor") capability, DON'T lower the session limit. If you didn't write down your capabilities, go back to Chapter One and read "What Capabilities Is OPERATOR.SYS Assigned?" before continuing.

To lower the session limit to 0, type: **LIMIT ,0** Return

IMPORTANT

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

To check the new limit, type: **SHOWJOB STATUS** Return

```
13 JOBS
    0 INTRO; 0 SCHEDULED
    0 WAIT; INCL 0 DEFERRED
   13 EXEC; INCL 10 SESSIONS
    0 SUSP
JOBFENCE= 6; JLIMIT= 3; SLIMIT= 0
                  (the new session limit; ↑
                     the other numbers
                      may be different)
```

Remember, no one already using the computer will be affected by the low session limit. But, anyone who tries to log on (except people assigned OP capability, like you) will see this message after they type HELLO:

```
CAN'T INITIATE NEW SESSIONS NOW.
```

How To Bypass The Session Limit

Check your capabilities on page 1-2. (If you didn't write them down, go back to Chapter One and read "What Capabilities Is OPERATOR.SYS Assigned?") If you're assigned OP capability, you can start a new session on the computer, even when the session limit is set to 0.

IMPORTANT

Don't type the next command if you're not assigned OP capability. You'll end one session, and won't be able to start a new one.

Type: `HELLO OPERATOR.SYS;HIPRI` Return

↑ *(this means "high priority")*

Adding ";HIPRI" to the end of your computer identity tells the computer to bypass whatever restrictions are in effect (including a low session limit and a high jobfence, which you'll learn about next.) This is known as a "high priority logon".

Reset The Session Limit

Before continuing, reset the session limit to its normal value. Using the number you recorded on page 2-27,

type: `LIMIT ,nn` Return

↑ *(use your original session limit)*

Raising The Jobfence To Prevent New Sessions

A second way to limit the number of sessions is to raise the jobfence to its highest value, 14. This prevents all but those users who are assigned OP capability from starting a computer session. It won't affect people already using the computer.

To raise the jobfence, type: **JOBFENCE 14** Return

Wait for the colon, then type: **SHOWJOB STATUS** Return

```
13 JOBS
    0 INTRO; 0 SCHEDULED
    0 WAIT; INCL 0 DEFERRED
   13 EXEC; INCL 10 SESSIONS
    0 SUSP
JOBFENCE=14; JLIMIT= 3; SLIMIT= 12
          ↑ (the new jobfence; the other
            numbers may be different)
```

How To Override The Jobfence

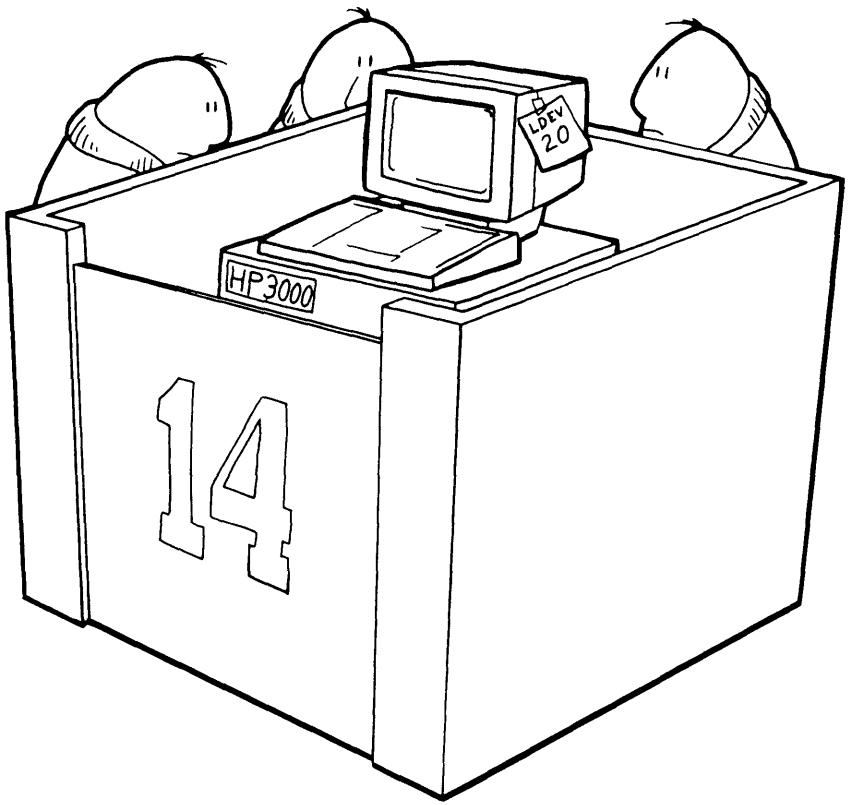
Check the list of capabilities for OPERATOR.SYS written on page 1-2. (If you didn't write them down, go back to Chapter One and read "What Capabilities Is OPERATOR.SYS Assigned?") If you're assigned OP capability, you can override the maximum jobfence and start a new computer session.

IMPORTANT

Don't type the next command if you're not assigned OP capability. You'll end one session and won't be able to start a new one.

Type: **HELLO OPERATOR.SYS;HIPRI** Return

↑ *(this means "high priority")*



Reset The Jobfence

Before continuing, reset the jobfence to its original value. Using the number you recorded on page 2-27,

type: JOBFENCE nn Return
↑ *(use your original jobfence)*

Check it by typing: SHOWJOB STATUS Return

Aborting A Session

From the Console, you can stop, or abort, someone's session. Aborting a session is an emergency measure. Usually, it's only one in a series of steps you take to handle a specific situation. For example, aborting a session is the last resort when you're troubleshooting a "hung", or unresponsive, terminal (explained in Chapter 10.) Or, you may need to abort someone's session to shutdown the computer (explained in Chapter Nine).

Whatever the reason, you need at least a computer identity or session number to abort someone's session. If someone asks you to fix their terminal, they'll give you this information. If you're aborting a session as part of the shutdown procedure, you can get it easily: the session(s) you'll abort are the last few listed when you type the SHOWJOB command, which gives you both session numbers and identities.

IMPORTANT

To teach you how to abort a session, an imaginary situation is described in the next few pages. Read through this example, but don't try it. If you unexpectedly abort someone's session, they won't be very happy with you.

Step One: Use SHOWJOB To Get More Information

Suppose the payroll manager can't get her terminal to work. Use the SHOWJOB command to find out more information about her session.

Type: SHOWJOB JOB=@S Return

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#S669   EXEC       20   20       MON  8:22A  OPERATOR.SYS
#S434   EXEC       22   22       SUN 12:27P  BOB.CAROLL
#S425   EXEC       24   24       SUN  9:06A  JULIE.JONES
#S664   EXEC       23   23       MON  8:07A  MGR.PAYROLL
  ↑ (her session      ↑    ↑                        ↑ (her identity)
    number)      (her terminal's LDEV number)
```

IMPORTANT

The payroll manager's session won't look any different from the others when you check computer activity. For this reason, you typically won't know there's a problem until someone with a hung terminal comes to you and reports it.

Step Two: Type The ABORTJOB Command

Use the session number you found with the SHOWJOB command to abort the payroll manager's session.

Type: ABORTJOB #S664 Return

↑ *(the payroll manager's session number)*

No message is sent to the Console telling you that Session #664 has been aborted. You should get a logoff message like the one below, although it may take a few seconds.

```
13:54/#S664/32/LOGOFF ON LDEV #23
  ↑        ↑                  ↑
(the time,  (the payroll manager's      (the hung terminal)
or when     session number)
you typed
ABORTJOB)
```

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

Step Three: Check Again With SHOWJOB

At the Console, type: SHOWJOB #S664 Return

The computer only keeps track of active sessions. Since you aborted Session #664, the computer should tell you that there are "NO SUCH JOBS". If it doesn't, repeat Steps Two and Three.

Once the session is aborted, a new one can be started on the terminal unless some sort of hardware repair is necessary. (This rarely happens. A hung terminal can almost always be fixed by aborting the session.)

Aborting A Session On Your Computer

Use the four steps listed below to abort a session on your computer when the need arises:

1. Type: SHOWJOB JOB=@S Return to find the session number.
2. Using that number, type: ABORTJOB #Snnn Return
3. Look for a logoff message on the Console.
4. Type: SHOWJOB #Snnn Return to make sure that there are "NO SUCH JOBS".

Stopping All Sessions In An Emergency

Hopefully, you'll never be forced to shut down the computer system without warning your users. Just in case, the SHUTDOWN command will simultaneously log off all users, stop all jobs, and stop your session at the Console.

IMPORTANT

Don't try this now. Just read through it for your information only.

Hold down [CONTROL] and type: **A**

When the "=" prompt appears, type: **SHUTDOWN** [Return]

The computer logs off all jobs and sessions, including your own. You'll see a "SESSION ABORTED BY SYSTEM MANAGEMENT" message on the Console, which tells you your session has been stopped. You'll also receive a logoff message about your session because, regardless whether you're using the Console or not, it's still your computer's message center.

Typing the SHUTDOWN command is the last in a complete series of steps that you perform to shutdown the computer system. To learn how, read Chapter Nine.

Looking Back

1. What information can you get from both the SHOWME and SHOWJOB commands?

2. What three kinds of messages can you send to users, and what command do you use to send them?

3. What are the two different ways you can prevent people from starting new computer sessions?

4. What do you need to override the restrictions on session activity, and what do you type to do so?

5. Under what circumstances would you abort a session, and how would you do it?

Managing Sessions Quick Reference

To Do:	Do This:
Find out who's using a terminal:	Type: **SHOWME** Return
List all sessions:	Type: **SHOWJOB JOB=@S** Return
Find out the job limit, session limit, and jobfence:	Type: **SHOWJOB STATUS**
Keep people from starting new computer sessions:	Type: **LIMIT ,0** Return Or type: **JOBFENCE 14** Return
Bypass the session limit or jobfence:	Type: **HELLO OPERATOR.SYS;HIPRI** Return
Send a Tell message to everyone:	Type: **TELL @S;** *(text of message)* Return
Send everyone logged onto the same account a Tell message:	Type: **TELL @.** *(account name)* **;** *(message text)* Return
Send a warning to everyone:	Type: **WARN @S;** *(text of message)* Return

To Do:	Do This:
Send everyone logged onto the same account a warning:	Type: WARN @. *(account name)* ; *(message text)* Return
Create a Welcome message interactively:	1. Type: WELCOME Return 2. At the "#" prompt, type your message, ending each line by pressing Return. 3. When you're through, press Return at the "#" prompt. The colon prompt will reappear on your screen.
Create a Welcome message file:	1. Type: EDITOR Return 2. When the "/" appears, type: ADD Return 3. Type in your message, ending each line by pressing Return 4. When you're through, type: // Return 5. Type: KEEP *(filename)* Return 6. End the Editor by typing: EXIT Return 7. At the colon prompt, type: WELCOME *(filename)* Return
Erase the existing Welcome message:	1. Type: WELCOME Return 2. At the "#" prompt, type: Return 3. Then type: Return

To Do:	Do This:
Edit a Welcome message file:	1. Type: EDITOR Return 2. When the "/" appears, type: TEXT *(filename)* Return 3. Type: LIST ALL Return 4. Type: MODIFY n Return ↑ *(the number of the line you want to edit)* 5. Modify the line. 6. When you're through modifying the file, press Return 7. Type: KEEP *(filename)* Return 8. Type: YES Return to purge the old version of the file. 9. Type: EXIT Return
Get rid of a Welcome message file:	Type: PURGE *(filename)* Return
Abort a session:	Type: ABORTJOB #Snnn Return ↑ *(the session number)*
Stop all sessions, and all system activity, in an emergency:	Hold down CTRL and type: A Type: SHUTDOWN Return

Introduction To Chapter Three

In this chapter you'll create and control your own job and learn how to manage it and other users' jobs.

A job is a sequence of instructions that you give the computer to process. It's similar to a list of chores: "First, shop for groceries, second, pick up clothes from the cleaners, third, mow the lawn..." etc. In the same way you write down each chore, you must record the instructions the computer needs to execute the job. When you store this information in a "job file", you create a job.

Creating a list of chores and actually doing them are two different things. In the same way, creating a job and telling the computer to process it are different. You can do the same set of chores on a regular basis, and in fact, you probably do. By saving a job file, you can repeat the same job regularly. Simply tell the computer what job to do, then go on with your other work. You'll get two things done at once.

You may create jobs to help you with your own work, or you may have inherited some that were already being used to simplify routine procedures. Whether or not you create or use jobs, you can control all jobs in the following ways:

- Start and schedule jobs.
- Limit the number of jobs the computer processes.
- Prevent users from starting new jobs.
- Suspend and resume the processing of any or all jobs.
- Choose the order in which jobs are processed.
- Halt one job or all jobs.

3 Managing Jobs

Keeping Track of Jobs

Type: SHOWJOB @J Return
(this means "all jobs") ↑

The computer may report that there are no jobs with the message "NO SUCH JOB(S)". Otherwise, you'll see a description of each one like this:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J10    EXEC        105 LP       WED 11:29P  MAILMAN.HPOFFICE
#J46    WAIT  D 1     105 LP       WED 12:18P  JOB1,USER.ACCOUNT
#J55    SUSP        105 LP       WED  9:08A  ARJOB,MGR.ACTRECV
  ↑       ↑ (this tells you what's happening to the job)
(these are
job numbers)
```

Jobs that the computer is currently processing are listed as "EXEC", or executing. Jobs that the computer was processing, but are now suspended, are listed as "SUSP". Jobs that the computer hasn't begun yet are listed as "WAIT", or waiting. If any jobs are scheduled to begin later, they'll be listed directly below the others in a separate section, like this:

```
CURRENT:  3/ 4/85 13:35

JOBNUM  STATE IPRI JIN  JLIST   SCHEDULED-INTRO  JOB NAME

#J13    SCHED    8  105 LP       3/ 4/85  20:00  MYJOB,OPERATOR.SYS
```

Record The Jobfence, Job Limit, And Session Limit

The bottom half of your screen summarizes job activity:

```
 3 JOBS:
    0 INTRO
    1 WAIT; INCL 1 DEFERRED
    1 EXEC; INCL 0 SESSIONS
    1 SUSP
JOBFENCE= 6; JLIMIT= 3; SLIMIT= 12
```

Although the numbers on your screen may be different, the last line reports three important pieces of information. Chapter Two introduced you to the jobfence and session limit ("SLIMIT"). This chapter teaches you how to use the job limit ("JLIMIT") and the jobfence to control job processing.

Record the jobfence, job limit, and session limit displayed on your Console. You'll refer to these numbers throughout this chapter.

JOBFENCE = _____

JOB LIMIT = _____

SESSION LIMIT = _____

Understanding The List Of Jobs

Sessions are either executing (meaning someone is logged onto the computer) or they're not listed at all. By contrast, the computer keeps track of suspended, waiting, and scheduled jobs, in addition to those that are executing. This variety of "processing states" allows you to control jobs in more ways than sessions.

You can ask the computer to list only those jobs in one processing state, for example, all waiting jobs. You'll either be told that there are "NO SUCH JOB(S)", or just those you asked for will be listed.

IMPORTANT

When you ask for a list of executing jobs, it will include both jobs and sessions since you also use the SHOWJOB command to monitor session activity.

To list executing jobs, type: SHOWJOB EXEC Return

To list suspended jobs, type: SHOWJOB SUSP Return

To list waiting jobs, type: SHOWJOB WAIT Return

To list scheduled jobs, type: SHOWJOB SCHED Return

If the computer didn't understand the last command, you'll see this message:

```
EXPECTED ONE OF JOB, SUSP, INTRO, WAIT, EXEC, OR STATUS.
  (CIERR 1511)
```

Unless you mistyped "SCHED", the message means that you cannot schedule jobs on your computer. To check, look at the version number of your operating system. (It should be written on page 1-2. If not, refer to "What Version Of The MPE Operating System Is The Computer Using?" in Chapter One.) The version number must begin with "G.01" to permit job scheduling on your computer.

Creating a Job

To create a job, you use the Editor to type computer instructions into a file. Steps One through Six, below, take you through the complete process. You'll end up with a simple job file named "MYJOB".

IMPORTANT

"MYJOB" is an arbitrary file name that's used in these examples because it's easy to remember. Before you begin, find out if you already have a file named MYJOB.

Type: LISTF MYJOB.@ Return

Wait a few seconds for the computer to respond. If it tells you that there are "NO SUCH FILE(S)", then follow the examples exactly as shown. If any files are listed, then use another file name that's easy for you to remember. Make sure you substitute the name you choose wherever you see "MYJOB" in the following examples.

A Recap Of Editor Commands

In the next few pages, you'll use EDIT/3000 to create and modify a job file. To refresh your memory, here is a brief recap of Editor commands:

To start the Editor, type: **E D I T / 3 0 0 R** Return

Once you're using the Editor, you can type any of these commands at the "/" prompt:

ADD	Start a new file.
TEXT	Tell the computer which file you want to edit.
LIST ALL	List the entire file.
LIST n	List one line; substitute the line number for "n".
MODIFY n	Change one line; substitute the line number for "n". Press the space bar to position the cursor directly underneath the character you want to change or before the place you want to insert information. Then, use any of these commands to modify the line: D Delete one character. R Replace one character. I Insert one or more characters.
KEEP	Save the file, with any changes.
EXIT	End the Editor program.

For more information, refer to Chapter Three of the Guide For The New User (Part Number 32033-90009), or consult the EDIT/3000 Reference Manual (Part Number 03000-90012) for help.

Step One: Start The Editor Program

At the colon prompt, type: **EDITOR** Return

The Editor will identify itself, and show you the day, date, and time, like this:

```
:EDITOR
HP32201A.7.16 EDIT/3000 WED, FEB 20, 1985 12:10 PM
(C) HEWLETT-PACKARD CO. 1984
```

(the numbers on your screen will be different)

Then, the Editor's prompt, "/", appears.

Step Two: Identify The Job

At the "/" prompt, type: **ADD** Return

The Editor responds by displaying line number 1 and the blinking cursor, like this:

```
/ADD
    1       _
```

Type: `:JOB MYJOB,OPERATOR.SYS` Return

↑ *(make sure you type in the colon)* ↑ *(the job name)* ↑ *(your computer identity)*

The first line names the job and tells the computer who it belongs to. "MYJOB,OPERATOR.SYS" is this job's identity, just like OPERATOR.SYS is your session identity.

IMPORTANT

If you are required to type in one or more passwords to start a session as OPERATOR.SYS, the passwords must be included in the first line of any job file you create. Type the password next to the appropriate part of the computer identity, separated by a "/". For example, if your user password is "ME" and your account password is "ZEN", the first line should look like this:

:JOB MYJOB,OPERATOR/ME.SYS/ZEN

(user password) ↑ ↑ *(account password)*

Step Three: Type The Commands

When you press Return at the end of the first line, another line number appears. Continue adding the following information to the file, one line at a time.

IMPORTANT

Begin each line by typing the colon prompt. Otherwise, the computer won't know how to interpret your instructions.

Type: :SHOWME Return

and: :SHOWJOB Return

and: :SHOWOUT SP Return

and: :CONTINUE Return

and: :LISTF @.OPERATOR.SYS,2 Return

and: :EOJ Return

Step Four: End The Job File

Finally, tell the Editor that this is the end of the job file.

When line number 8 appears, type: // Return

The Editor's prompt will reappear on the screen.

Step Five: List The Job File

Type: LIST ALL Return

Check what you've typed at the Console and use the MODIFY command to correct any typing mistakes.

Step Six: Keep The Job File

Once you've checked and corrected your file, tell the computer to keep it permanently.

Type: KEEP MYJOB Return
↑ *(or use your own file name)*

Wait a moment for the Editor's prompt to return to the screen. If it doesn't, and instead you're told that "MYJOB ALREADY EXISTS", do the following two things:

- Choose another name for the job file and replace "MYJOB", in the first line, with the new name.
- Keep the file with its new name. For example, if you choose the file name "OPJOB",

  type: KEEP OPJOB Return
  ↑ *(use your own file name)*

Step Seven: Make Your Exit

Type: EXIT Return

```
END OF SUBSYSTEM
:_
↑ (you're talking directly to MPE again)
```

Looking Back: What Have You Got?

You have now created a job. It's also known as a job file because each instruction to the computer is typed into a file and then saved. Let's look at each part.

The first line, below, 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're required to use passwords, they should appear in the first line too.)

```
1  :JOB MYJOB,OPERATOR.SYS
     (the job ↑          ↑ (your computer identity)
      name)
```

If you rename the job file, make sure that you change the job name in line 1 to match the file name.

As you create new versions of MYJOB throughout this Chapter, you'll be reminded to change the job name.

The next series of 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:

2	:SHOWME	"Tell me who I am"
3	:SHOWJOB	"Tell me who else is using the computer"
4	:SHOWOUT SP	"Tell me who else is printing reports"
5	:CONTINUE	"If the next command causes an error, ignore it and go to the next one."
6	:LISTF @.@.OPERATOR,2	"List all the files in my account"
7	:EOJ	"That's the end of this job."

The commands in lines 1 through 6 have something in common: each one, except CONTINUE, report information to you. If you typed these commands at the Console, the information would appear on the Console. But since these commands are lumped together into a job file, the information is collected in a report. When the job is through, you can pick up the report from your printer.

You end a session by typing "BYE". Similarly, you will always end a job by typing "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.

Starting Your Job

To start your job now, type: **STREAM MYJOB** Return

↑ *(use your job file name)*

Because you use the STREAM command to start a job, starting a job is also known as "streaming" a job.

Streaming a job introduces it to the computer, and, in most cases, the job begins immediately. But, 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.

What You'll See If The Computer Accepts Your Job

The first thing you'll see is the number the computer has assigned to your job. (You won't see job results on your screen; they're sent to the printer.) Then, one of two messages appear on the Console. If there are no restrictions on job processing, you'll see a message like this:

```
:STREAM MYJOB (what you typed)

  #Jnn
:
13:49/#Jnn/225/LOGON FOR: MYJOB, OPERATOR.SYS,OPERATOR ON LDEV #10
          ↑ (a number assigned by the computer)
```

If you get a job logon message, skip to "Checking On Your Job With SHOWJOB" on page 3-14.

If for some reason the computer can't begin processing the job right away, you'll see a message like this:

```
:STREAM MYJOB (what you typed)

  #Jnn
:
13:49/#Jnn/225/DEFERRED JOB INTRODUCED ON LDEV #10
          ↑ (the job number assigned by the computer)
```

If you don't get either of the previous messages, skip to "Messages That Alert You To A Problem" on page 3-15.

What To Do If You Get A "DEFERRED JOB" Message

Type: **SHOWJOB, JOB=@J** Return

Count the number of jobs that are executing (listed as "EXEC".) Compare this number to the job limit. If the limit's already been reached, your job won't begin until another ends. And if other jobs besides yours are waiting to be processed, they'll begin first unless they have been intentionally deferred. (This is explained in "Putting Your Job On Hold", below.)

Your best bet is to let the job wait its turn. But, if it's important to start your job now, raise the job limit so that it's equal to the total number of jobs submitted for processing.

Type: **LIMIT nn** Return
↑ *(substitute the total number of jobs for "nn")*

You'll know that resetting the job limit worked if you see a logon message like this within a few seconds:

```
13:58/#Jnn/225/LOGON FOR: MYJOB, OPERATOR.SYS,OPERATOR ON LDEV #10
        ↑ (your job number)
```

If you don't get a logon message, or if the job limit isn't the problem, check the jobfence. If it's equal to or greater than 8, the computer won't process your job until the jobfence is lowered, or your job's "input priority" is raised. (The input priority is a number assigned to every job. Later in this chapter you'll learn how to adjust input priorities and the jobfence to control job processing.)

To lower the jobfence, type: **JOBFENCE n** Return

↑ *(use the number from page 3-2)*

If you've raised the limit and lowered the jobfence, the computer will begin processing your job soon.

Checking On Your Job With SHOWJOB

Use the number that appeared in the job logon message to check on MYJOB.

Type: **SHOWJOB #Jnnn** Return

↑ *(use your job number)*

If your job's already finished, the computer will tell you that there are "NO SUCH JOB(S)". The information that you asked for is printed in a report; go to your printer and pick it up. Otherwise, the computer will list just your job, and no others, like this:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J34    EXEC        105 LP       WED 11:29P  MYJOB,OPERATOR.SYS

 JOBFENCE= 7; JLIMIT= 4; SLIMIT=12
```

(you may see different numbers on your console screen)

Messages That Alert You To A Problem

If you get one of the following three messages, then there's a problem with the job file. To correct the mistake, you'll need to edit the file, save it (purging the old copy), and stream the job again. Use the recap of Editor commands on page 3-5 to help you, or follow the example for editing a job file explained in "Putting Your Job On Hold", below.

The first two message, below, tell you that the first line of your job file doesn't include the correct passwords:

```
14:01/#Jnn/225/MISSING PASS FOR MYJOB,OPERATOR.SYS,OPERATOR ON
   LDEV "10"

14:01/#Jnn/225/INVALID PASS FOR MYJOB,OPERATOR.SYS,OPERATOR ON
   LDEV "10"
```

The next message tells you that you forgot to begin at least the first line of the job file with a colon:

```
WARNING: NO :JOB OR :DATA COMMAND ENCOUNTERED. (CIWARN 1406)
```

Another message you might see can't be corrected by editing the file. If you see the message below, it means you haven't been assigned "BA", or "Batch Access" capability, which permits you to stream jobs:

```
14:01/#J34/225/MISSING BA CAPABILITY FOR "MYJOB,OPERATOR.SYS,
      OPERATOR" ON LDEV "10".
```

If you get this message, check the list of capabilities assigned to OPERATOR.SYS on page 1-2. (If you didn't write them down, read "What Capabilities Is OPERATOR.SYS Assigned?" in Chapter One.) If you aren't assigned BA capability, tell your System Manager and skip to "Controlling All Job Processing" on page 3-42.

If you're used to running programs on the computer, you might have tried to start your job by telling the computer to "RUN MYJOB", like this:

```
:RUN MYJOB (what you typed)
FILE IS NOT A VALID PROGRAM FILE. (CIERR 630)
```

The message above reminds you that programs are "run", but jobs are "streamed". If you see this, go ahead and start the job again using the STREAM command.

This is another message you might see when you stream your job:

```
STREAMS FACILITY NOT ENABLED:  SEE OPERATOR (CIERR 82)
```

Anyone who gets this message when they try to start their job is told to "SEE OPERATOR" because you control the streams facility. If you see this message, or someone else does and tells you about it,

type: **STREAMS 10** Return

Then you (or whoever attempted to stream a job) must stream it again. If you want to know more about the "streams facility" now, keep reading. If not, skip to "What You Get When You Stream A Job" on page 3-18.

The Streams Facility: A Discussion

Since you type the STREAM command at your terminal to start a job, you have every reason to expect that the input device is your terminal. Not so.

When you stream a job, it is submitted to the computer on a special "streams" device. Look at the JIN column in the sample list of jobs below:

```
JOBNUM    STATE    IPRI   JIN    JLIST    INTRODUCED    JOB NAME

#J7       EXEC        8   10S      LP      THU 8:08A     J1.PAYROLL
#J8       EXEC        8   10S      LP      THU 8:10A     MYJOB.SMITH
                          ↑ (the job input device)
```

Type: SHOWJOB JOB=@J Return

If your computer responds with a list of jobs, look at the devices listed in the JIN column. The input device for jobs is always the same: "10S", which is the streams device. (The S stands for "Spooled"; we'll talk about that in the next chapter.)

And now for the tricky part: LDEV 10 doesn't exist as a real physical device, it's a "psuedo device". It's configured to look like a tape drive and is assigned the device class name "JOBTAPE", but if you looked for LDEV 10, you wouldn't find a tape drive. Like any computer device, though, LDEV 10 must be available to users, or "enabled". Otherwise no one, including you, can stream a job.

To prevent users from starting jobs, type: STREAMS OFF Return

To enable the streams facility, type: STREAMS 10 Return

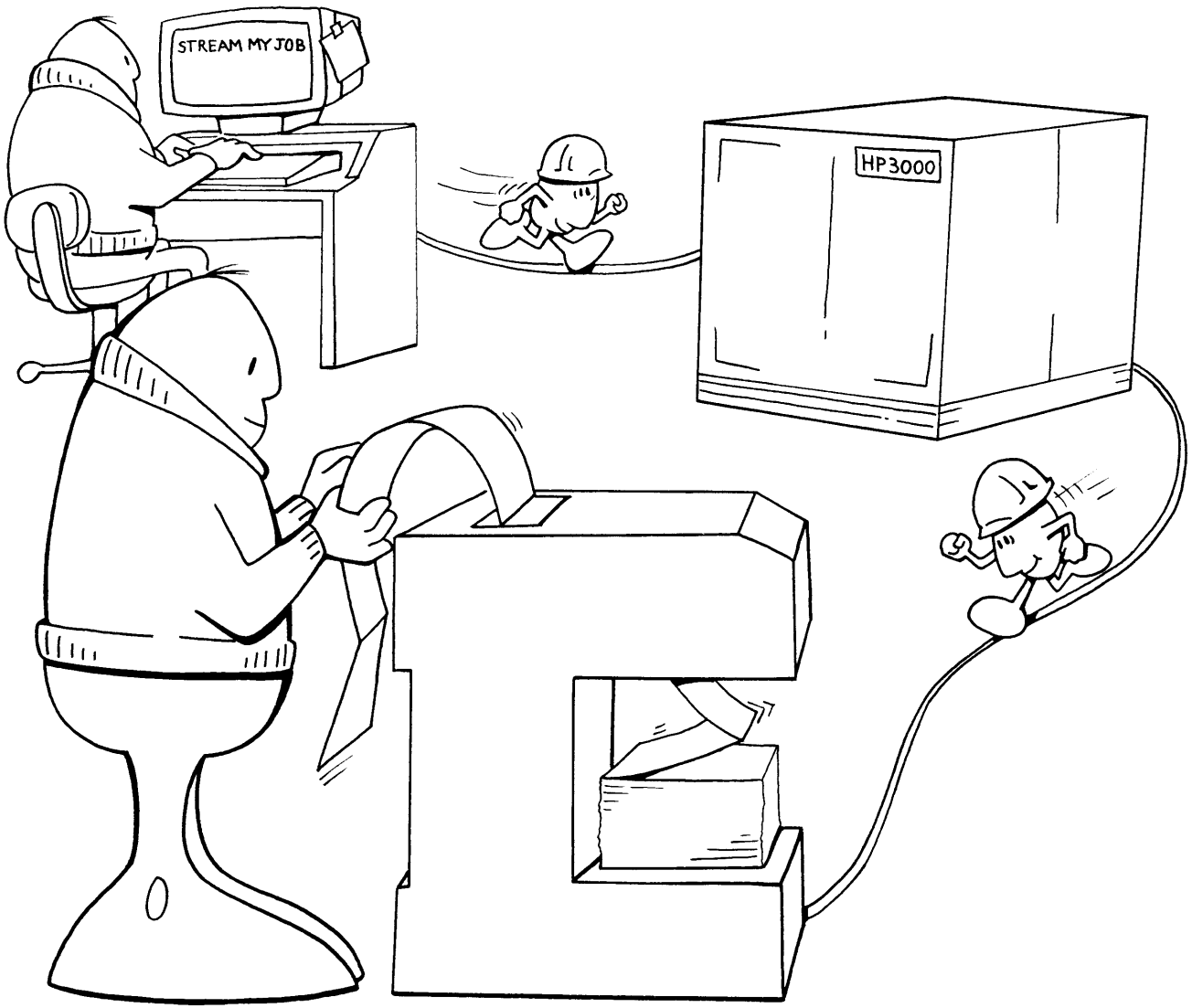
What You Get When You Stream A Job

During a session, you get results from the computer on your screen. When you stream a job, the computer prints the results in a report.

To check, take a look at your computer's list of jobs.

Type: SHOWJOB JOB=@J Return

What appears in the JLIST column? You should recognize the device class name or LDEV number of your printer. If not, check the list of computer devices you've posted near the Console, or look at the printer information you recorded on page 1-2. (If you don't see either, refer to Chapter One.)


STREAM MY JOB
HP3000

When Is The Job Finished?

Until the computer is through processing a job, it will be listed along with any others when you type SHOWJOB. You'll also know when a job ends, because the computer sends a logoff message to the Console:

```
13:50/#J34/225/LOGOFF ON LDEV #10
```

Since MYJOB is a very simple job, you may have already seen the logoff message for it. Most jobs will take longer to process; you may not see the logoff message for several minutes, or several hours.

When Is The Job Report Available?

The results of a job are collected into a file which is then printed. The report may not be immediately available, however, because where and how quickly the results are printed depends on who else is using the printer.

To find out if the report's finished, type: **SHOWOUT SP** Return

The computer may tell you that there are "NO SUCH FILE(S)". If so, then your job's report (and all other reports) have been printed. It's more likely that you'll see a list of reports, like this:

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C

LP       #05875  #S111   $STDLIST OPENED      2048      8   1
LP       #05876  #S12    $STDLIST OPENED      2048      8   1
SERIALP  #05925  #S257   LP       OPENED      2048      8   1
LP       #05635  #J26    $STDLIST READY        100    D 5   1
SERIALP  #05509  #Jnn    $STDLIST READY        172    D 3   1
                           ↑ (your job number)
```

The top part of the screen lists reports that are waiting to be printed. Look for your job number in the third column. If you find it, then your report's still waiting to be printed. If you don't, then it's done, and you can go pick it up.

For more information about the printing process, refer to Chapter Four.

Scheduling Your Job To Start Later

Instead of starting your job now, you can command the computer to begin your job at a specific time, or in a specific number of minutes, hours, or days.

IMPORTANT

Job scheduling is a feature of the more recent versions of the MPE operating system. Check the version number you recorded on page 1-2. If it begins with "G.01", you can schedule jobs on your computer. If not, skip this section and go on to "Putting Your Job On Hold" on page 3-25. (If you didn't write down the number, read "What Version Of The MPE Operating System Is Your Computer Using?" in Chapter One.)

Starting Your Job At A Specific Hour

Assume that it's 9:30 in the morning, and you want the computer to begin your job at 8:00 tonight. One way to do this is to tell the computer to start the job specifically at 8 P.M.

Type: `STREAM MYJOB;AT=20:00` Return

↑ *(note the time)*

You must use a 24-hour clock to tell the computer a specific time to begin the job. For the hours between one P.M. and midnight, you'll 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", since 12 plus 3 is 15.

Use the number assigned to your job to verify that the job is scheduled to begin at the correct time:

Type: SHOW JOB #Jnnn Return
↑ *(use the job number from your screen)*

Or type: SHOW JOB SCHED Return

The computer will describe your job, and others that are scheduled. Check the date and time in the "SCHEDULED-INTRO" column. It should say "20:00", like this:

```
CURRENT:  3/ 4/85 9:35

JOBNUM  STATE IPRI JIN  JLIST    SCHEDULED-INTRO  JOB NAME

#J13    SCHED    8  105 LP        3/ 4/85  20:00  MYJOB.OPERATOR.SYS
```

Before continuing, get rid of this scheduled job. Using the job number it was assigned by the computer,

type: ABORT JOB #Jnnn Return
↑ *(use the number from your screen)*

IMPORTANT

When you abort a job, you don't destroy the job file. You're just telling the computer not to process it now. Later, you can stream the job again —without recreating the job file.

Starting Your Job 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 10½ hours. (If it's 9:30 in the morning, 8 p.m. is 10½ hours from now.) Try it.

Type: `STREAM MYJOB;IN=,10,30` Return
("10 hours, 30 minutes from now") ↑

IMPORTANT

Commas are used as placeholders. In the command above, you started the job 0 days from now. So, you could have expressed 10 1/2 hours from now as "0,10,30", or "0 days, 10 hours, and 30 minutes" from now. Or, for example, to schedule the job for just 30 minutes from now, you could type the time as ",,30" or "0,0,30".

If you mistype the time, the computer will respond with this error message:

```
EXPECTED A POSITIVE NUMBER SPECIFYING THE DAY OFFSET. (CIERR 6341)
```

Don't worry, just type the command again.

If you have scheduled the job correctly, the computer assigns it a job number. Use the job number to check on it:

Type: `SHOWJOB #Jnnn` Return
↑ (use the number from your screen)

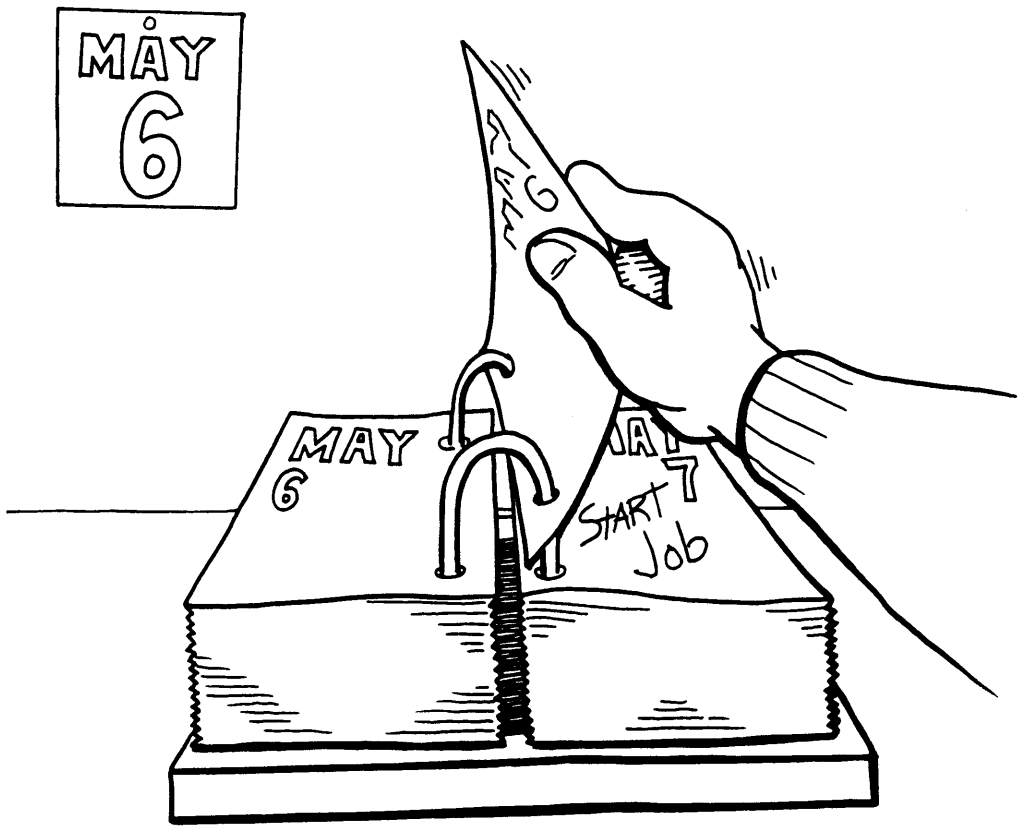
Or, you can check on all scheduled jobs:

Type: `SHOWJOB SCHED` Return

Before continuing, get rid of this scheduled job using the job number the computer assigned it:

Type: A B Ø R T J Ø B _ # J n n n Return
↑ *(use the number from your screen)*

Suppose it is still 9:30 in the morning (you're getting an awful lot done in no time!) and you want start the job at 8:00 tomorrow night.



Tell the computer to begin the job in one day, 10 hours, and 30 minutes.

Type: `STREAM MYJOB;IN=1,10,30` Return

↑ *("1 day, 10 hours, and 30 minutes from now")*

Use the number the computer assigns to your job to check on it.

Type: `SHOWJOB #Jnnn` Return

↑ *(use the number from your screen)*

Again, look at the information in the SCHEDULED-INTRO column, but this time, notice the date. The job should be scheduled to begin at about the same time as the others, but one day from now.

Before continuing, get rid of this last scheduled job. Using the job number from your screen,

type: `ABORTJOB #Jnnn` Return

↑ *(use the number from your screen)*

Putting Your Job on Hold

By modifying the first line of MYJOB, you can change how the computer processes it.

The first change you'll make puts a hold on MYJOB when you tell the computer to process it. In the next section, you'll edit the original file again to illustrate other ways to control your own job. Each time you edit MYJOB, you're instructed to save it under a new name. By the end of the chapter, you will have several variations of the original job file.

IMPORTANT

This example gives you explicit instructions for editing a job file. Later, when you read "Other Ways To Control Your Own Job", you may refer back to Steps One through Six to remind you of the editing process, or use the recap of Editor commands on page 3-5.

Step One: Start The Editor

At the colon prompt, type: EDITOR Return

Wait a few moments for the Editor program to identify itself and display the special prompt, "/".

```
:EDITOR (what you typed)
HP32201A.7.16 EDIT/3000 MON, FEB 25, 1985, 2:14 PM
(C) HEWLETT-PACKARD CO. 1984          ↑ (the date and time
/_                                      will be different)
 ↑ (the Editor is waiting for your command)
```

Step Two: Choose A File To Edit

To begin, tell the Editor which file you want to work on. Since you'll use the TEXT command (followed by your file name) this is called "texting in" your job file.

IMPORTANT

To edit the job file, you must have created it to begin with. IF YOU DIDN'T, end the Editor program by typing: EXIT Return. When the colon prompt is reprinted on your screen, go back to page 3-4 and follow the directions for "Creating A Job".

To "text in" MYJOB, type: **TEXT MYJOB** Return

↑ *(or use the file name you chose)*

If the computer tells you that you just typed an "UNKNOWN COMMAND NAME", look at the prompt on your screen. If it's a colon, go back to Step One and restart the Editor.

If you mistyped the file name, or didn't create the job file earlier, the Editor displays this error message:

```
+-F-I-L-E---I-N-F-O-R-M-A-T-I-O-N---D-I-S-P-L-A-Y+
!  ERROR NUMBER: 52       RESIDUE: 0              !
!  BLOCK NUMBER: 0        NUMREC: 0               !
+--------------------------------------------------+
*23*FAILURE TO OPEN TEXT FILE    (52)
NONEXISTENT PERMANENT FILE  (FSERR 52)
/_
```

Repeat the TEXT command; type: **TEXT MYJOB** Return

↑ *(or use the file name you chose)*

If the error message isn't repeated, go on to Step Three. If it is,

type: **EXIT** Return

You'll see the message "END OF SUBSYSTEM" and a colon prompt. At this point, check to see if your job file is listed with your other permanent files:

Type: **LISTF** Return

When the computer lists all your files, look for the name of your job file. If it's not there, you need to create the file again. Go back to page 3-4 and follow the directions for "Creating A Job".

Step Three: Modify The First Line

Tell the Editor you want to change the first line.

Type: **M O D I F Y ␣ 1** Return

If you didn't identify the file you want to edit, the Editor responds "*40*UNDEFINED TEXT". Go back to Step Two, and then use the MODIFY command to edit the first line.

If you identified the file, the Editor displays the first line and waits for your corrections:

```
/MODIFY 1 (what you typed)
MODIFY      1
:JOB MYJOB,OPERATOR.SYS
_
```

Using the space bar, move the cursor to the end of the line.

Then type: **I ; I N P R I = 1** Return

The Editor automatically displays the modified line:

```
:JOB MYJOB,OPERATOR.SYS;INPRI=1
_                              ↑ (adding this puts the job
                                 on hold when you start it)
```

If you still see the cursor, and no prompt, you can add or change something else in the same line. If you've pressed [Return], and the Editor prompt is displayed, repeat the MODIFY command. There's one more change you must make to line one.

Since you're creating a new version of MYJOB, which you'll keep along with the original file, change the job name in the first line. Using the space bar, move the cursor underneath the comma.

Then type: **I 1** [Return]

```
:JOB MYJOB,OPERATOR.SYS;INPRI=1
          I1 (what you typed)
:JOB MYJOB1,OPERATOR.SYS;INPRI=1
       ↑ (the new job name)
_
```

When you're satisfied that the line is correct, press [Return]. This tells the Editor that you're through editing that line. In response, it prints the "/" prompt on the screen, awaiting your next command.

Step Four: Keep The Job File

Since you're through editing the file, use the KEEP command to save the job file with its new name, "MYJOB1".

Type: **KEEP MYJOB1** [Return]
↑ *(or use the file name you chose)*

If the Editor prompt returns to the screen, you've successfully created a new file. If you already have a file named MYJOB1, the Editor asks this question:

```
/KEEP MYJOB1 (what you typed)
MYJOB1 ALREADY EXISTS - RESPOND YES TO PURGE OLD AND KEEP NEW
"PURGE OLD?"_
```

If you answer "YES", you'll destroy a file that already exists. Go ahead if you know what's in the file and it's okay to get rid of it. Otherwise, choose another name for the job file and repeat Step Three to change the job name in the first line, and Step Four to keep the file.

Step Five: Make Your Exit

After you keep the file, type: **EXIT** Return

```
/EXIT (what you typed)
END OF SUBSYSTEM
:_
↑ (you're talking directly to MPE again)
```

Step Six: List Your Job Files

You now have two job files, MYJOB and MYJOB1 (unless you chose other names for them). To list them, and any other files that begin with the letters MYJOB,

type: **LISTF MYJOB@** Return

↑ *(or use your file name followed by "@")*

The computer displays any of your files that begin with "MYJOB", like this:

```
MYJOB     MYJOB1
```

Start Your Job

Type: **STREAM MYJOB1** Return

The computer should respond by displaying the number it assigns the job. (If you get another message, refer to "Messages That Alert You To A Problem" on page 3-15.) You can check on your job in one of two ways.

Type: **SHOWJOB JOB=OPERATOR.SYS** Return

Two "jobs" will be listed: MYJOB1 and your session on the Console. That's because the computer uses the term "job" to describe both jobs and sessions.

Or type: **SHOWJOB #Jnnn** Return

(use the job number assigned by the computer)

You'll see just your job displayed in this form:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#Jnnn   WAIT  D 1   10S LP       WED 12:18P  MYJOB1,OPERATOR.SYS
```

(the job number assigned by the computer)

(this stands for "deferred")

By adding "INPRI=1" to the first line of the job file, you changed its input priority to the lowest possible value. This defers the job, putting it in a "WAIT" state. (See for yourself: look at both the STATE and IPRI columns on your screen.) You'll learn more about using input priorities when you read "Using Input Priorities And The Jobfence To Control Job Processing" on page 3-45.

Other Ways to Control Your Own Job

By making simple changes to line 1 of MYJOB, you can control how the computer processes it in these ways:

- Make your job a high priority task so that the computer processes it quickly.
- Ensure that your job will be automatically restarted if it's interrupted by a system shutdown or failure.
- Print the results of your job on a different printer.
- Print multiple copies of the results.

The Method: Editing Line One Of The Job File

In the next four examples, you will modify the first line of your original job file, MYJOB. In each case, you'll add information which specifically directs the computer to process the job in a different way. You'll also change the job name, and then keep the file using the new name. By the end of this section, you will have six job files: the original file, MYJOB, the one you've already created, MYJOB1, and four additional variations, MYJOB2, MYJOB3, MYJOB4, and MYJOB5.

IMPORTANT

If you have chosen a name other than MYJOB for your original job file, continue using it as the root file name when you edit line 1 in the next few pages. For example, if you're using OPJOB instead of MYJOB, name the next four files OPJOB2, OPJOB3, OPJOB4, and OPJOB5.

Before beginning, find out how many variations of the basic file MYJOB you have:

Type: LISTF MYJOB@ Return
↑ *(or substitute your own file name)*

If you've tried the examples in this chapter, the computer will most likely tell you that you have two variations of the file MYJOB:

```
MYJOB      MYJOB1
```

If the computer tells you that there are "NO SUCH FILE(S)", check to make sure you asked it to list your original job file. If you did, and you typed everything correctly, list all your files:

Type: LISTF Return

If you still don't see your original job file listed, you must re-create it to complete the next four examples. To do so, refer to "Creating A Job" on page 3-4.

In the next four examples you'll follow these basic steps to create a new version of MYJOB:

1. Start the Editor program by typing: EDITOR [Return]
2. Text in the original job file by typing: TEXT MYJOB [Return]
   (or use your job file name) ↑
3. Modify the first line by typing: MODIFY 1 [Return]
4. Edit the line, remembering to change the job name.
5. Keep a new version of the file by typing: KEEP *(file name)* [Return]
6. End the Editor program by typing: EXIT [Return]

Making Sure Your Job Has High Priority

If your job is critical, you can ensure that the computer processes it quickly by adding "HIPRI" to the first line of the job file. To do so, you must be assigned OP capability. Check the capabilities listed for OPERATOR.SYS on page 1-2; if it doesn't include OP capability, go on to "Restarting Your Job Automatically".

Using the Editor, modify the original job file MYJOB so that the first line reads:

:JOB MYJOB2,OPERATOR.SYS;HIPRI
↑ *(the new job name)* ↑ *(this means "high priority")*

Keep the file, naming it "MYJOB2".

Type: STREAM MYJOB2 [Return]

The computer responds by displaying the job number.

In most cases, the computer will process MYJOB2 so quickly that you probably won't have time to check on it. But, if the job limit's been reached, you'll see something like this:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J9     EXEC        105 LP       WED 11:29P  MAILMAN.HPOFFICE
#J11    EXEC        105 LP       WED 11:29P  MTRUCK.HPOFFICE
#J87    WAIT:1  HI  105 LP       WED 12:18P  MYJOB2,OPERATOR.SYS
          ↑ (yours will be the first waiting job
            that the computer processes)
```

Before continuing, count how many variations of the original job file you've created.

Type: LISTF MYJOB@ Return
↑ *(or use your job file name)*

The computer will list whatever files match the description. How many files you have depends on whether you're reading through the examples, or trying them out.

Restart Your Job Automatically

When the computer fails or is shut down, all jobs are stopped. You can ensure that your job is automatically restarted when you restart the computer by adding "RESTART" to the first line of the job file.

IMPORTANT

There are five different ways to restart your computer system, as Chapter Eight explains. The computer will only automatically restart your job when one of these, the "warmstart" option, is used.

Use the Editor to modify the first line of the original job file. Change the job name and add ";RESTART" to line 1 so that it looks like this:

```
:JOB MYJOB3,OPERATOR.SYS;RESTART
      ↑ (the new job name)        ↑ (this tells the computer
                                    to restart the job)
```

Keep the file, using the name "MYJOB3", and end the Editor program. When you stream this variation of the job, you won't see anything to indicate that it will restart automatically.

If you've been trying each example, you should now have four job files: the original, MYJOB, and three variations. To check,

type: LISTF MYJOB@ Return
↑ *(or use your original job file name)*

Your list of job files should look something like this:

```
MYJOB     MYJOB1     MYJOB2     MYJOB3
```

If the computer responds with an error message instead, ask for a list of all your files and look for your job files among them.

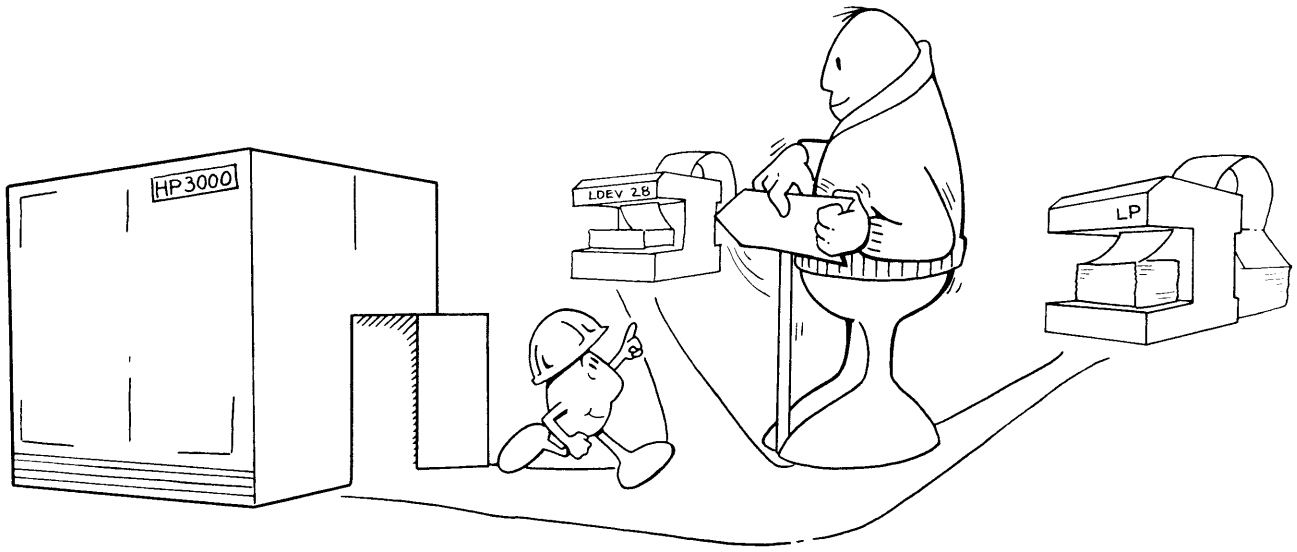
Type: LISTF Return

Sending The Results To Another Printer

LP, a common device class name for line printers, appears in the JLIST column in most of the examples you've been shown. Your computer may also be set up to automatically print job reports on LP. Suppose, though that your computer has two printers, and you want to print the report on the other one. If you know the LDEV number of the alternate printer, it's easy.

Use the Editor to modify the first line of the original job file so that it looks like this:

```
:JOB MYJOB4,OPERATOR.SYS;OUTCLASS=nn
        ↑ (the new job name)      (you printer's LDEV number) ↑
```



Keep the file with the new name "MYJOB4", then end the Editor program.

At the colon prompt, type: **STREAM MYJOB4** Return

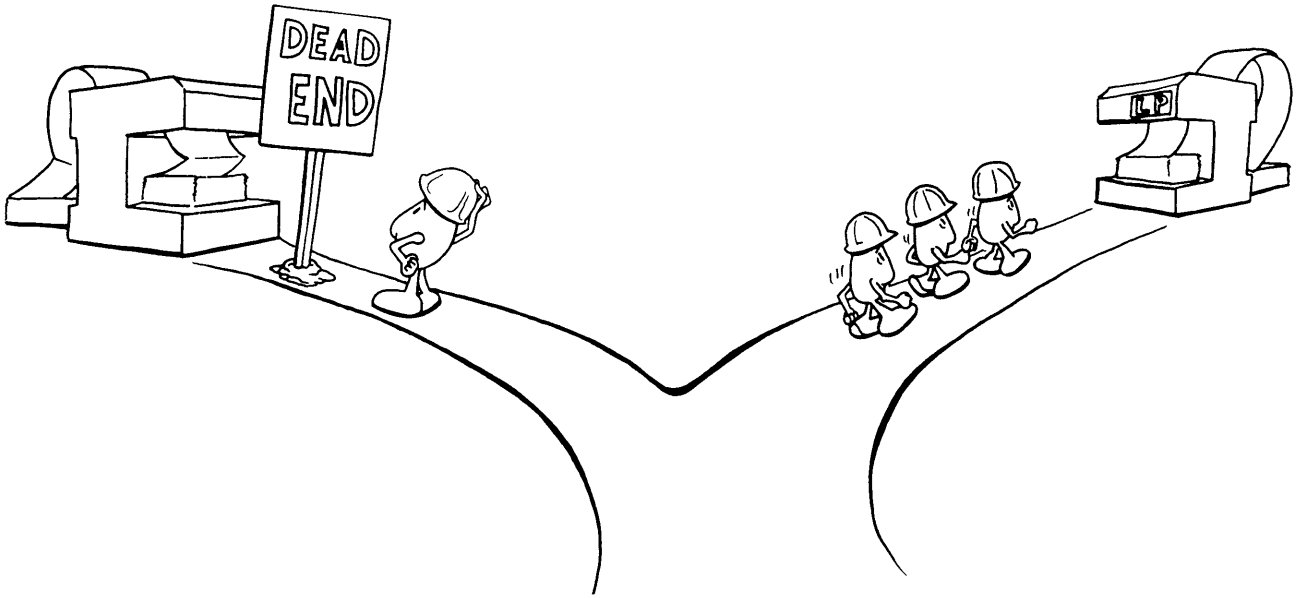
To check on it, type: **SHOWJOB #Jnnn** Return
(use your job number) ↑

Look at the JLIST column on your screen to see if the LDEV number of your second printer is listed for MYJOB4.

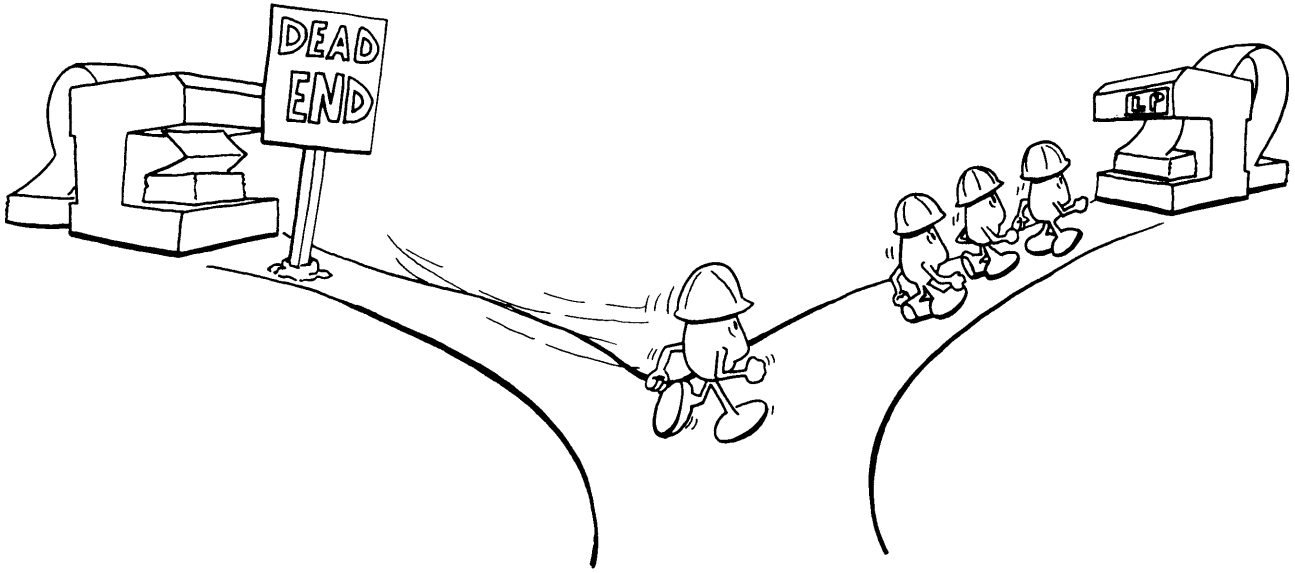
```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J9     EXEC        105 LP       WED 11:29P  MAILMAN.HPOFFICE
#J11    EXEC        105 LP       WED 11:29P  MTRUCK.HPOFFICE
#J67    EXEC        105 nn       WED 12:45P  MYJOB4,OPERATOR.SYS
                        ↑ (the alternate printer's LDEV number)
```

If you typed the wrong LDEV number in the first line of the job file, you'll see this message:

```
 INVALID OUTCLASS DEVICE TYPE, DEFAULT USED. (CIWARN 1478)
  #Jnnn
:_
```



The computer still accepts the job and assigns it a number. Since it can't follow your directions, though, it sends the report to the "default" printer, which is where job results normally are printed.



Printing Multiple Copies Of A Report

You can easily print up to eight copies of the report you normally receive. For example, to print 4 copies of the results from MYJOB, edit the first line of the job file so that it looks like this:

```
:JOB MYJOB5,OPERATOR.SYS;OUTCLASS=,,4
        ↑ (the new job name)      (print 4 copies of the report) ↑
```

IMPORTANT

Since you also use "OUTCLASS=" to switch printers (look back at the preceding example), you need the commas in this example as placeholders. This way, the computer will understand that you want 4 copies of the job report, and not that you want the report printed on LDEV 4.

Keep the new version, naming it "MYJOB5", and end the Editor program.

At the colon prompt, type: STREAM MYJOB5 Return

To check it, type: SHOWJOB #Jnnn Return
(use the job number from your screen) ↑

When the computer is through processing the job, it will create four copies of the job results. You can check this in one of two ways:

- If the printer isn't busy, the job results are probably ready and waiting for you. Go to the printer and pick them up.
- If your printer is used a lot, your job results may still be waiting. To check,

  type: SHOWOUT SP Return

  Look for your job number in the third column. If you find it, the results haven't been printed yet. The last column, though, tells you how many copies will be printed.

When you streamed MYJOB5, did you get one of these error messages?

```
UNKNOWN KEYWORD. EXPECTED ONE OF TERM, PRI, INPRI, HIPRI
   OUTCLASS, RESTART. (CIWARN 1452)
```

Or:

```
INVALID OUTCLASS DEVICE TYPE, DEFAULT USED. (CIWARN 1478)
```

Or:

```
FIRST CHARACTER IN NAME NOT ALPHABETIC. (CIERR 1434)
```

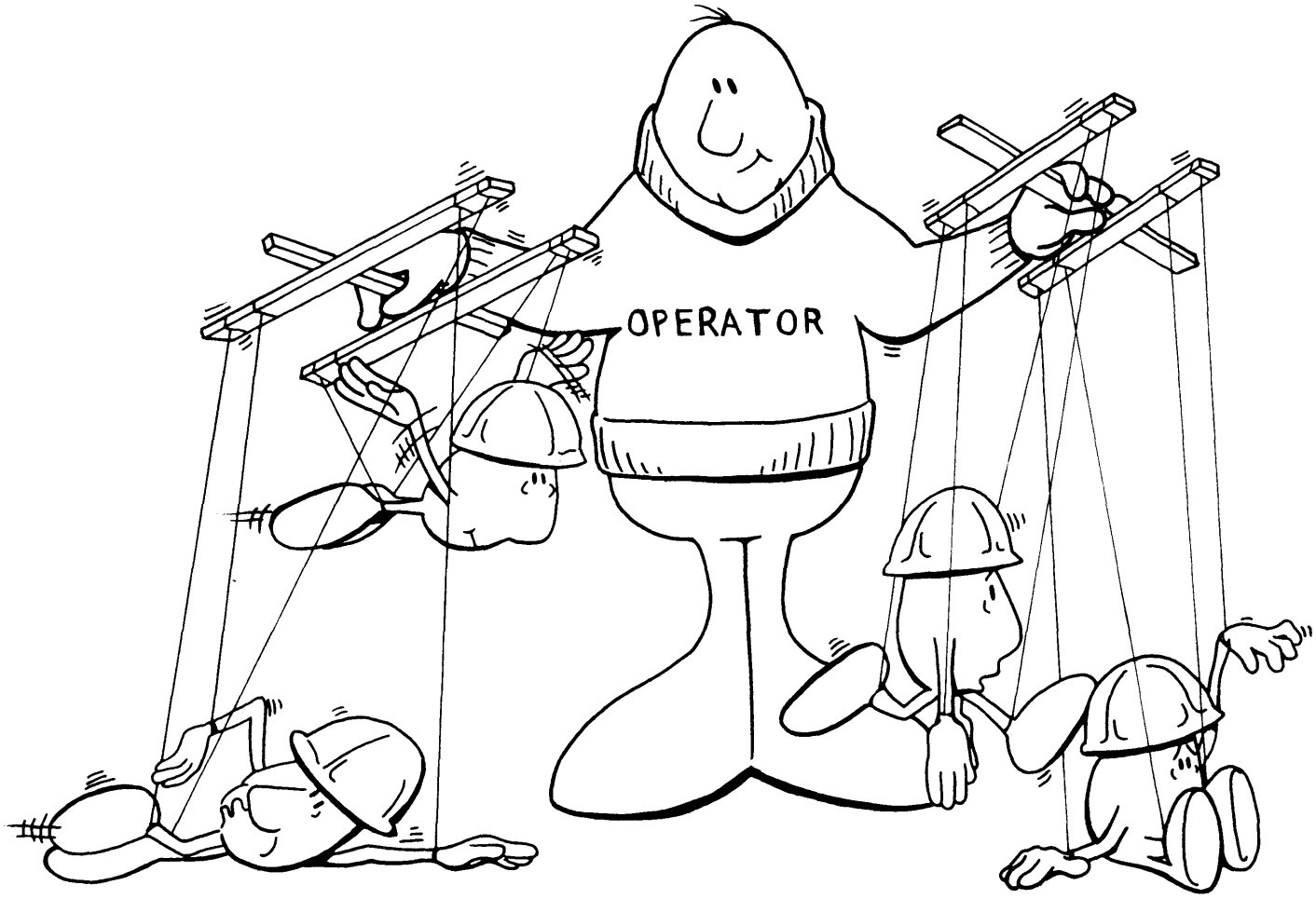
If you did, just use the Editor to correct the first line of your job file so that it exactly matches the example on page 3-41. When it looks okay, save the file (purging the old copy of the same name), exit from the Editor, and start the job again.

Controlling All Job Processing

Users control the jobs they create. But only the System Operator can control all job processing for the entire computer system. From the Console, you can make the following system-wide changes that affect everyone:

- Limit the number of jobs that the computer processes at one time.
- Prevent the computer from processing any new jobs.
- Suspend any job.
- Stop, or abort, any job.

You can also modify jobs that are on hold or scheduled in the same ways that you manipulated MYJOB. But, instead of editing the job file, you'll use the ALTJOB command to alter how the job is processed after the job has been streamed.



Resetting The Job Limit

You can set a limit on the number of jobs the computer processes in the same way that you limited sessions. Most of the time, you'll lower the limit to 0 or leave it alone. Lowering the limit won't affect jobs that the computer is processing already. It only affects those that are streamed after you lower the limit.

To lower the job limit, type: **LIMIT 0** Return

IMPORTANT

You use the same command to limit both jobs and sessions. The first number always specifies the job limit, 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.

To check the new limit, type: **SHOWJOB STATUS** Return

You should see "JLIMIT= 0". If you don't, repeat the LIMIT command. When the limit's been lowered to 0, start MYJOB again:

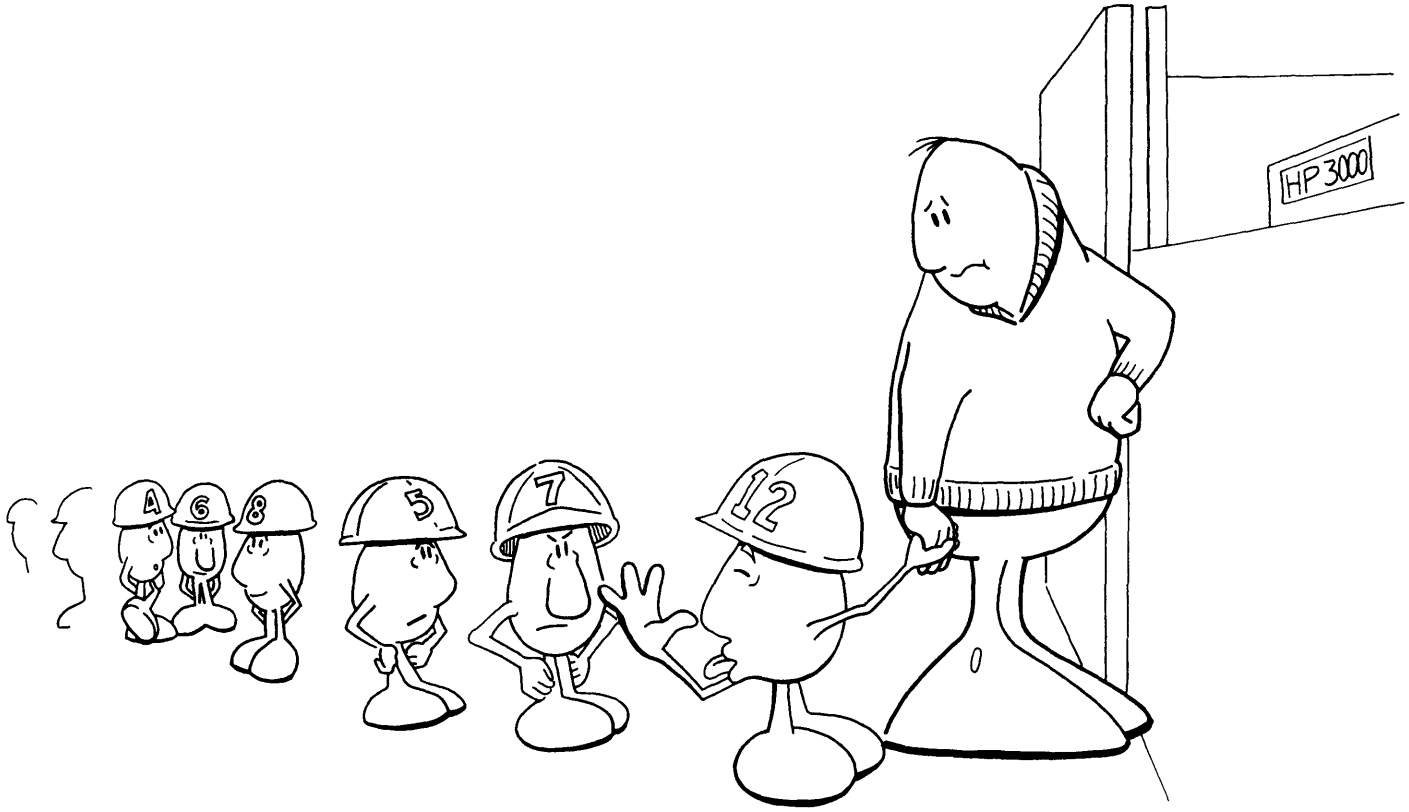
Type: **STREAM MYJOB** Return

At the colon prompt, type: **SHOWJOB JOB=@J** Return

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J9     EXEC       105 LP       WED 11:29P  MAILMAN.HPOFFICE
#J11    EXEC       105 LP       WED 11:29P  MTRUCK.HPOFFICE
#J24    WAIT:1     105 LP       WED 12:45P  MYJOB,OPERATOR.SYS
```

"WAIT:1" in the example above, and on your screen, means that MYJOB is first in line for computer processing. As others stream jobs, the computer will

keep track of them. The next job someone streams will be listed as "WAIT:2", the third as "WAIT:3", and so on, unless someone starts a high priority job. In that case, the job with high priority will move to the head of the line.

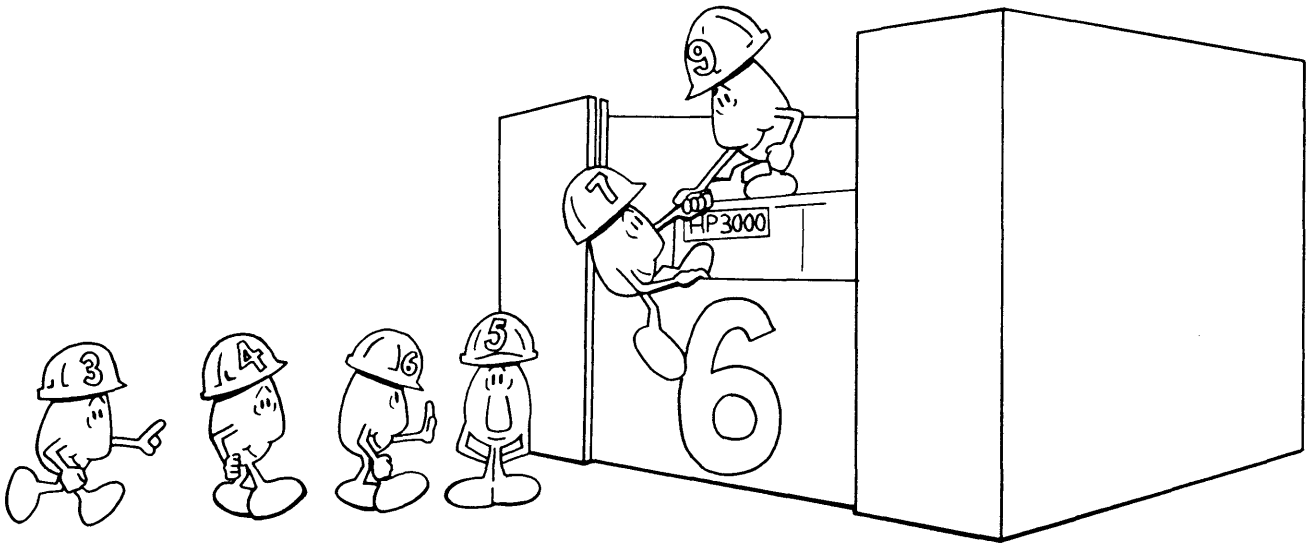


Before continuing, reset the limit by typing: **LIMIT n** Return

↑ *(use the number from page 3-2)*

Using Input Priorities and the Jobfence to Control Job Processing

Two factors control which jobs are processed by the computer: a job's "input priority" and the "jobfence". The computer uses each job's input priority to determine the order in which they're processed. For example, a job assigned an input priority of 9 will be started before one with an input priority of 7.



Jobs assume a "default" input priority of 8. The input priority can be changed in two ways:

- The person who created the job can assign it an input priority between 1 and 13 by adding "INPRI=nn" to the first line of the job file. Users with OP or SM capability can specify the highest priority, 14, or add "HIPRI" to the first line of their job files.
- If a job is waiting or scheduled to begin, you can reset its priority. To ensure it's processed quickly, raise the priority to 13 (or 14, if you're assigned OP capability). To put the job on hold, lower its priority to 0 or a number less than the jobfence.

The second way you can control job processing is to reset the jobfence.

What's The Jobfence?

The jobfence is exactly what it sounds like: it's a barrier that keeps some jobs from being processed. You set the jobfence to any value between 0 and 14. To be eligible for computer processing, a job's input priority must exceed the jobfence.

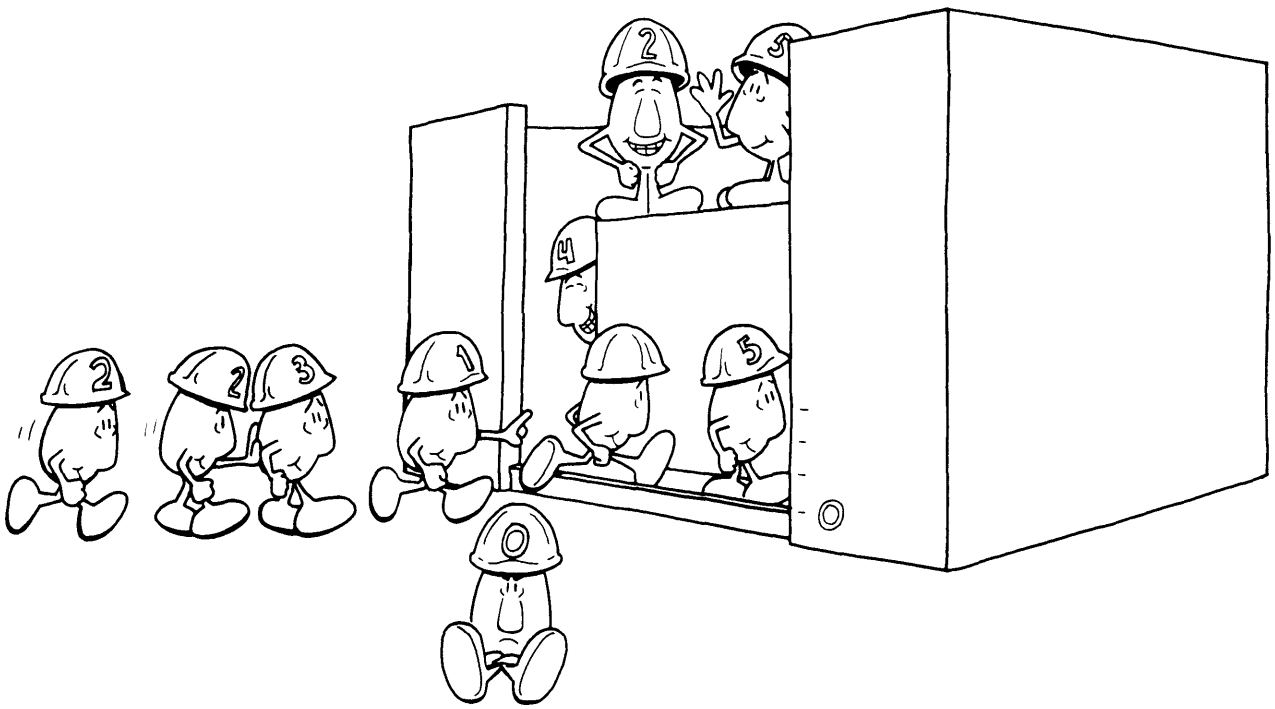
Making More Jobs Eligible For Processing

To make more jobs eligible for computer processing, lower the jobfence.

To lower the jobfence to 0, type: **JOBFENCE 0** Return

When the colon prompt reappears, type: **SHOWJOB STATUS** Return

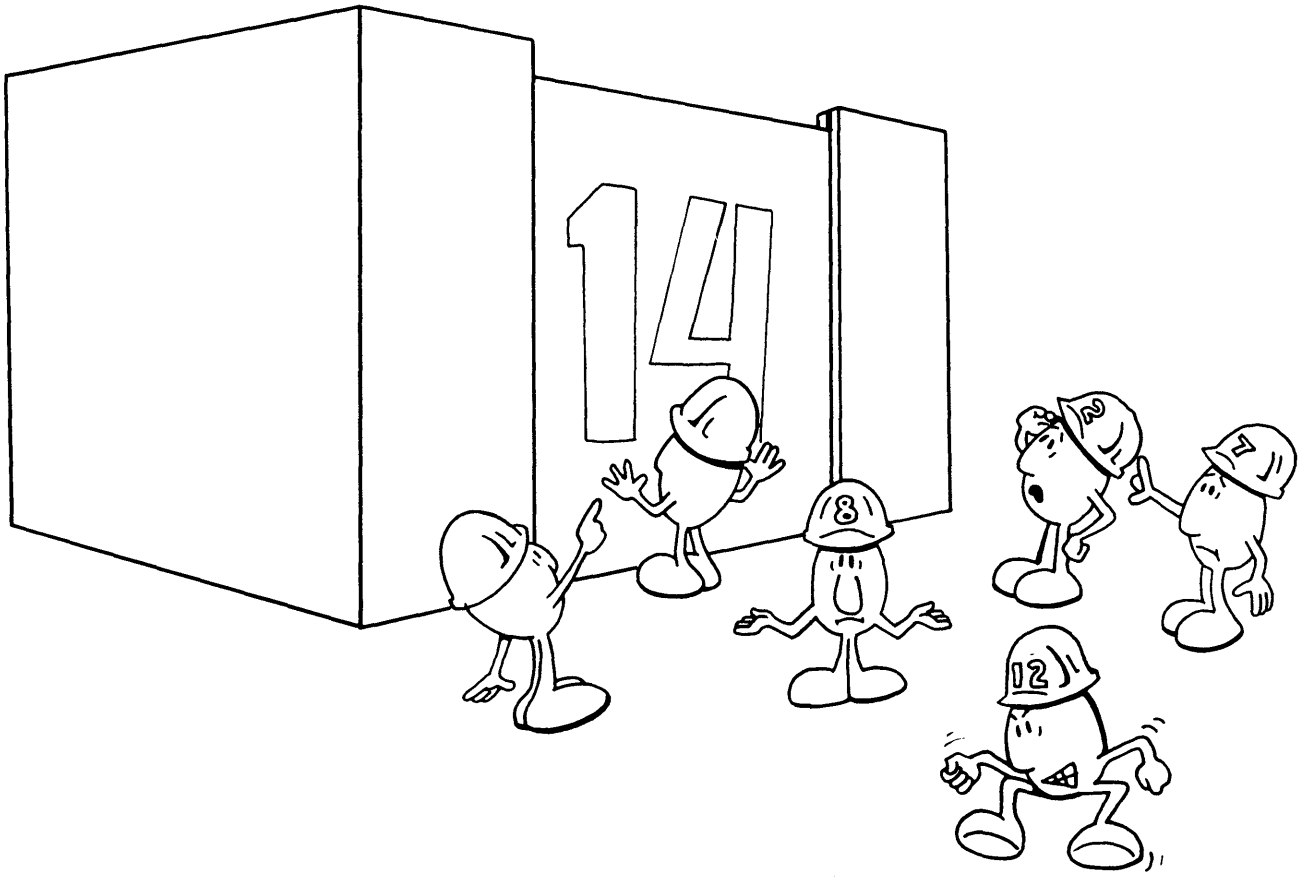
You should see "JOBFENCE=0" on your Console. It means that all jobs with an input priority of 1 or more will be eligible for computer processing.



Jobs assigned an input priority of 0 remain deferred until you raise their input priority. That's because a job's input priority must exceed the jobfence, which can only be lowered to 0.

Placing A Hold On New Job Processing

One way to limit the number of jobs the computer processes is to set the jobfence high. This won't affect executing jobs, but jobs that are waiting or scheduled to begin, or jobs that are streamed after the jobfence is raised, will be deferred.



Type: JOBFENCE 14 Return

Type: SHOWJOB, JOB=@J Return

Check the last line displayed on your Console. What's the jobfence now?

Jobs can still be streamed when the jobfence is 14, but they won't begin executing. Instead, the computer will let you know that a "DEFERRED JOB" has been "INTRODUCED".

To see for yourself, type: STREAM MYJOB Return
(or your job file name) ↑

Since it's your job, and the Console is the terminal you're using the computer displays the job number on the Console. It also sends a message to the Console, which is where all job-related messages appear, telling you that a job has been introduced:

```
:STREAM MYJOB (what you typed)
  #Jnnn
17:09/#Jnnn/26/DEFERRED JOB INTRODUCED ON LDEV #10

                    (the job numbers should match)
```

Using the number that the computer assigned your job,

type: SHOWJOB #Jnnn Return
↑ *(the number on your screen)*

The computer will describe it something like the next example.

The job and session limits may be different, but the Console should show that the jobfence is 14 as it does below:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J62    WAIT    D   10S   LP     MON  3:29P  MYJOB,OPERATOR.SYS

JOBFENCE= 14; JLIMIT= 3; SLIMIT= 12
```

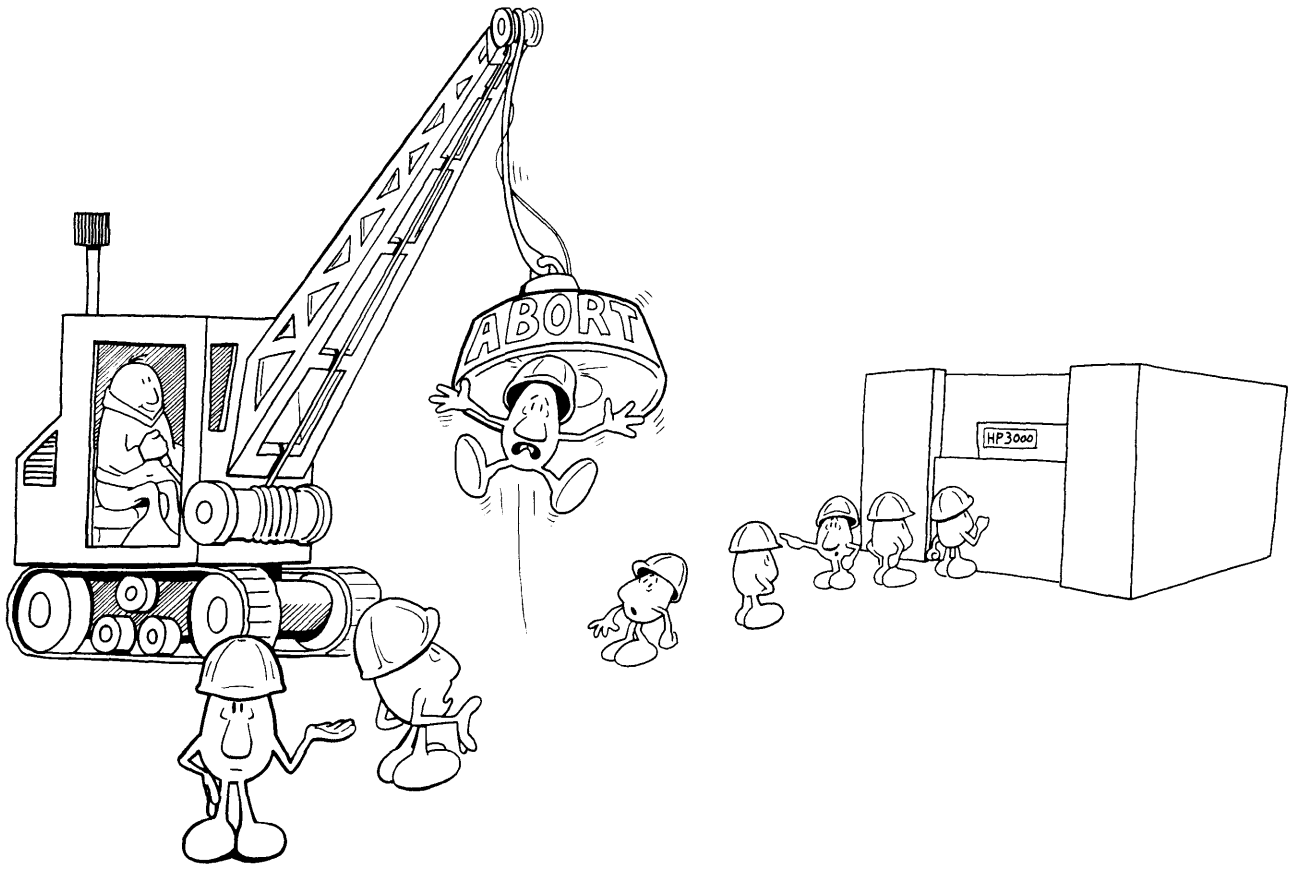
The STATE column reports the status of your job. In this case, MYJOB will wait to begin executing until the jobfence is lowered. That's why it's listed as WAIT, with a "D" (which stands for "Deferred") in the IPRI column.

IMPORTANT

Is MYJOB listed as "WAIT:1" instead? That means that the job limit has already been reached, and before your job can begin, another must finish and log off.

Deferred jobs will continue to wait until their priority is raised or the jobfence is lowered, which allows them to log on and begin executing.

Or, you can "abort" a job, which deletes it from the list. This won't destroy the job file, it just cancels your command to process the job.



Before continuing, get rid of MYJOB and reset the jobfence.

Type: ABORTJOB #Jnnn [Return]
↑ *(use the number that the computer assigned MYJOB a minute ago)*

Type: JOBFENCE nn [Return]
↑ *(use your original jobfence; check page 3-2 for the number)*

Which Jobs Can You Control?

As the System Operator, you can give the computer new instructions for processing waiting and scheduled jobs.

To list waiting jobs, type: SHOWJOB WAIT [Return]

Your computer will either tell you that there are "NO SUCH JOB(S)", or it will list them for you. Any of the jobs it lists are the jobs you can control.

To list scheduled jobs, type: SHOWJOB SCHED [Return]

Again, you may either see a list of jobs, or you may find out that none are scheduled. But, if you're using an early version of MPE, you probably got this message instead:

```
EXPECTED ONE OF JOB, SUSP, INTRO, WAIT, EXEC, OR STATUS.
  (CIERR 1511)
```

It means that jobs scheduling isn't a feature of your computer system. In this case, you'll only be able to control jobs that are waiting to begin.

You can change how the computer processes waiting and scheduled jobs in these ways:

- Print a job's report on another printer.
- Keep the computer from processing a job until you say so.
- Change the order in which jobs will be processed.

Giving The Computer New Job Processing Instructions

Type: **SHOWJOB WAIT** Return

If your computer lists at least one job that's waiting, skip to the next page and use it in the next examples. If not, find out if you still have MYJOB1 among your files. (MYJOB1 is the first variation of the original job file that you created when you learned how to put a job on hold. When you started it, it remained deferred because you added "INPRI=1" to the first line of the file.)

Type: **LISTF MYJOB1** Return

If the computer finds "NO SUCH FILE(S)", go back to "Putting Your Job On Hold" on page 3-25 and create a new version of the job file that you can use in the next examples. If the computer does list MYJOB1,

type: **STREAM MYJOB1**

```
:STREAM MYJOB1 (what you typed)
  #Jnnn
17:23/#Jnnn/47/DEFERRED JOB INTRODUCED ON LDEV #10
```

You now have a waiting job to experiment with in the following examples. Substitute the number that appears on your screen for "nnn" in the following commands.

Sending A Job Report To A Different Printer

Type: `SHOWJOB #Jnnn` Return
(use your job number)

Look at the JLIST column. It tells you the device class name or LDEV number of the printer that will print the job results. If a second printer is connected to your computer and you know its LDEV number, you can send the results to that one instead. To do so,

type: `ALTJOB #Jnnn;OUTDEV=nn` Return
(use your job number) *(use the LDEV number of the alternate printer)*

IMPORTANT

The JOB command, which you used to create the original job file, uses the term "OUTCLASS" to specify where the report will be printed. The ALTJOB command uses the term "OUTDEV" to do the same thing.

If you make a typing mistake, you'll probably see this:

```
ALTJOB EXPECTS AT LEAST JOB NUMBER AND ONE OF EITHER INPRI
   OR OUTDEV.  (CIERR 3089)
```

Don't worry, just try the command again.

If the computer accepts your command, it reprints the colon prompt on the screen with no message. To check on the job,

type: `SHOWJOB #Jnnn` Return
(use your job number)

The LDEV number of your alternate printer should show up in the JLIST column.

You can also tell the computer to print the job results on any printer assigned a specific device class name. For example, to send the job results to a printer named "LP",

type: ALTJOB #Jnnn;OUTDEV=LP Return
↑ *(use your job number)*

If you mistype the device class name, or you don't have a printer assigned the device class name you used, the computer responds this way:

```
:ALTJOB #Jnnn;OUTDEV=LP (what you typed)
 DEVICE  OR DEVICE CLASS DOES NOT EXIST IN THIS CONFIGURATION
    (CIERR 3090)
```

Check the LDEV numbers and device class names of your printer. You'll find them either on the printer itself, written on page 1-2, or listed with other computer equipment in your device list. If you can't find the information at all, refer to "Controlling Computer Devices From The Console" in Chapter One.

Changing A Job's Priority

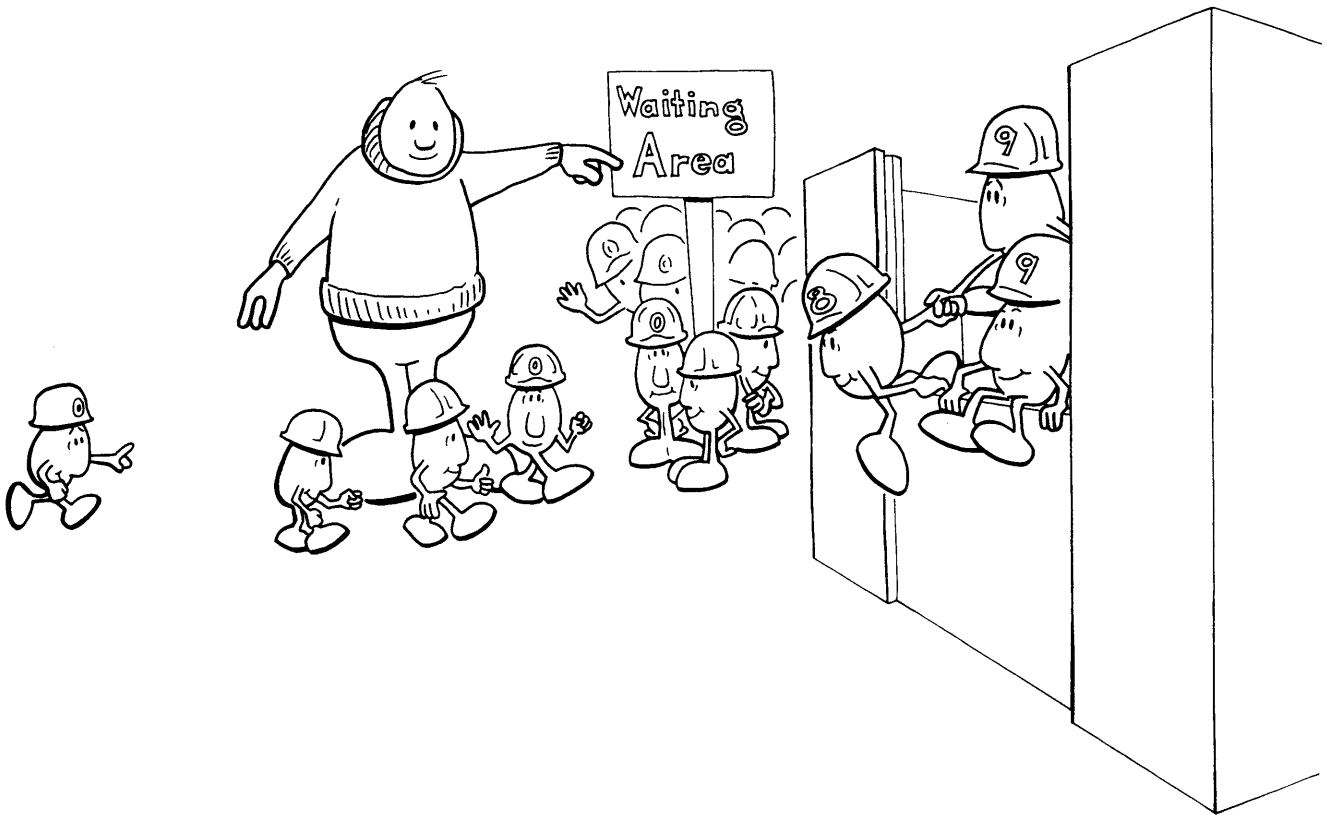
You can use the ALTJOB command to raise or lower a job's priority. Raising the priority tells the computer the job is urgent, and should be processed ahead of the others. Lowering the priority puts the job on hold until you change its priority or until you change the jobfence.

To change your job's priority to 0,

type: `ALTJOB #Jnnn;INPRI=0` Return
↑ (use your job number)

To check on it, type: `SHOWJOB #Jnnn` Return
(use your job number) ↑

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 or lowering the jobfence.

To raise the job's priority to 13,

type: `ALTJOB #Jnnn;INPRI=13` Return
↑ (use your job number)

Since you just gave your job the highest priority, you'll probably get a job logon message on the Console, like the one below, and a logoff message soon afterwards.

```
17:02/#Jnnn/23/LOGON FOR: MYJOB1,OPERATOR.SYS,OPERATOR ON LDEV #10
          ↑
   (your job number; the other
   numbers may be different)
```

If you don't, type: `SHOWJOB #Jnnn` Return
(use your job number) ↑

If the job's still waiting, then the computer is already processing as many jobs as the limit allows. As soon as one of the others finishes, yours will begin.

Starting Jobs In A Specific Order

The computer always processes the job with the highest input priority first. If two or more jobs assigned the same priority are waiting to begin, you can specify the order in which they are processed by changing their priority. To do so, use the ALTJOB command to assign the highest input priority to the job you want to start first, the next highest to the second job, and so on.

If you want to experiment with this now, follow these steps:

1. Raise the jobfence to 14 by typing: JOBFENCE 14
2. Start MYJOB by typing: STREAM MYJOB Return

   (The computer will print the job number on your screen and a "DEFERRED JOB" message.)
3. Repeat the STREAM command two more times so that you introduce a total of three deferred jobs to the computer.
4. Check on the jobs by typing: SHOWJOB WAIT Return

IMPORTANT

If the jobs are listed as "WAIT:1", 'WAIT:2", etc., then the number of jobs the computer can process at one time has been reached. You can still adjust the jobs' priorities; they just won't begin executing until another job ends. If you must begin processing these jobs right now, read "Starting A Rush Job When The Limit's Been Reached" on page 3-60.

5. To reverse the order in which they're processed, assign an input priority of 12 to the last job in the list.

   Type: ALTJOB #Jnnn;INPRI=12 Return
   ↑ *(use the number of the first job)*

6. Now assign an input priority of 10 to the second job.

   Type: ALTJOB #Jnnn;INPRI=10 Return

   ↑ *(use the number of the second job)*

7. Type: SHOWJOB WAIT Return

   The list should now show them ranked according to the priorities you assigned.

8. Start the jobs by lowering the jobfence to its original value, or 7, whichever is lower. (If you forgot what the number is for your computer, check on page 3-2.)

   Type: JOBFENCE 7 Return

   ↑ *(or use your original jobfence)*

Starting Jobs That Have Been Waiting

There are two ways to start waiting jobs. If the job is assigned an input priority of 1 or greater, you can reset the jobfence to 0, its lowest possible value. But, if a job's input priority is 0, you must raise it to a value greater than the jobfence; changing the jobfence has no effect.

To find out what the jobfence is, type: SHOWJOB STATUS Return

To change the jobfence, type: JOBFENCE n Return

(substitute a number between 0 and 14 for "n".) ↑

To change a job's priority,

type: ALTJOB #Jnnn;INPRI=n Return

↑ *(use a job number from your screen)*

↑ *(substitute a number greater than the current jobfence)*

Starting A Rush Job When The Limit's Been Reached

If you need to process your own job in a hurry, but there are already as many jobs executing as the job limit allows, perform the following steps:

1. If you're assigned OP capability, use the Editor to add ";HIPRI" to the first line of the job file. For example, if you need to rush MYJOB, your original job file, line 1 should look like this:

   :JOB MYJOB,OPERATOR.SYS;HIPRI

   If you're not assigned OP capability, add "INPRI=13" to the end of the first line, so it looks like this:

   :JOB MYJOB,OPERATOR.SYS;INPRI=13

2. Find out what jobs the computer is processing.

   Type: SHOWJOB EXEC Return

   ↑ *(this means "executing")*

3. Suspend any executing jobs with the BREAKJOB command. Using the job numbers from your screen,

   type: BREAKJOB #Jnnn Return

   Repeat the BREAKJOB command for each job that the computer is processing. (For more information, refer to "Suspending A Job" on the next page.)

4. If you added "HIPRI" to your job file in Step 2,

   type: JOBFENCE 14 Return

   Otherwise type: JOBFENCE 12 Return

5. Reset the job limit so that the computer will accept one more job. For example, if the current job limit is 2, raise it to 3.

   Type: LIMIT n Return

   ↑ *(your job limit, plus one)*

6. Stream the job by typing: STREAM MYJOB Return

7. A job logon message is sent to the Console when the job begins. When the job's finished, you'll receive a logoff message.

8. Reset the jobfence and job limit to their previous levels.
9. List all the jobs that you suspended.

   Type: SHOWJOB SUSP Return
10. Tell the computer to resume processing each suspended job:

    Type: RESUMEJOB #Jnnn Return
    ↑ *(use the number of a suspended job)*

    Repeat the RESUMEJOB command for each suspended job.

Suspending A Job

Type: SHOWJOB JOB=@J Return

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

To suspend a job that your computer is processing,

type: BREAKJOB #Jnnn Return
↑ *(use a job number from your screen)*

Check on the job by typing: SHOWJOB #Jnnn Return
(use your job number) ↑

The STATE column now describes the job as "SUSP". It will remain suspended until you tell the computer to begin processing it again.

To list any suspended jobs, type: SHOWJOB SUSP Return

If there aren't any, the computer will tell you that there are "NO SUCH JOB(S)". If any jobs are suspended, the computer will list them like this:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#J11    SUSP       105 SERIALP  WED 11:29P  JOB2.HPOFFICE

JOBFENCE= 6; JLIMIT= 3; SLIMIT= 12
```

(the numbers may be different)

Restarting A Suspended Job

To restart a suspended job, type: RESUMEJOB #Jnnn Return
(use a job number from your screen) ↑

To check on it, type: SHOWJOB #Jnn Return
↑ *(use your job number)*

Or type: SHOWJOB EXEC Return

Or type: SHOWJOB JOB=@J Return

If more than one job is being processed by your computer, the last two commands will list all of them. Find yours in the list.

Aborting A Job

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

Type: SHOWJOB J@B=@J Return

Check to see if any of your variations of MYJOB are listed. If they are, get rid of them, one at a time, with the ABORTJOB command. If not, read through the example, but don't abort any jobs.

Type: ABORTJOB #Jnnn Return

↑ *(use the job number assigned to MYJOB)*

Using the same job number, type: SHOWJOB #Jnnn Return

If the computer tells you that there are "NO SUCH JOB(S)", then you succeeded. Repeat the ABORTJOB command for each variation of MYJOB listed.

For More Information

You'll find a complete description of the commands you've used in this chapter in the MPE V/R Commands Reference Manual (Part Number 32033-90006).

Looking Back

1. What two things must you include in a job file?

2. What are two messages you'll see if the computer accepts your job when you start it?

3. How do you give the computer new job processing instructions for your own job? For other users' jobs?

4. What are two ways you can restrict job processing on your computer?

5. What six things can you do to another user's job, and under what circumstances can you give the computer the new job processing instructions?

Managing Jobs Quick Reference

To Do:	Do This:
Create a job file:	1. Type: EDITOR Return 2. When the "/" appears, type: ADD Return 3. When the first line number is disabled, type: :JOB *(job file name)* ,OPERATOR.SYS Return 4. Type each instruction, beginning the line with a colon and ending it by pressing Return 5. End the job by typing: :EOJ Return 6. Type: // Return 7. Type: KEEP *(job file name)* Return 8. End the Editor by typing: EXIT Return
Edit a job file:	1. Type: EDITOR Return 2. When the "/" appears, type: TEXT *(job file name)* Return 3. Type: LIST ALL Return 4. Type: MODIFY n Return ↑ *(the number of the line you want to edit)* 5. Modify the line. 6. When you're through modifying the file, press Return 7. Type: KEEP *(job file name)* Return 8. Type: YES Return to purge the old version of the file. 9. Type: EXIT Return

To Do:	Do This:
Start a job now:	Type: STREAM *(jobname)* Return
Schedule a job to start at a specific time:	Type: STREAM *(jobname)* ;AT=hh:mm Return ↑ *(the time, using a 24-hour clock)*
Schedule a job to start in a while:	Type: STREAM *(jobname)* ;IN=dd,hh,mm Return ↑ *(days, hours, and minutes from now)*
Defer your own job, edit line 1 to look like:	:JOB (jobname),OPERATOR.SYS;INPRI=1
Make sure your job is processed, edit line 1 to look like:	:JOB (jobname),OPERATOR.SYS;HIPRI
Restart your job automatically, edit line 1 to look like:	:JOB (jobname),OPERATOR.SYS;RESTART
Print job results on a different printer, edit line 1 to look like:	:JOB (jobname),OPERATOR.SYS;OUTCLASS=nn ↑ *(the printer's LDEV number)*
Print multiple copies of a job report, edit line 1 to look like:	:JOB (jobname),OPERATOR.SYS;OUTCLASS=,,n ↑ *(the number of copies)*

To Do:	Do This:
List all jobs:	Type: SHOWJOB JOB=@J Return
List executing jobs (and sessions):	Type: SHOWJOB EXEC Return
List waiting, or deferred, jobs:	Type: SHOWJOB WAIT Return
List suspended jobs:	Type: SHOWJOB SUSP Return
List scheduled jobs:	Type: SHOWJOB SCHED Return
Check the jobfence and job limit:	Type: SHOWJOB STATUS Return
Keep jobs from logging onto the computer:	Type: LIMIT 0 Return Or type: JOBFENCE 14 Return
Suspend an executing job:	Type: BREAKJOB #Jnnn Return
Restart a suspended job:	Type: RESUMEJOB #Jnnn Return
Abort a job:	Type: ABORTJOB #Jnnn Return

To Do:	Do This:
Send a job's report to another printer:	Type: ALTJOB #Jnnnn;OUTDEV=nn Return ↑ *(the printer's LDEV number)* Or type: ALTJOB #Jnnnn; OUTDEV=LP Return ↑ *(or your printer's device class name)*
Change the priority of someone's job:	Type: ALTJOB #Jnnnn;PRI=n Return ↑ *(the new priority)*

Introduction To Chapter Four

This chapter explains how your printer works, what spooling is, and how the spooler manages the printing process. You're taught which commands to use to manage the printer so that you can control who prints reports and when.

Printers are generally shared by everyone using the computer. Your computer may have more than one printer, but it's unlikely that each person has their own. It's also true that a printer can't truly be shared without someone, or something, managing it: you wouldn't want part of your report printed on the same page with part of another person's report.

For this reason, a printer "spooler" manages the smooth flow of reports to and from your printer. It performs the following tasks:

- Acts on a print command by collecting all of the information needed to print a report and storing it in a special file called a "spool file".
- 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 this on its own. It even gives the appearance that each user has exclusive use of the printer. You'll only be aware of the spooler when you want an overview of the printing process, if you're interested in the status of a specific report, or when you need to intervene and manage the printer yourself.

This chapter also teaches you how to copy spool files onto a tape for safekeeping, and how to transfer them back to the computer to be printed.

4 Managing Your Printer

Identifying Your Printer

You are responsible for the operation of system printers, not printers intended for someone's personal use. System printers are:

- Shared among all computer users.
- Almost always located next to the computer and the Console so that you can keep an eye on everything.
- Controlled by a "spooler" which oversees the orderly printing of everyone's reports.
- Your responsibility to maintain. This includes adding paper, fixing paper jams, and checking that the spooler is managing alright. You're also responsible for separating, sorting, and distributing the printed reports.

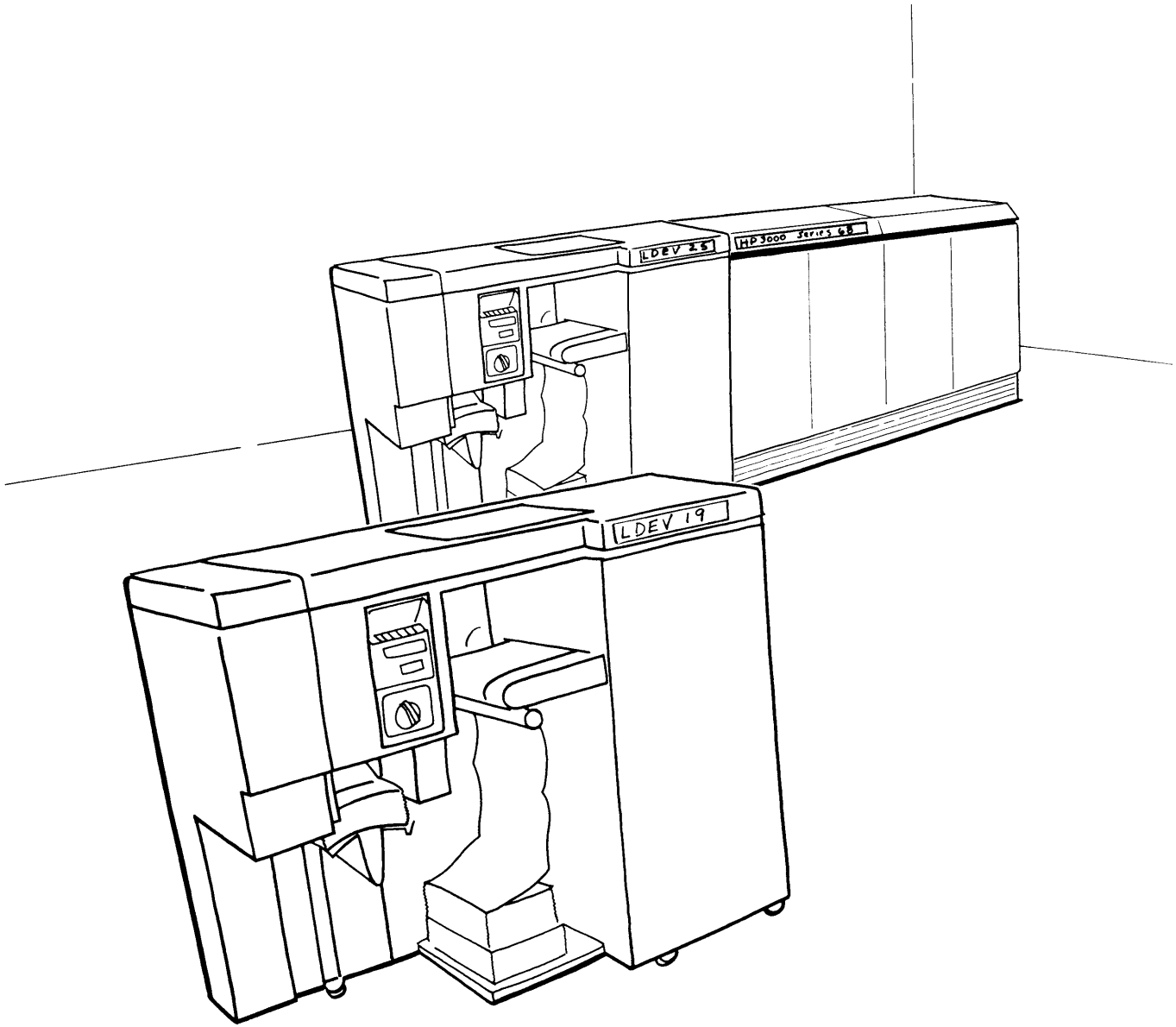
If you read Chapter One, you should know how many printers are connected to your computer, where they are located, and the computer names for each one. Check the printer information you recorded on page 1-2, or refer to "Controlling Peripheral Devices From The Console" in Chapter One.

How Printer LDEV Numbers Are Used

Chapter One also instructed you to print a list of computer equipment and post it near the Console. This list includes the LDEV numbers and device class names of your printers. If you don't have one, read "Creating A Complete List Of Devices" in Chapter One and use it as you read the information below. Or, if you are already familiar with your printers, skim the following information as a review.

Each printer connected to your computer is assigned a unique LDEV number. This way, even two identical printers can be distinguished from one another.

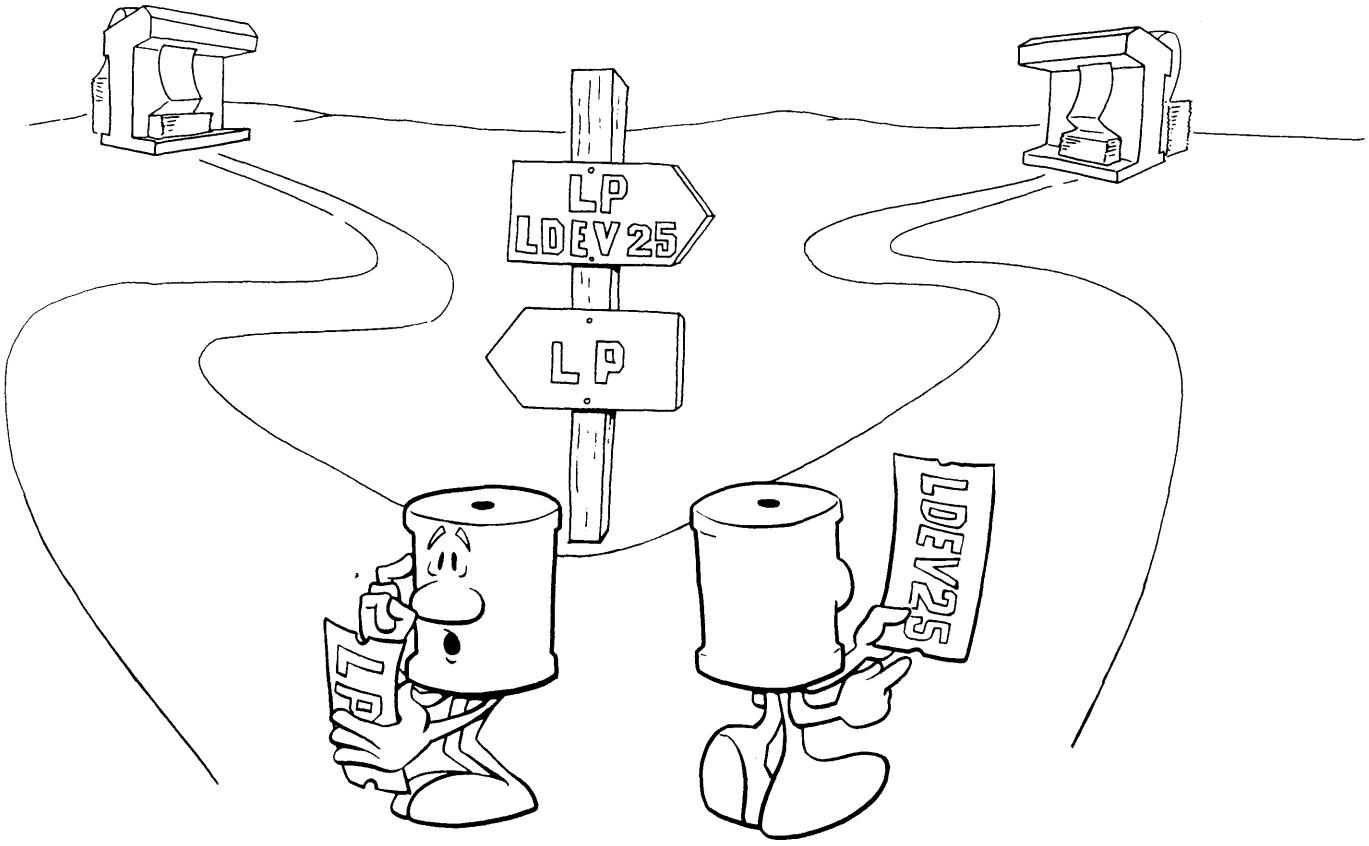
You'll use the LDEV number to gather information about the printer(s) and to issue printing commands to the computer. Likewise, when the computer has some information for you, it will refer to the printers by their LDEV number.


LDEV 25
HP 3000 Series 68
LDEV 19

How Device Class Names Are Used

You can also use "device class names" to refer to your printer(s). Unlike LDEV numbers, device class names are not unique to each device. All of your printers, for example, could be assigned the device class name "LP". (LP, which stands for "Line Printer", is a common device class name.)

If you send a report to LDEV 25, it can only be printed on that printer. But if you tell the computer to print your report on "LP", the computer could send it to either one.



What SHOWDEV Tells You About Your Printers

IMPORTANT

You must know the LDEV numbers and device class names of your printer(s) to try the examples in the next few pages, and to understand the remainder of the chapter.

Look at the device class names in the last column of your list of computer devices. You can use any of the names for your printer to find out a little more about it. For example, if one or more printer is named "LP":

Type: SHOWDEV LP Return
↑ *(or use a device class name from your list)*

```
:SHOWDEV LP (what you typed)
LDEV      AVAIL      OWNERSHIP      VOLID          DEN     ASSOCIATION
6         SPOOLED    SPOOLER OUT
```

This tells you the following things about your printer:

- The logical device number. In the sample above, it's 6.
- Whether or not the printer is available to print reports. If it's "SPOOLED", it can be shared among all computer users. If it's "UNAVAIL(able)" to users, SHOWDEV tells you that, too.
- Whether or not the printer is controlled by a spooler. "SPOOLER OUT" means the spooler controls the output, or printing, of reports. (The spooler is explained in "What Really Happens When A Report Is Printed" on page 4-13.)

Try the SHOWDEV command again, this time using the LDEV number that appeared in the first column. You'll get the same information about just one printer.

Type: SHOWDEV ␣ Return

```
:SHOWDEV ␣ (what you typed)
LDEV      AVAIL      OWNERSHIP      VOLID          DEN     ASSOCIATION
␣         SPOOLED    SPOOLER OUT
```

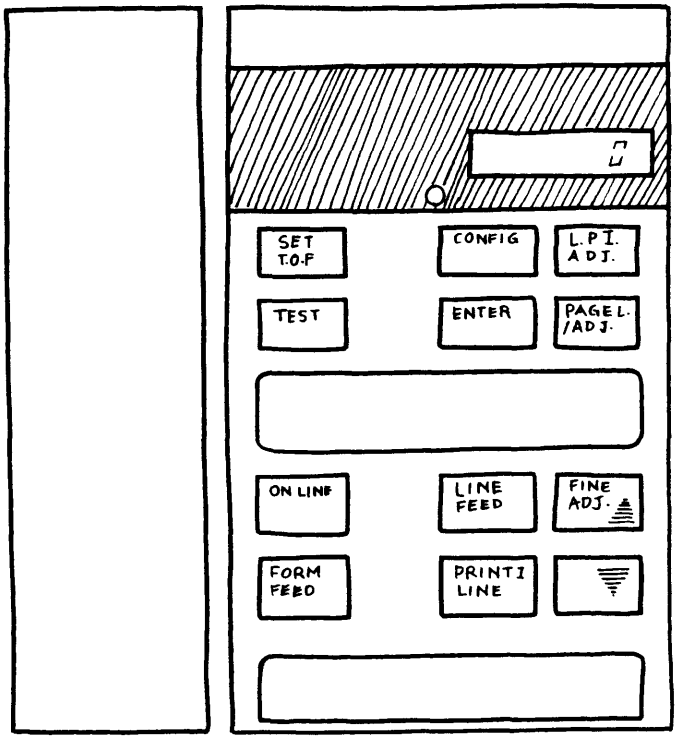
Repeat the SHOWDEV command for each printer connected to your computer. Try it twice, using the device class name once, and the printer's LDEV number the second time.

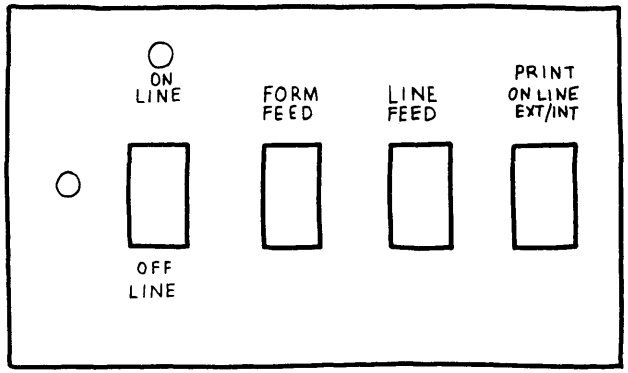
Stopping And Starting The Printer

Most printers can be controlled with an ONLINE button. This lets you interrupt the printing process without turning the power off.

A printer is online when it's available to the computer, and to users, for printing. If a printer is offline, it cannot print anything, even if everything else is okay.

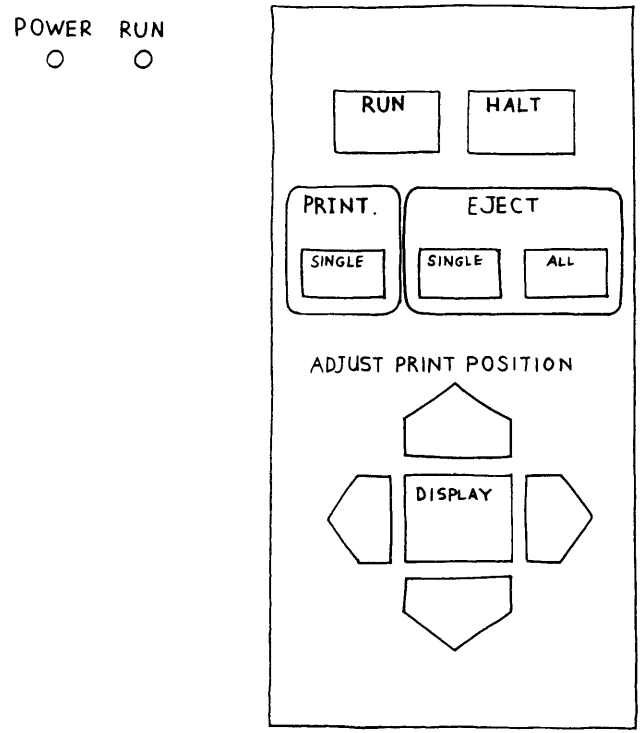
If your printer has an ONLINE button, you'll press it once to take the printer offline, then press the same button again to put the printer back online. You'll know it's online if the light next to the ONLINE button is lit.





Some printers that use an ONLINE button also have an OFFLINE button; check to see if yours does.

Other printers manufactured by Hewlett-Packard use RUN and HALT buttons. To take the printer offline, press HALT. To put the printer back online, press RUN. The message window on the printer itself tells you whether the printer is stopped (offline) or not.



IMPORTANT

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

Basic Printer Maintenance

The most time-consuming part of monitoring the printer is separating and distributing printed reports. If your printer is used heavily, this can seem to be a never-ending task. But, if you set up a well-organized distribution scheme, it's not difficult.

If you're a new Operator who's just joined the computer management staff, ask one of the other experienced Operators to show you how to stop the printer, separate reports, and distribute them to your users. Then skip to "A Checklist For Other Maintenance Tasks" on page 4-13, and find out any additional information you will need to take care of your printer(s).

If you're on your own, read Steps One through Five, next.

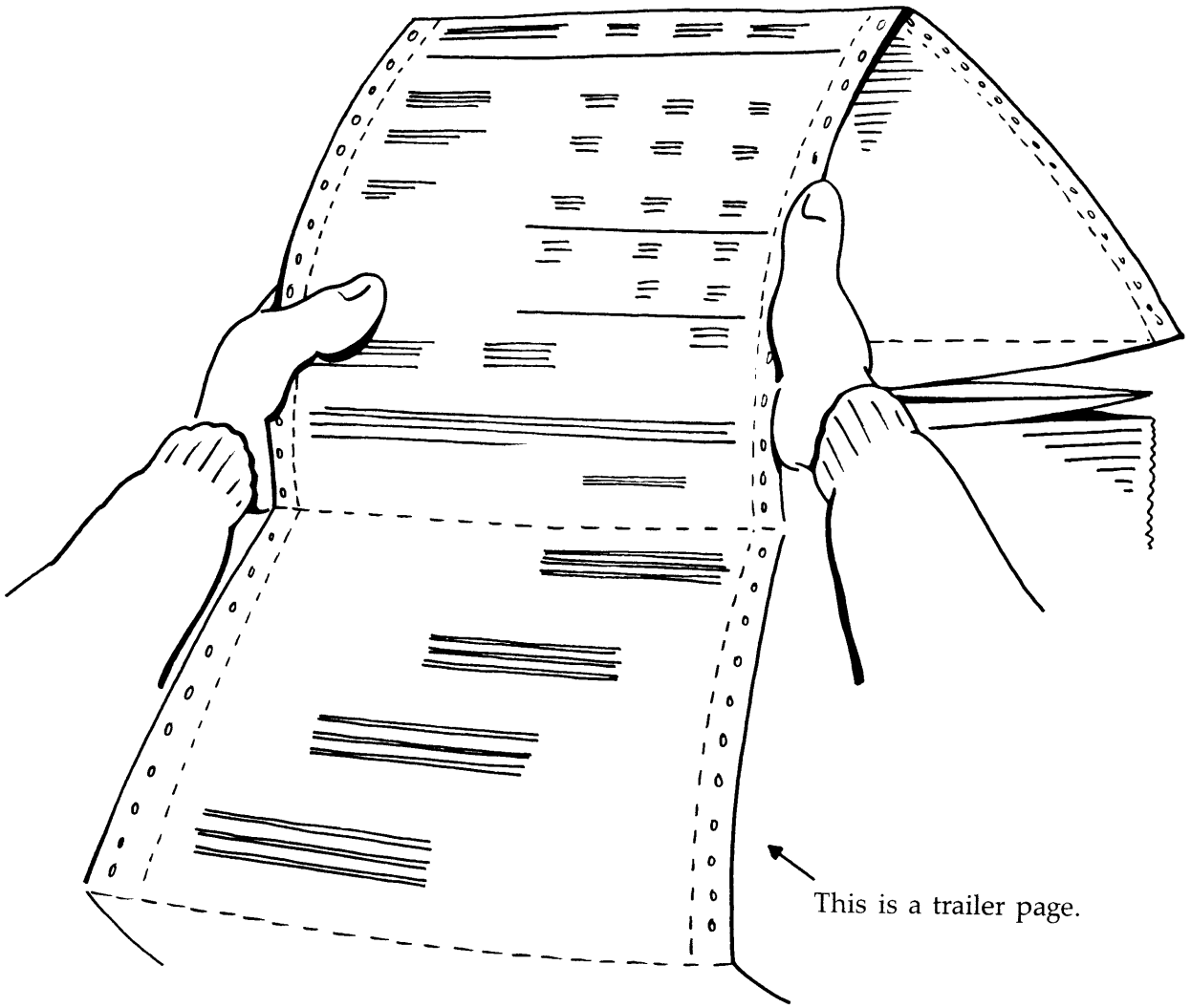
Step One: Stop The Printer

To remove the stack of reports that have already been printed, stop the printer for a few seconds by pressing the ONLINE, OFFLINE, or HALT button.

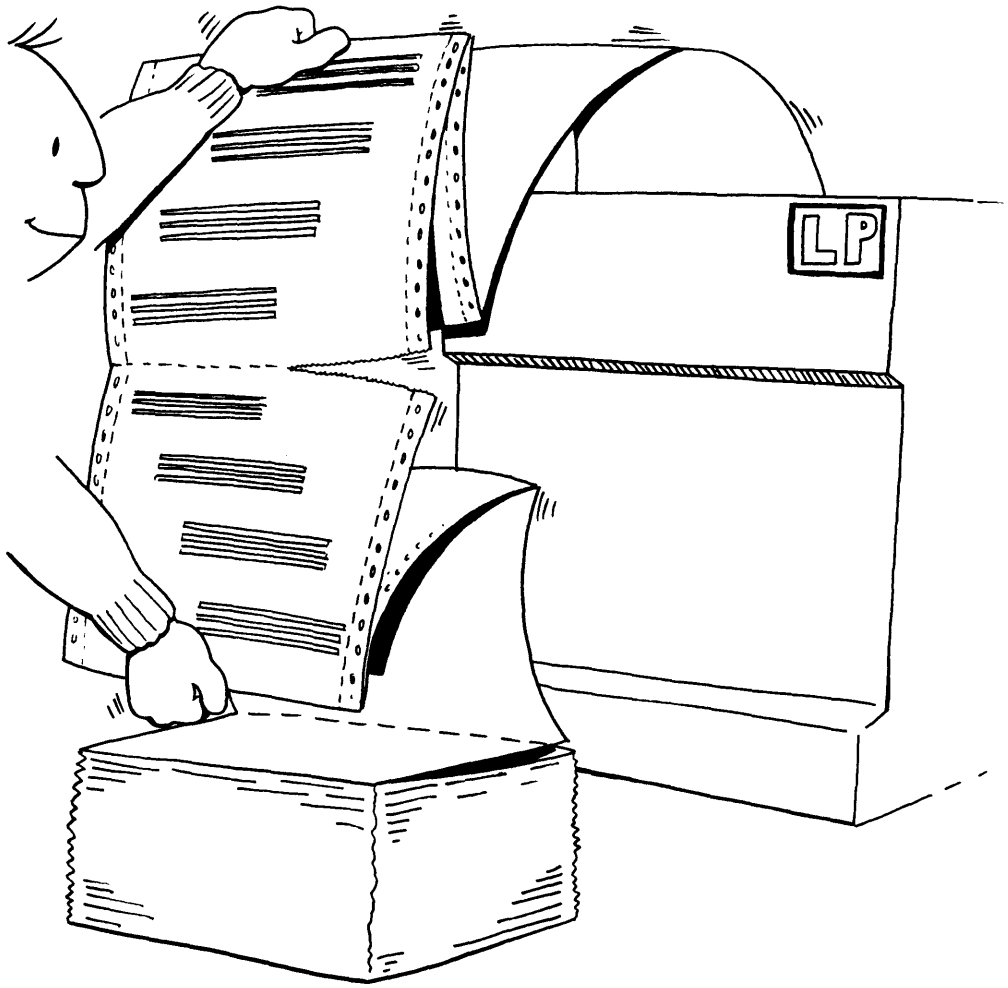
Step Two: Tear Off The Report

If you stopped the printer before it began printing another report, press the EJECT or FORM FEED button once. One or more blank pages will be fed through the printer until the last page of the printed report clears the paper feeder. Tear the paper at the perforation, then skip to Step Three.

If you stopped the printer in the middle of a report, look for the final page of the last complete report. Another page, called a "trailer", will be attached to it. Though the trailer isn't part of the report itself, it helps you identify the 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.


This is a trailer page.

The trailer page of the last complete report immediately precedes the header page of the next report, like this:



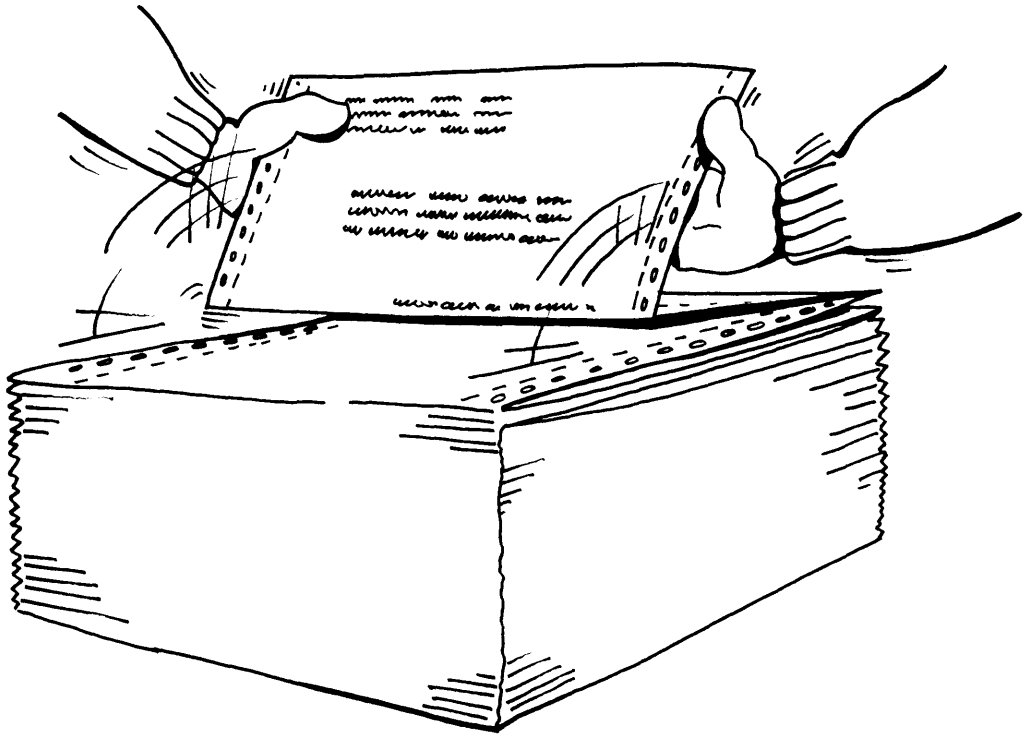
Tear the paper where the trailer and header pages meet.

Step Three: Restart The Printer

Press the ONLINE or RUN button to restart your printer.

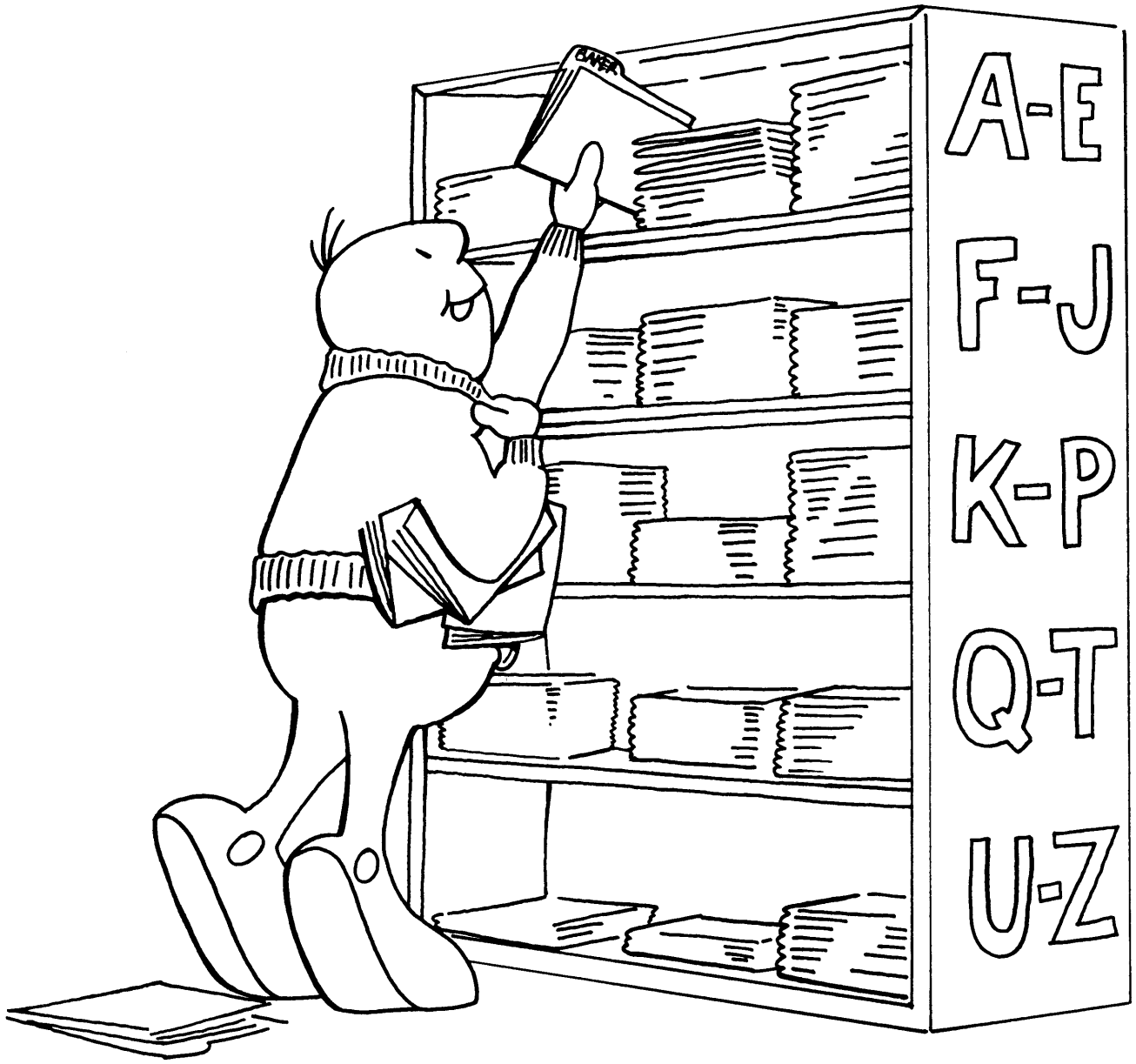
Step Four: Separate The Reports

Each report begins with a header page and ends with a trailer page. Using these as a guide, separate the reports. If necessary, fold back half of the top page to expose the header information, as shown below:



Step Five: Sort And Distribute The Reports

The simplest method to sort the reports is alphabetically, using the first letter of the computer identity. Then separate them into alphabetical groupings and stack the reports on clearly labelled shelves or in bins near the computer. (Use smaller groups if your printer is used frequently; it will be more convenient for users to find their reports.)


A-E
F-J
K-P
Q-T
U-Z

A Checklist For Other Maintenance Tasks

Printers, like any other piece of equipment, require basic maintenance. The operators manual that accompanied the printer gives you the information you need. Or, if another experienced Operator is available to help you, ask him or her. Either way, find out the following information about your printer(s):

- What maintenance procedures are required?
- How often should basic maintenance be performed?
- What maintenance procedures are recommended, and how frequently?
- What supplies do you need to maintain the printer?
- Where are the printer supplies stored?
- How do you order more supplies?
- Is there anyone you can call to assist you with maintenance or troubleshooting?
- Where is their phone number listed?

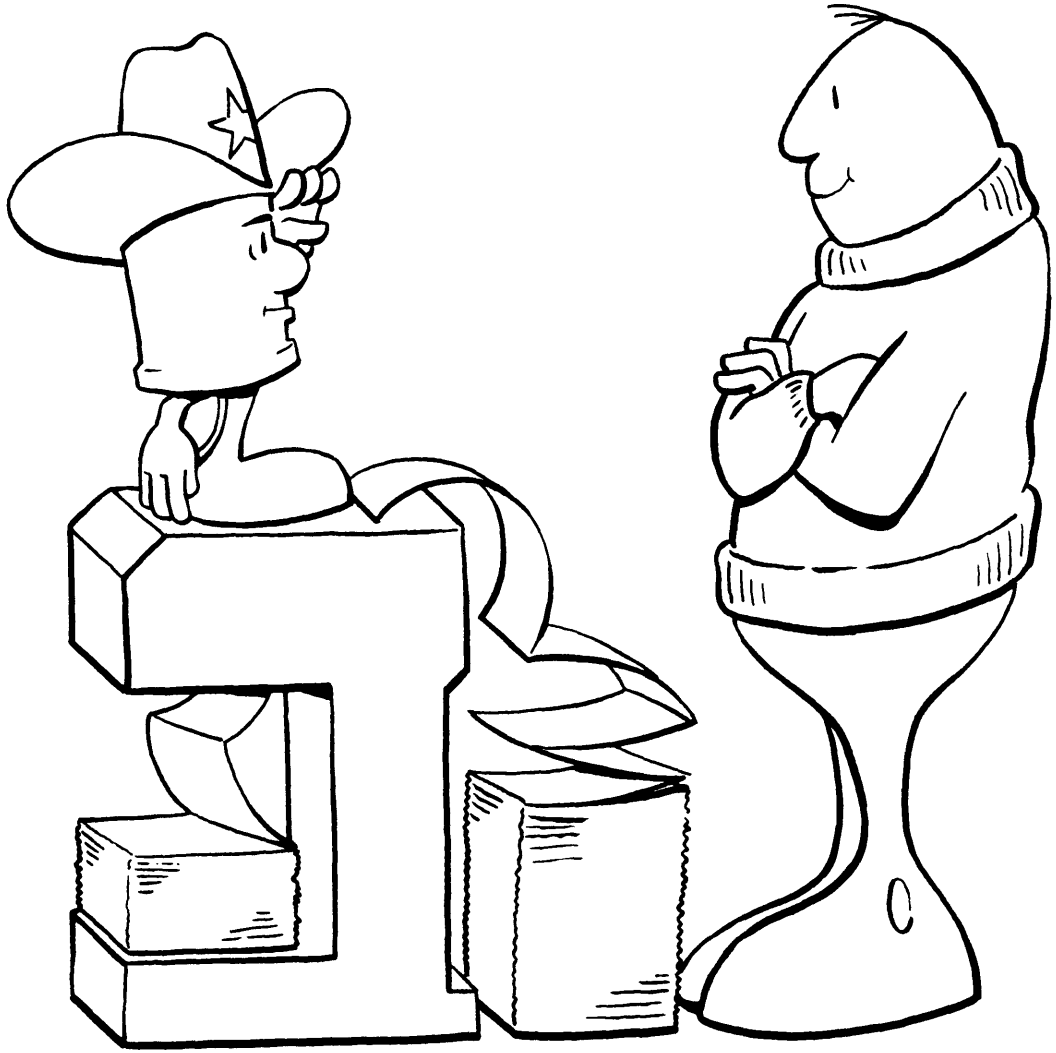
Relying on the Spooler: What Really Happens When a Report is Printed?

There are three parts to the printing process:

- The mechanical process of printing reports on paper.
- The printer spooler. It's a special program that controls which reports are printed, where they're printed, and when.

- Your job, which is to oversee and manage the spooler from the Console. Think of the spooler as a special supervisor that reports to you. When you need to find out what's happening with the printer, you'll ask the spooler.

Printing a report is a lot more complex than it appears. As the Operator, you must understand some important basic concepts and terms because you're expected to manage the spooler when it isn't managing on its own.



Step One: Command The Computer To Print A Report

The printing process starts when someone commands the computer to print a report. Sometimes, a report is automatically created. Job results, as you learned in Chapter Three, are always sent to the printer.

To see how the process works, follow the directions below to send your own report to the printer.

IMPORTANT

You must know the LDEV number or device class name of one of your printers to follow the example below. If you labelled your printer, check it. If not, check the information you recorded on page 1-2.

Ask the computer for a list of your files.

Type: LISTF Return

Find the name of your original job file and use it in the following examples. (If you read Chapter Three, you should have at least one file named "MYJOB" or something similar.) If your job file isn't listed, follow the directions in Chapter Three, page 3-5, to create a job.

Use the FILE command, next, to name your report "OPREPORT" (so that you can distinguish it from the others) and assign it a low priority, 1, so it won't be printed right away:

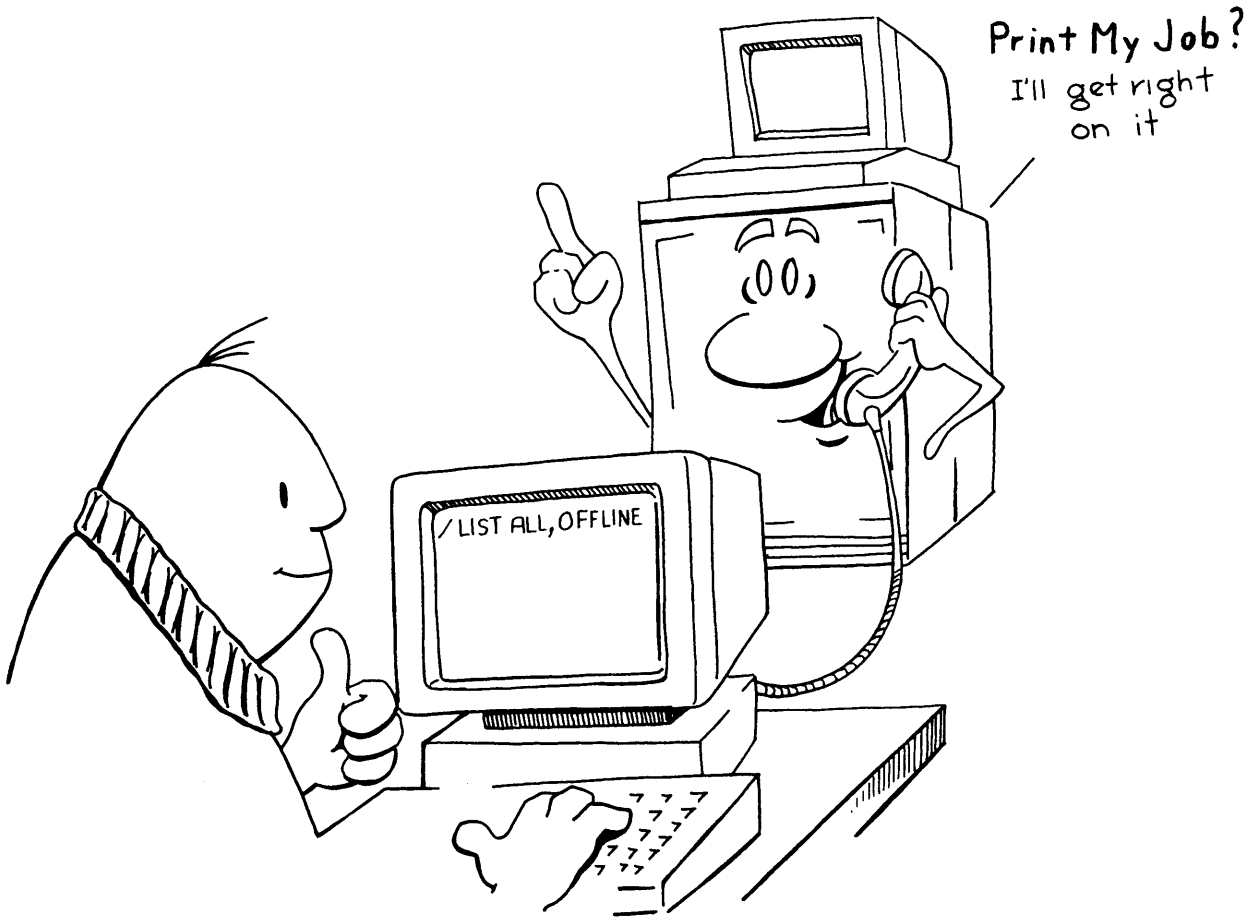
Type: FILE OPREPORT;DEV=nn,1 Return
(use your printer's LDEV number ↑ or device class name)

Start the Editor by typing: EDITOR *OPREPORT Return

Tell the Editor which file you want by typing: TEXT MYJOB Return
(or use your job file name) ↑

"Print" the file on your screen by typing: LIST ALL Return

Print the file on paper by typing: LIST ALL,OFFLINE Return



You'll know the process of printing your report has begun when you see this:

```
/LIST ALL, OFFLINE  (what you typed)
 ***OFF LINE LISTING BEGUN.***
/_
```

The process involves much more than printing lines of text onto paper. But before you continue reading about the spooler, end the Editor:

Type: EXIT Return

```
END OF SUBSYSTEM
:_
```

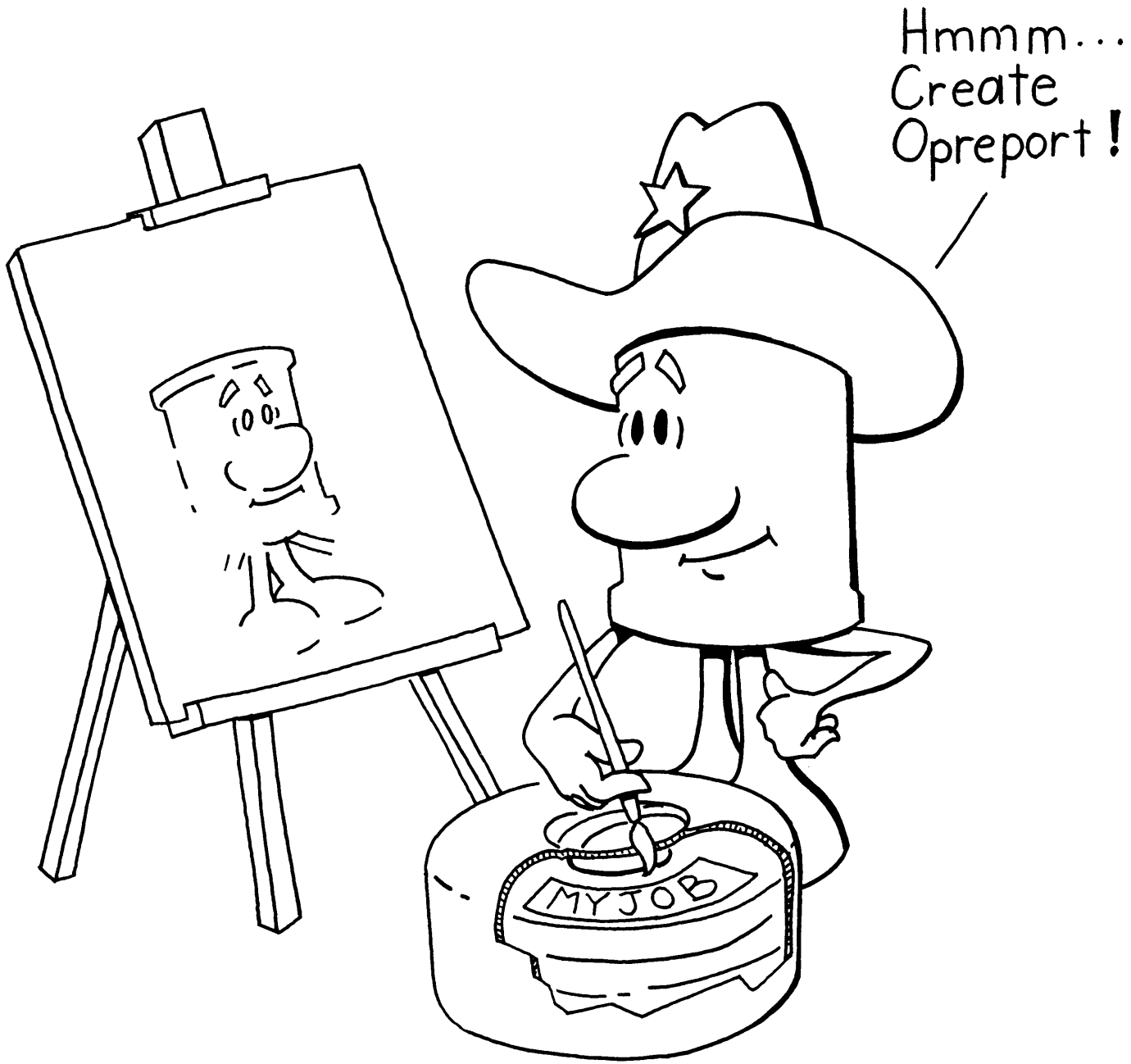
Step Two: The Spooler Creates A Spool File

The computer executes your "LIST ALL, OFFLINE" command by getting the spooler involved. The spooler collects the information it needs to print the report, and begins creating a "spool file".

IMPORTANT

Spool files, like permanent files, are stored on your computer's disc in a special area reserved exclusively for them. Unlike permanent files, they are erased, or "purged", as soon as the report is printed.

MYJOB can't be printed "as is" because the computer needs more information to print your report than just the text of your file. That's why spool files are created: they contain all the information needed to print a report.


Hmmm...
Create
Opreport!
MYJOB

Step Three: Ask For A List Of Spool Files

When you want to know who has sent reports to the printer, ask the computer for a list of spool files.

Type: SHOWOUT SP Return

Spool files will be listed something like the example below. (The "SHOWOUT SP" command, and the list of spool files, will be fully explained as you read this chapter.) On your screen, look for the spool file named "OPREPORT". That's the report you just commanded the computer to print.

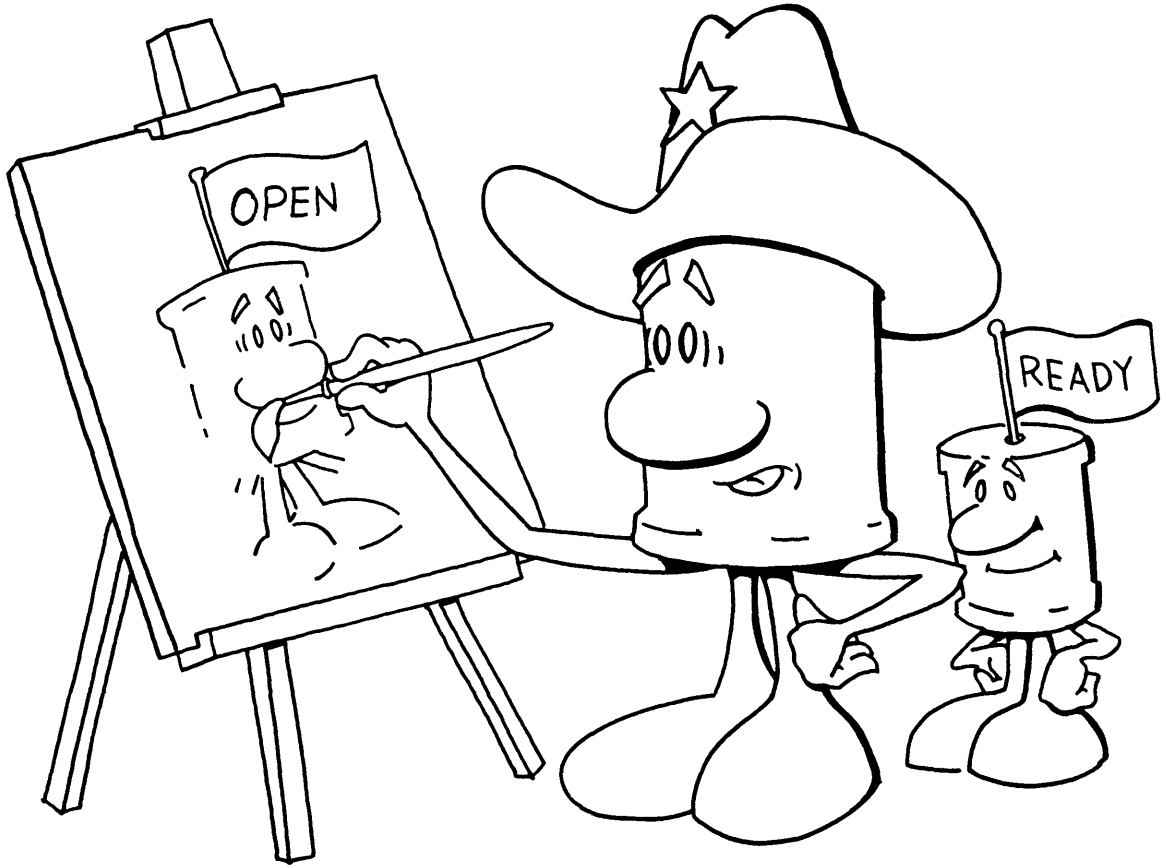
```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C

LP       #05875  #111    $STDLIST READY       2048      8   1
LP       #05876  #S12    $STDLIST READY       1096      8   1
LP       #Onnnn  #Snnn   OPREPORT OPENED      100     D 1   1
                           ↑ (the spool file's name)
```

Check the STATE column in the example above, and on your Console screen. It tells you whether or not the spooler is finished creating your spool file.

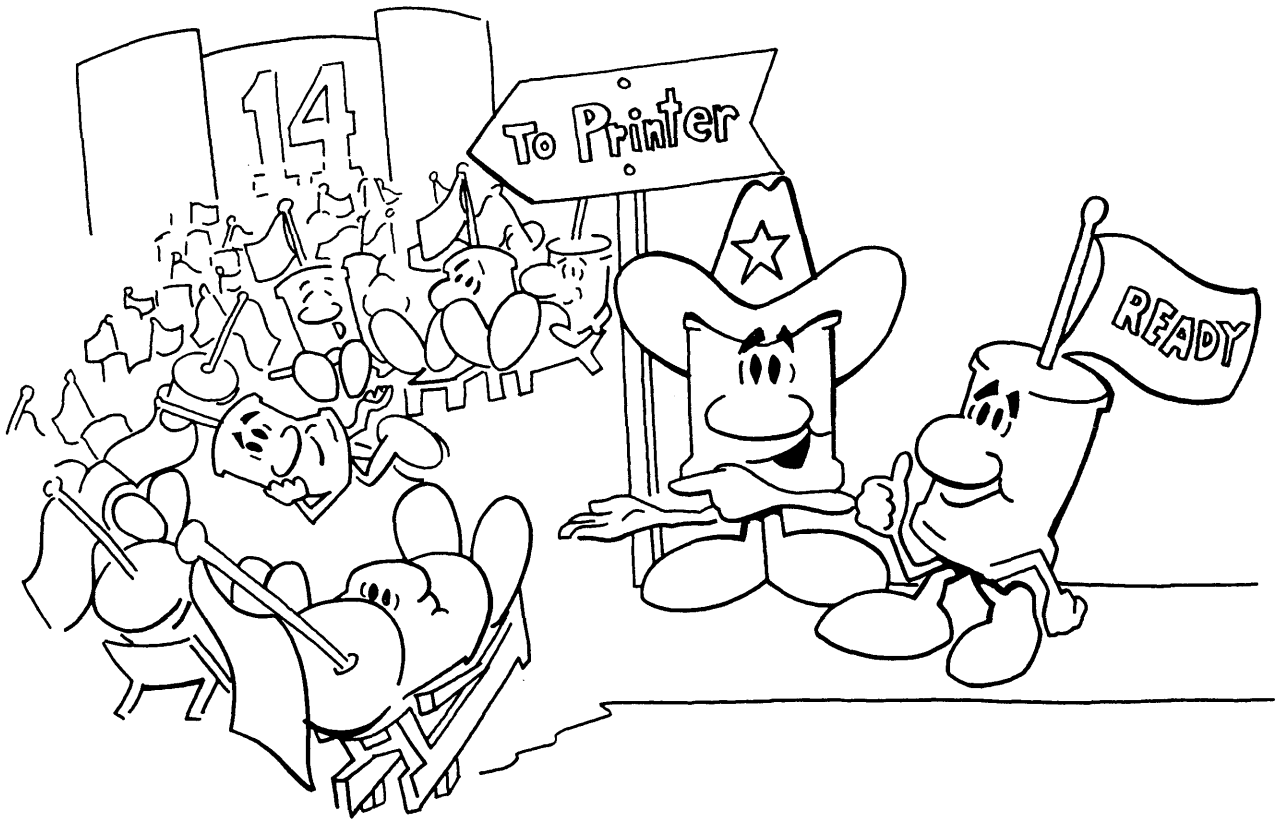
Step Four: The Spool File Waits To Be Printed

Complete, or "READY", spool files wait their turn to be printed. To ask for a list of just these,

type: SHOWOUT READY Return



While the spooler is building the spool file, your report is listed as "OPENED". When it's finished, its state changes to "READY".

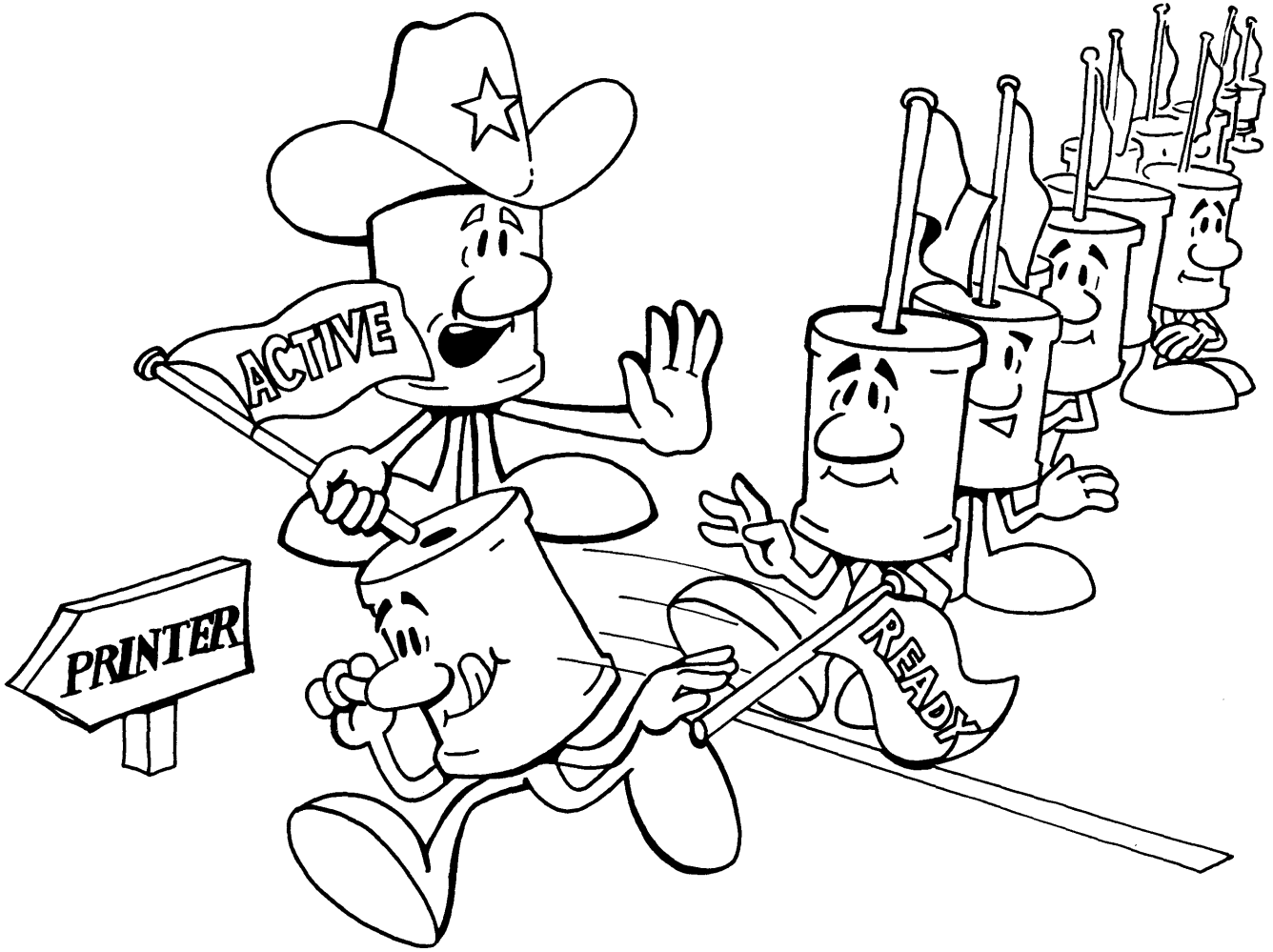


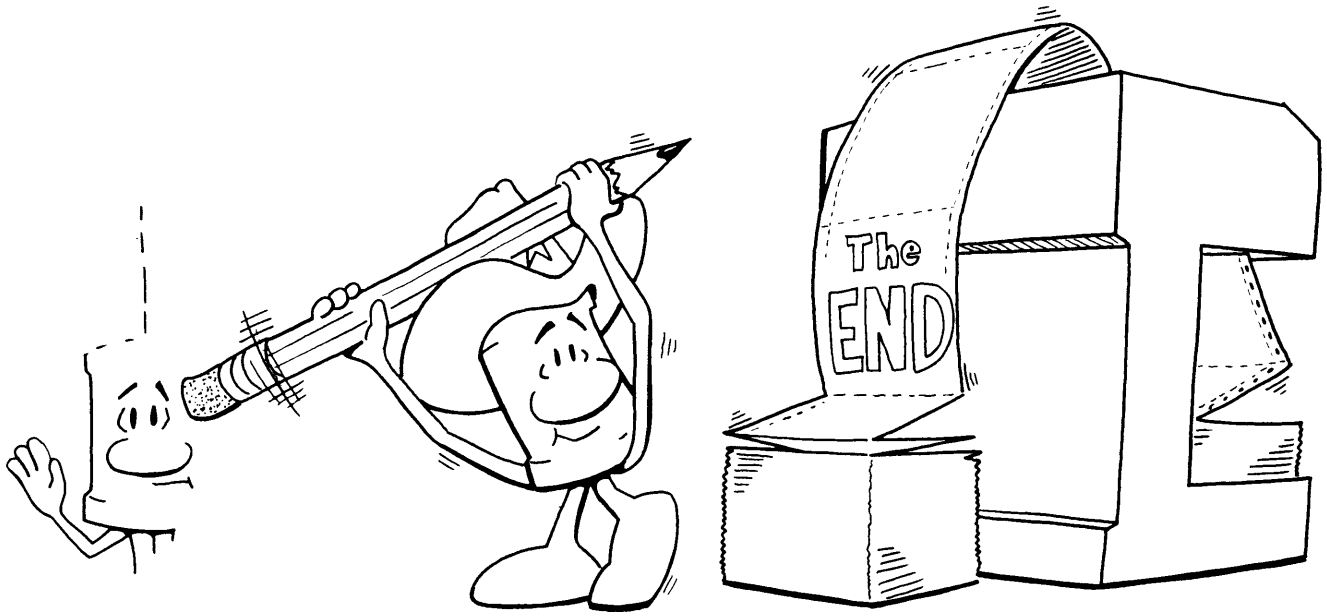
If your report is complete, as in the example below, it will appear in the list. If it's still "OPENED", or incomplete, it won't.

```
DEV/CL    DFID     JOBNUM   FNAME     STATE FRM SPACE RANK PRI #C

LP        #05875   #S111    $STDLIST  READY       2048       8   1
LP        #05876   #S12     $STDLIST  READY       1096       8   1
LP        #0nnnn   #Snnn    OPREPORT  READY       100      D 1   1
```

Step Five: The Spool File Is Printed

When the printer finishes a report, the next is selected from the spool files that are ready to be printed. While it's printing, the spool file is considered "ACTIVE".





Once a report is printed, the spool file is erased, or "purged" from the disc. As a result, it won't appear in the list of spool files. So, if you no longer see your report in the list of spool files, then you know it's been printed.

Who's Using The Printer

To find out who's using the printer, ask the computer for a list of spool files.

Type: SHOWOUT SP Return

You'll see two kinds of information. The top part will list unprinted spool files, like this:

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C

LP       #05875  #S111   $STDLIST ACTIVE      2048       8   1
LP       #05876  #S12    $STDLIST OPENED      2048       8   1
SERIALP  #05925  #S257   LP       OPENED      2048       8   1
LP       #05635  #J26    OPREPORT READY        100     D 1   1
SERIALP  #05509  #J23    $STDLIST READY        172     D 1   1
LP       #05835  #S32    $STDLIST OPENED      2048     D 0   1
```

Each line describes one spool file. The information you'll be concerned with can be deciphered in the following way:

`DEV/CL` The LDEV number or device class name of the printer that the report was sent to.

`DFID` The Device File Identification number of the spool file. Each spool file is assigned a unique device file ID number, which you can use to request information about the report and to control how it's printed.

`JOBNUM` The session or job number of the person, program, or job that originated the report.

FNAME — A special file name. You'll become accustomed to seeing certain common names, like "$STDLIST". You can also assign your own file name to a report with the FILE command, as you did in Step One, on page 4-15.

STATE — The processing state, which tells you if the report is ready for printing ("READY"), if it isn't ("OPENED"), or if it's being printed right now ("ACTIVE").

PRI — The output priority of the spool file, which determines the order in which reports are printed, or if they're on hold.

#C — The number of copies of the report that will be produced.

The second part summarizes the list, like this:

```
6 FILES (DISPLAYED):
    1 ACTIVE
    2 READY; INCLUDING  2 SPOOFLES, 0 DEFERRED
    3 OPENED; INCLUDING 4 SPOOFLES
    0 LOCKED; INCLUDING 0 SPOOFLES
    6 SPOOFLES:  8464 SECTORS  ↑ (the computer's abbreviation
OUTFENCE = 6                     for "spool files")
```

The outfence is used to control which reports are printed. If a spool file's priority isn't higher than the outfence, then it won't be selected for printing, even if it's "READY".

In the example above, a single outfence, 6, is set for the entire computer system. If you have more than one printer, individual outfences, listed below the system outfence, may be set for each one.

Which Reports Are Ready To Print?

Check the STATE column in the sample listing or on your Console. Spool files described as "READY" are eligible to be printed. To list just these,

type: SHOWOUT READY Return

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C
LP       #05635  #J26    $STDLIST READY         100    D 5   1
SERIALP  #05509  #J23    $STDLIST READY         172    D 3   1
```

The summary information at the bottom of the screen tells you that only "2 FILES" are "DISPLAYED". Since you asked specifically for a list of "READY" files, this means that only two are ready for printing. The third line in the summary says the same thing:

```
2 FILES (DISPLAYED):
    0 ACTIVE
    2 READY; INCLUDING  2 SPOOFLES, 0 DEFERRED
    4 OPENED; INCLUDING 4 SPOOFLES
    0 LOCKED; INCLUDING 0 SPOOFLES
    6 SPOOFLES:  8464 SECTORS  ↑ (the computer's abbreviation
OUTFENCE = 6                     for "spool files")
```

If no spool files had been ready for the printer, the computer would have replied "NO SUCH FILE(S)".

Which Reports Aren't Ready?

When you command the computer to print a report, the spooler begins creating a spool file. Until it's ready for printing, the spool file is listed as "OPENED". To list just these,

type: SHOWOUT OPEN Return

In the example below, four spool files are still open, or incomplete.

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C
LP       #05875  #S111   $STDLIST OPENED      2048      8   1
LP       #05876  #S12    $STDLIST OPENED      2048      8   1
SERIALP  #05925  #S257   LP       OPENED      2048      8   1
PP       #05835  #S32    LISTOP   OPENED      2048    D 0   1

4 FILES (DISPLAYED):
    0 ACTIVE
    0 READY; INCLUDING  0 SPOOFLES, 0 DEFERRED
    4 OPENED; INCLUDING 4 SPOOFLES
    0 LOCKED; INCLUDING 0 SPOOFLES
    6 SPOOFLES:  8464 SECTORS
OUTFENCE = 6
```

Which Report Is Being Printed Now?

To find out which report the printer is printing,

type: SHOWOUT ACTIVE Return

The computer will list the report in the same form it lists the others. If you have only one shared printer, there will only be one "ACTIVE" report at a time.

But, if the computer tells you there are "NO SUCH FILES", then it isn't printing anything right now. To find out why,

type: SHOWOUT SP Return

You'll see a list of any and all spool files—ready for printing, or otherwise, or the computer may tell you that there are "NO SUCH FILE(S)". If there are no spool files at all, then of course there is no active file because the printer is idle. If you do see a list of files, but none are being printed, check three things:

- Are there any spool files that are listed as "READY"? If not, then the printer will remain idle until one is.
- Is the outfence set to a high number, like 13 or 14? This will prevent reports from being printed.
- Is the output priority of each spool file set to a low number (or a number below the outfence)? This also prevents reports from being printed.

You'll learn how to adjust the outfence and output priorities when you read "When You Should Intervene: Managing The Spooler" on page 4-32.

Matching Reports To Users

There isn't anything that explicitly tells you who sent a report to the printer. So how do you figure this out? First, find out who's using the computer.

Type: SHOWJOB Return

The top part of your screen lists each session and job individually, like this:

```
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#S111   EXEC        20  20       MON  8:22A  OPERATOR.SYS
#J26    EXEC        105 LP       WED 11:29P  JOB1.HPOFFICE
#S257   EXEC        54  54       SUN  9:06A  JULIE.JONES
#S34    EXEC        48  48       SUN  1:39P  BRENDA.
#S12    EXEC        59  59       MON  8:07A  JUNE,MGR.INT
  ↑ (job or session numbers)          (computer identities) ↑
```

Most people use all or part of their name to identify themselves, so you should be able to tell who's who. Look at the list of computer identities on your screen. Do you know who's using your computer?

You can find out if one person is printing anything by using their session or job number in the following command:

Type: SHOWOUT JOB=#Snnn Return

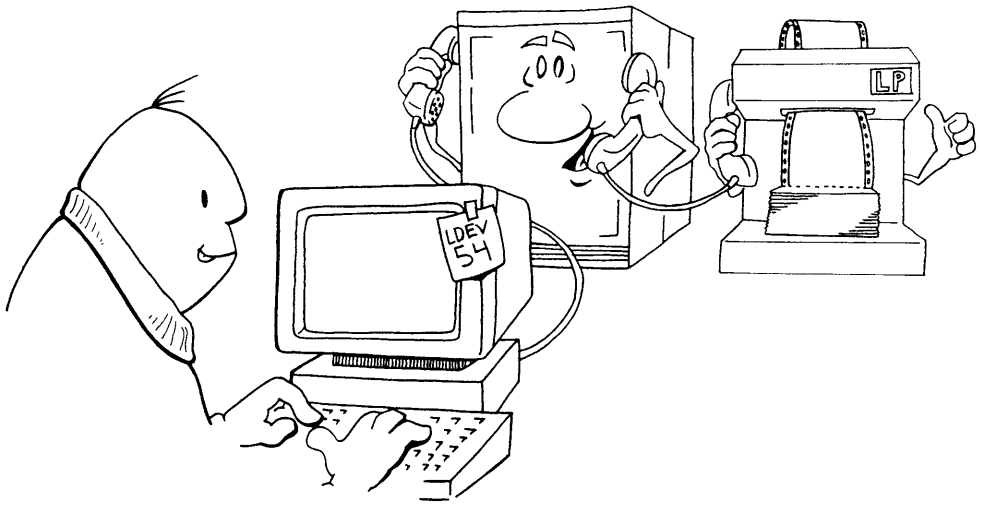
(substitute a session number ↑ from your screen for "nnn")

If the person is printing something, the computer describes two types of output:

- The information displayed on their terminal. Anyone conducting a session has one output device "OPENED", or in use, because that's where the computer sends information and messages.
- The printed report that the person asked for. For example:

```
DEV/CL    DFID     JOBNUM   FNAME     STATE FRM SPACE RANK PRI #C

54        #016     #S257    $STDLIST  OPENED
LP        #05925   #S257    LP        READY       2048      8   1
```

(and some other information)



How Reports Are Uniquely Identified

Type: SHOWOUT,SP Return

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C

LP       #05875  #S111   $STDLIST ACTIVE      2048      8   1
LP       #05876  #S12    $STDLIST OPENED      2048      8   1
SERIALP  #05925  #S257   LP       OPENED      2048      8   1
LP       #05635  #J26    $STDLIST READY        100    D 5   1
SERIALP  #05509  #J23    $STDLIST READY        172    D 3   1
PP       #05835  #S32    LISTOP   OPENED      2048    D 0   1
          ↑ (this is the letter "O", for "Output")
```

The second column in this example and on your screen lists the device file identification number of each spool file. No two spool files have the same device file ID. To find out information about a specific report, pick a device file ID number from your list:

Type: SHOWOUT,#Onnnn Return

(this is the letter "O", not zero) ↑ ↑ *(substitute a number from your screen)*

IMPORTANT

If you mistype the number, or type a zero instead of the letter "O", the computer tells you that "ONLY OUTPUT DEVICE FILES ARE APPROPRIATE". Retype the SHOWOUT command, making sure that you use the letter "O".

The computer responds with information about this specific report. For example:

```
:SHOWOUT #Onnnn
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE RANK PRI #C

LP       #Onnnn  #S257   LP       OPENED      2048      8   1

OUTFENCE = 6
```

Messages About Your Printer

Since the spooler manages the flow of reports to and from the printer, the printer seldom requires attention. If there's a problem, or if you're needed to keep things running smoothly, the computer sends a message to the Console.

As you've seen, Console messages are cryptic. Furthermore, it is very difficult to predict what sort of messages will appear frequently on your Console since each computer system is set up and used differently.

"LDEV NOT READY" messages, briefly discussed in the first chapter, are the most common printer-related messages. Anytime you or the computer stops the printer, you'll see one:

```
11:03/45/ LDEV nn NOT READY
                  ↑ (the logical device number of your printer)
```

You can stop the printer anytime by pressing the ONLINE, OFFLINE, or HALT button.

IMPORTANT

If your printer isn't manufactured by Hewlett-Packard, it may not have any of these buttons. It's also possible to stop it without seeing an "LDEV NOT READY" message on the Console.

Your computer stops the printer when it discovers a problem that affects how reports are produced. The Console message won't report the specific problem. So, if you see an LDEV NOT READY message for your printer, do one or more of the following to figure out the problem:

- Check the printer itself for any messages.
- Check for obvious problems, like jammed paper, or if the printer's run out of paper completely.
- Make sure the printer is online.

Three other messages that you may encounter, and the steps you'll take to respond to them, require a thorough knowledge of the spooler and the printer. These messages, listed below, are explained in "Advanced Topics" at the end of this chapter.

- Requests to mount special paper forms.
- "UNABLE TO ALLOCATE $STDLIST" messages.
- "SPOOFLE I/O ERROR" messages.

When You Should Intervene: Managing the Spooler

Most of the time, the spooler can supervise the printing process without any assistance. You may intervene occasionally to do any of the following tasks:

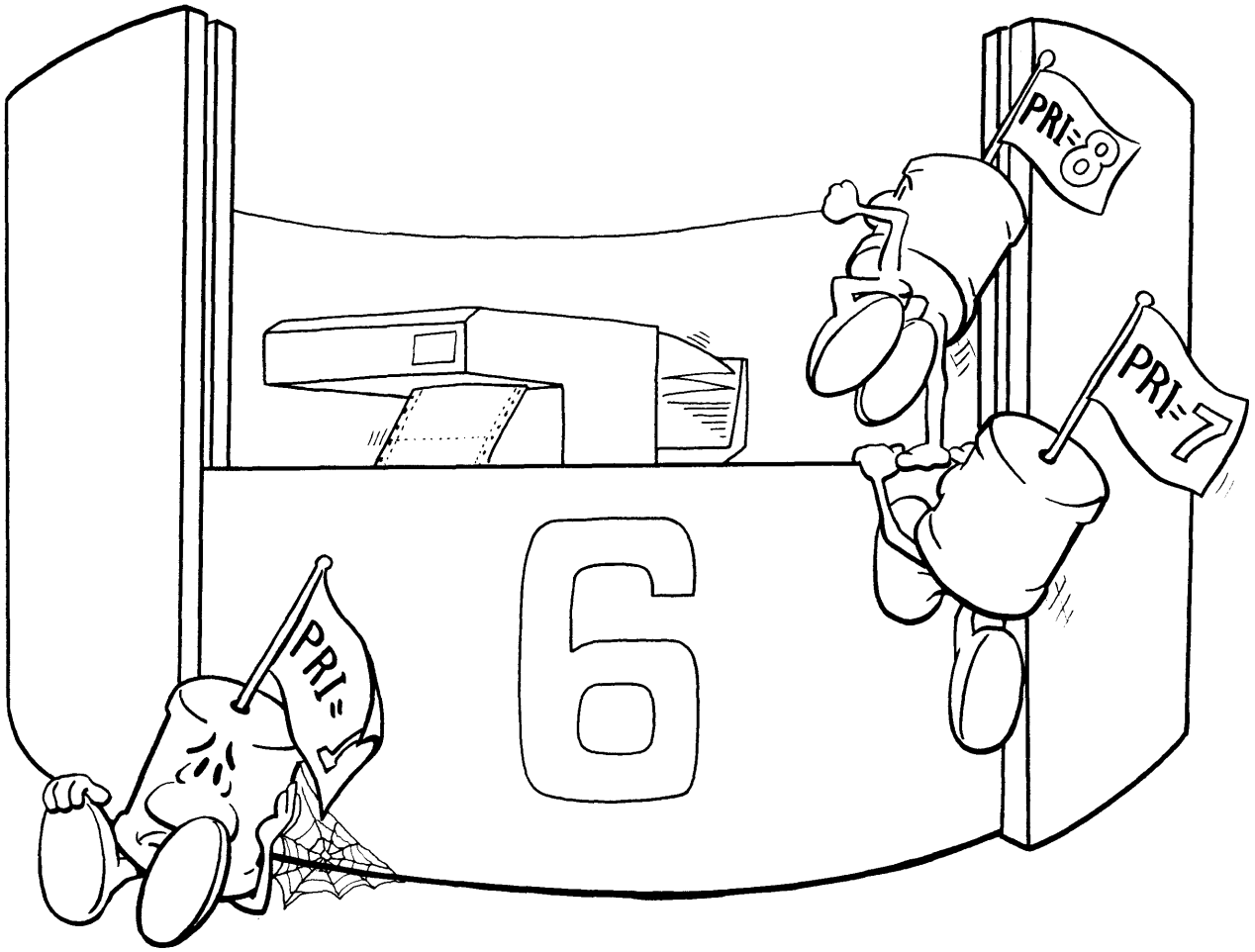
- Prevent one or more reports from being printed.
- Change the order in which reports are printed.
- Print one report ahead of the others.
- Delete a spool file before the report is printed.
- Clear a backlog of reports.
- Redirect a report to another printer.
- Print more than one copy of a report.

Two factors control which reports are printed: the "output priority" assigned to a report and the "outfence". Anyone can assign their own report a priority between 1 and 13. Once it's ready for printing, you can reset the report's priority.

The computer uses output priorities to determine the order in which spool files are printed. For example, a spool file assigned an output priority of 10 will be printed before one assigned an output priority of 9. Neither will be printed if the outfence is 10 or greater.

What's The Outfence?

The outfence is exactly what it sounds like: it's a barrier that keeps some reports from being printed. You set the outfence to any number between 1 and 14. To be eligible for printing, a spool file's priority must exceed the outfence.



This should sound familiar. The outfence, which controls printing, and the jobfence, which controls job processing, work on the same principle.

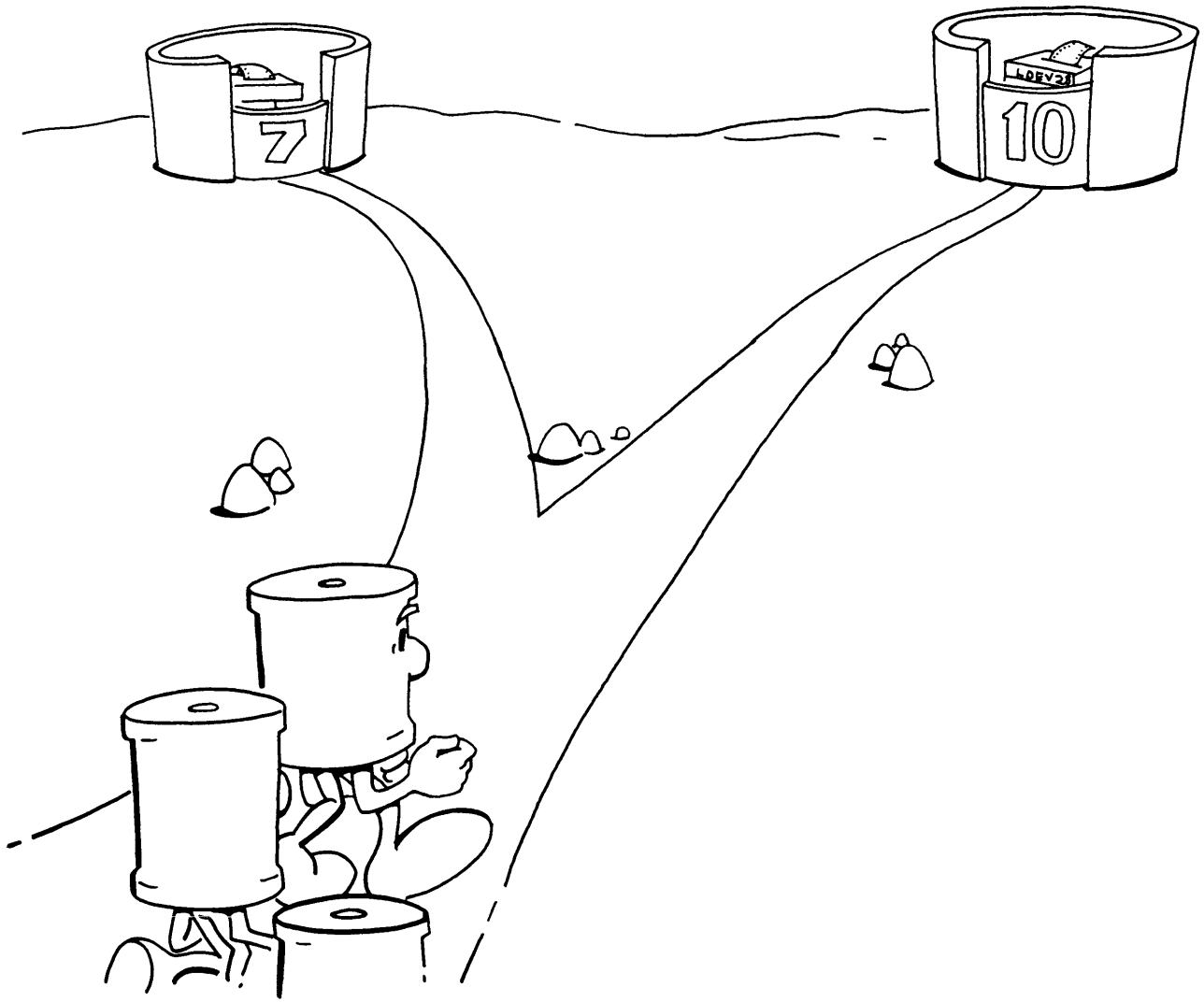
To check your outfence, type: **SHOWOUT STATUS** Return

```
11 FILES:
     0 ACTIVE
     0 READY; INCLUDING 0 SPOOFLES, 0 DEFERRED
     11 OPENED; INCLUDING 3 SPOOFLES
     0 LOCKED; INCLUDING 0 SPOOFLES
     3 SPOOFLES:  6144 SECTORS
OUTFENCE = 6
           ↑ (your outfence may be different)
```

If a single outfence is listed on your Console, as it is in the example above, then a single, system-wide outfence regulates printing for every shared printer. You may see something like this, though:

```
:SHOWOUT STATUS (what you typed)
11 FILES:
     0 ACTIVE
     0 READY; INCLUDING 0 SPOOFLES, 0 DEFERRED
     11 OPENED; INCLUDING 3 SPOOLFLES
     0 LOCKED; INCLUDING 0 SPOOFLES
     3 SPOOFLES:  6144 SECTORS
OUTFENCE = 6
OUTFENCE = 10 FOR LDEV 28
```

In the second example, a separate outfence is set for LDEV 28. To be printed, reports sent to LDEV 28 must be assigned a priority of 11 or higher. Reports sent to all other printers need priority of 7 or higher to be printed.


7
10

In the next few pages, you will reset the system outfence and any outfences that apply to individual printers. Before you begin experimenting, write down the current outfence values that appear on your screen:

System Outfence = _____

Outfence for LDEV _____ = _____

Outfence for LDEV _____ = _____
↑ *(record your printers' LDEV numbers in these spaces)*

Using Input Priorities And The Outfence To Control Printing

The outfence is used in the following way:

- Reports are assigned an output priority of 8 when they are sent to the printer unless the user requests a higher or lower priority.
- The report is eligible for printing when the spool file is ready and its priority exceeds the outfence.
- If the output priority is less than or equal to the outfence, the report won't be printed until the outfence is lowered or the report's priority is raised.
- Reports assigned a priority of 0 or 1 can only be printed if you raise their priority, since you can only lower the outfence to 1.

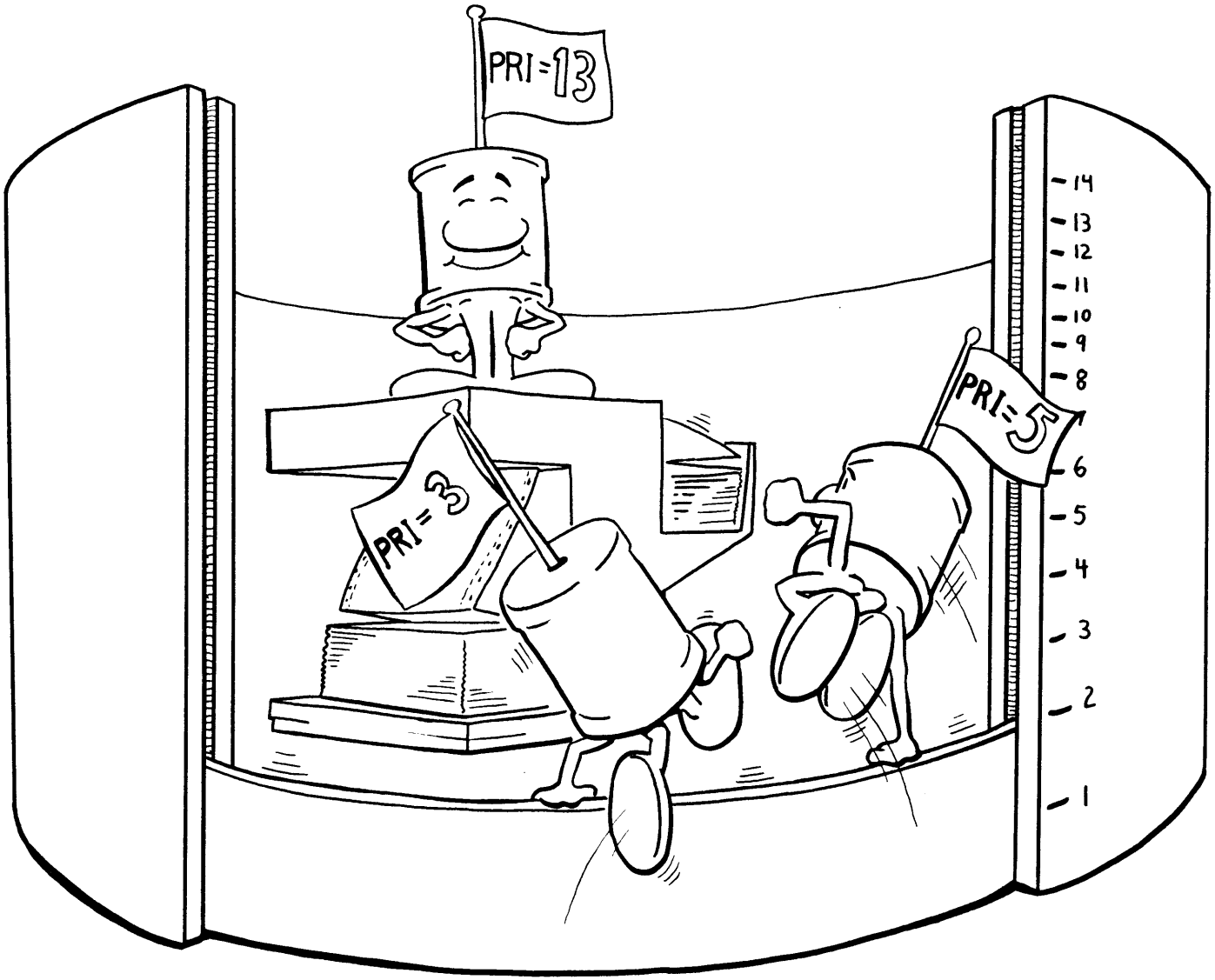
Lowering The Outfence

To print reports assigned low output priorities, lower the outfence. For example, to set the outfence to 2,

type: OUTFENCE 2 Return

Check it by typing: SHOWOUT STATUS Return

The new system outfence is listed in the last line on your screen (unless separate outfences are set for individual printers). Any separate outfences remain the same, listed below the new system outfence.


PRI=13
PRI=3
PRI=5
14
13
12
11
10
9
8
6
5
4
3
2
1

To lower the outfence for just one printer, substitute its LDEV number for "nn" in the next command:

type: OUTFENCE 2;DEV=nn Return

Raising The Outfence

Raising the outfence to its maximum value, 14, prevents the printing of all reports.

Type: OUTFENCE 14 Return

Type: SHOWOUT SP Return

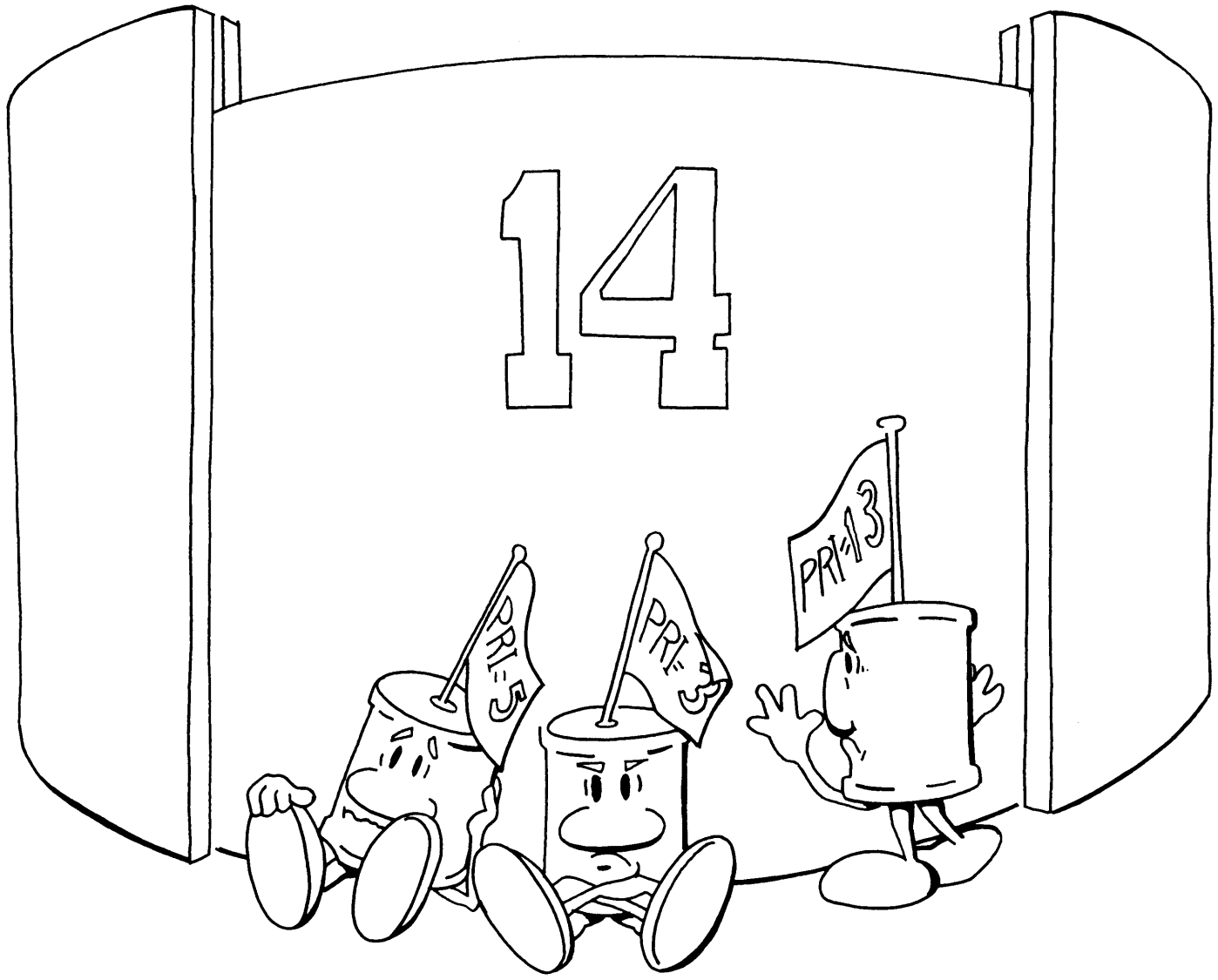
The list looks a little different. In particular:

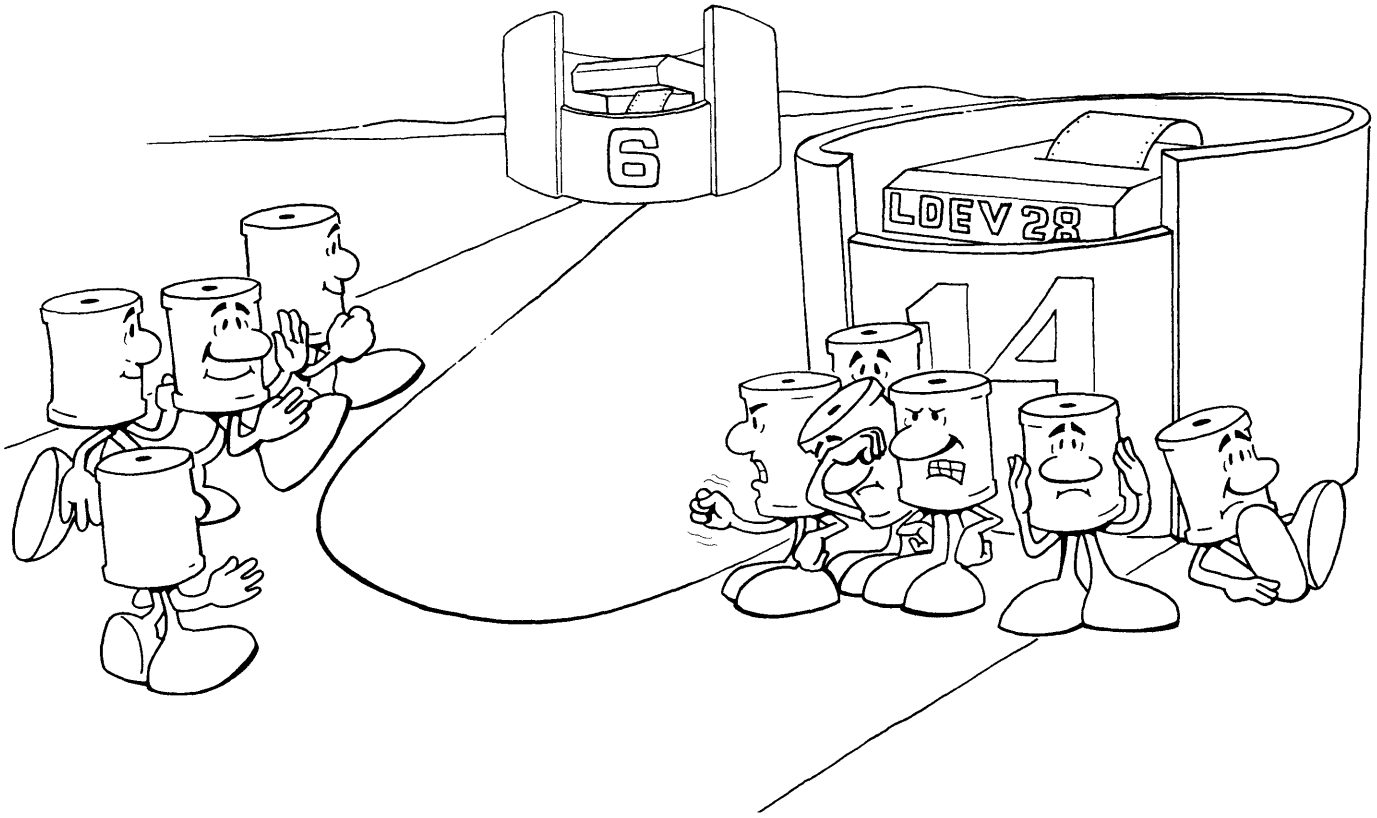
- The last line of information tells you that the outfence is 14.
- A "D" appears in the RANK column for each spool file listed, regardless of its ouput priority, like this:

```
DEV/CL    DFID     JOBNUM   FNAME     STATE FRM SPACE RANK PRI #C
LP        #05875   #S111    $STDLIST  OPENED      2048    D 8   1
LP        #05876   #S12     $STDLIST  OPENED      2048    D 8   1
SERIALP   #05925   #S257    LP        READY       2048    D 8   1
PP        #05835   #S32     LISTOP    WAIT        2048    D 0   1
                                    (this means they're deferred) ↑
```

You can prevent anyone from printing reports on one printer by setting a separate outfence for it. Other printers, controlled by the system-wide outfence, won't be affected.

Type: OUTFENCE 14;LDEV=nn Return
↑ *(use the printer's LDEV number)*


14
PRI=13
PRI=3
PRI=3



Before continuing, reset the outfences to their original value, using the numbers from page 4-36:

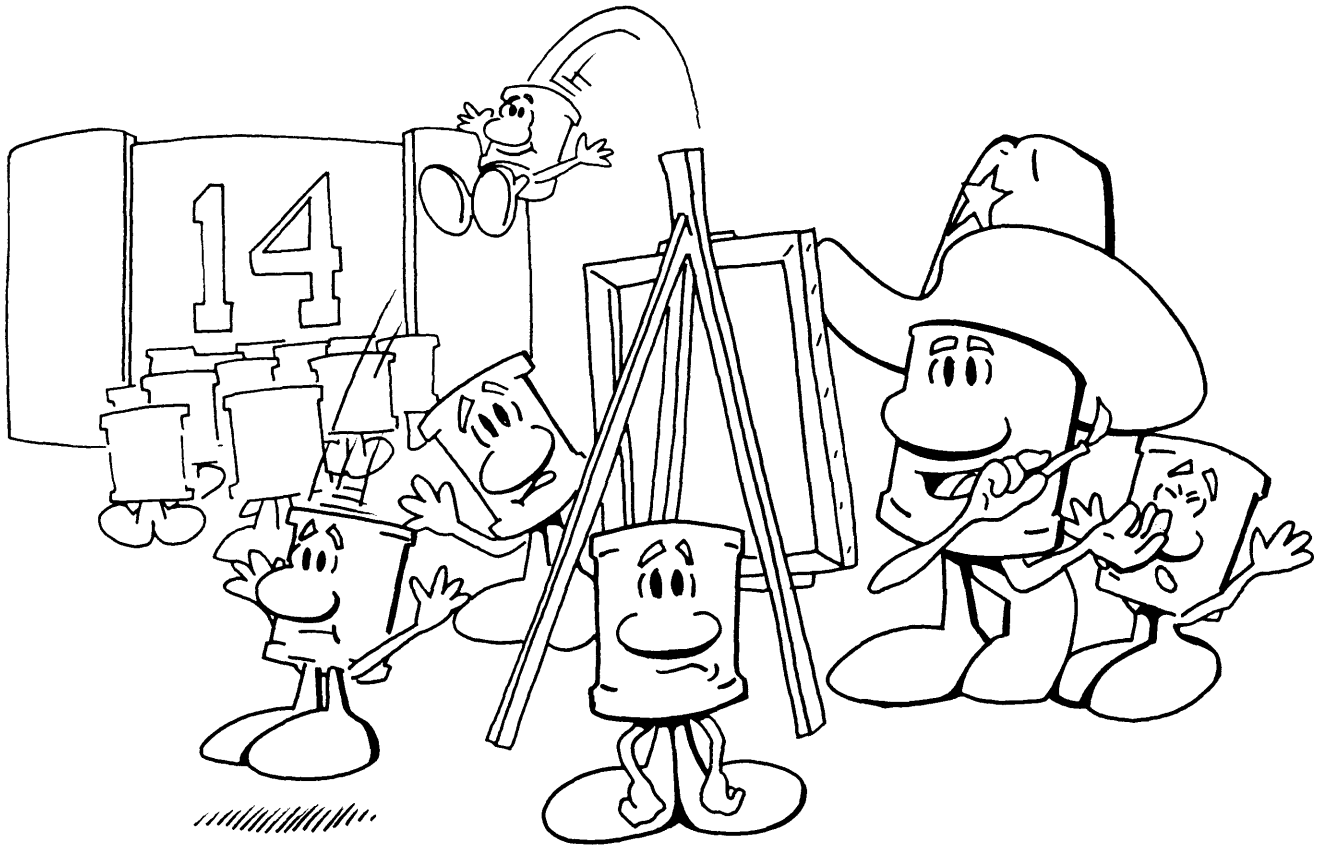
Type: `OUTFENCE nn` Return

Type: `OUTFENCE nn;LDEV=nn` Return

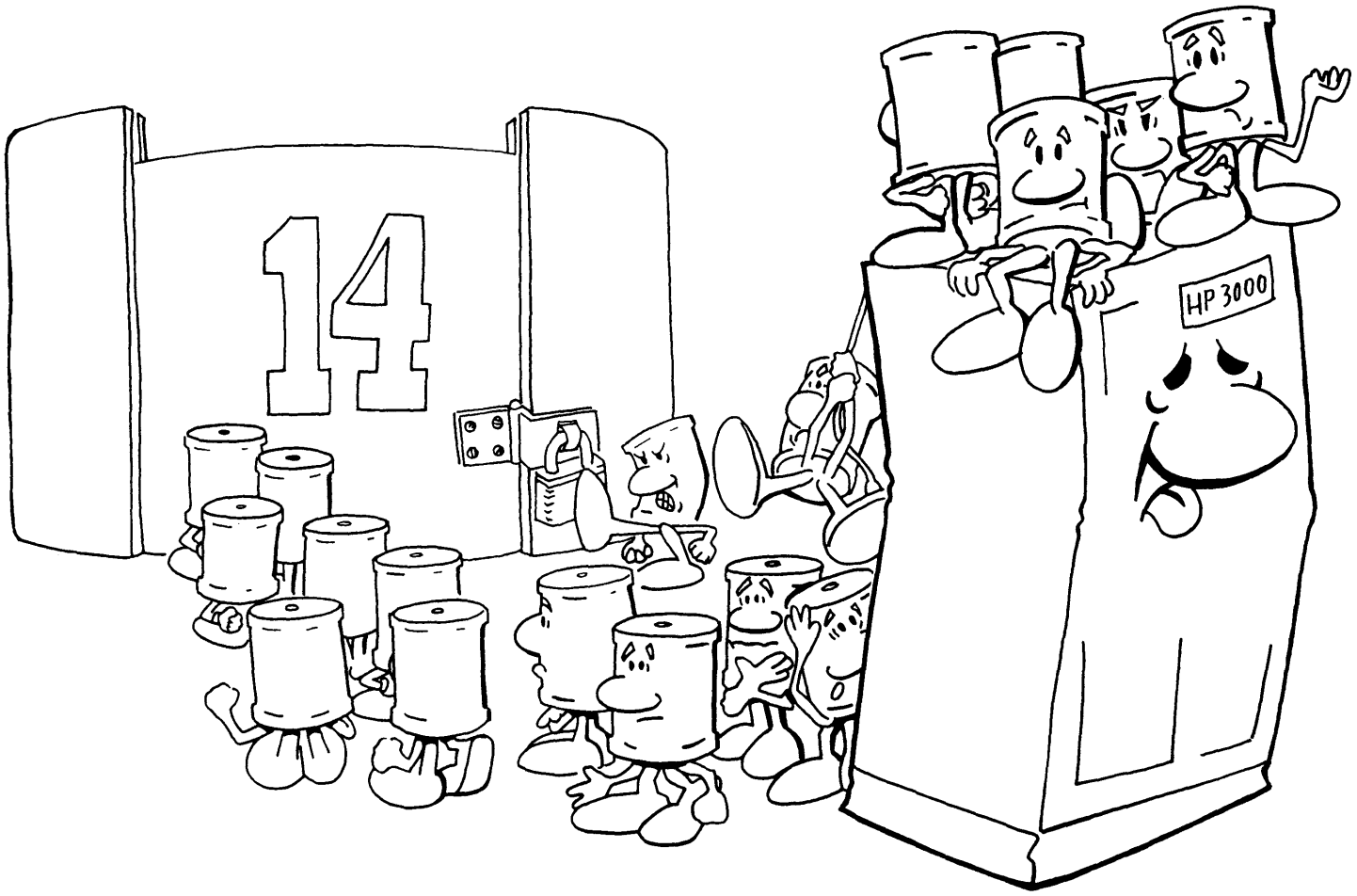
↑ *(the printer's LDEV number)*

Stopping All Printing Activity

Even if the printer is stopped or the outfence is set to 14, people can still "print" reports. That's because the spooler will continue to create spool files, storing them on your computer's disc, unless it's interrupted.

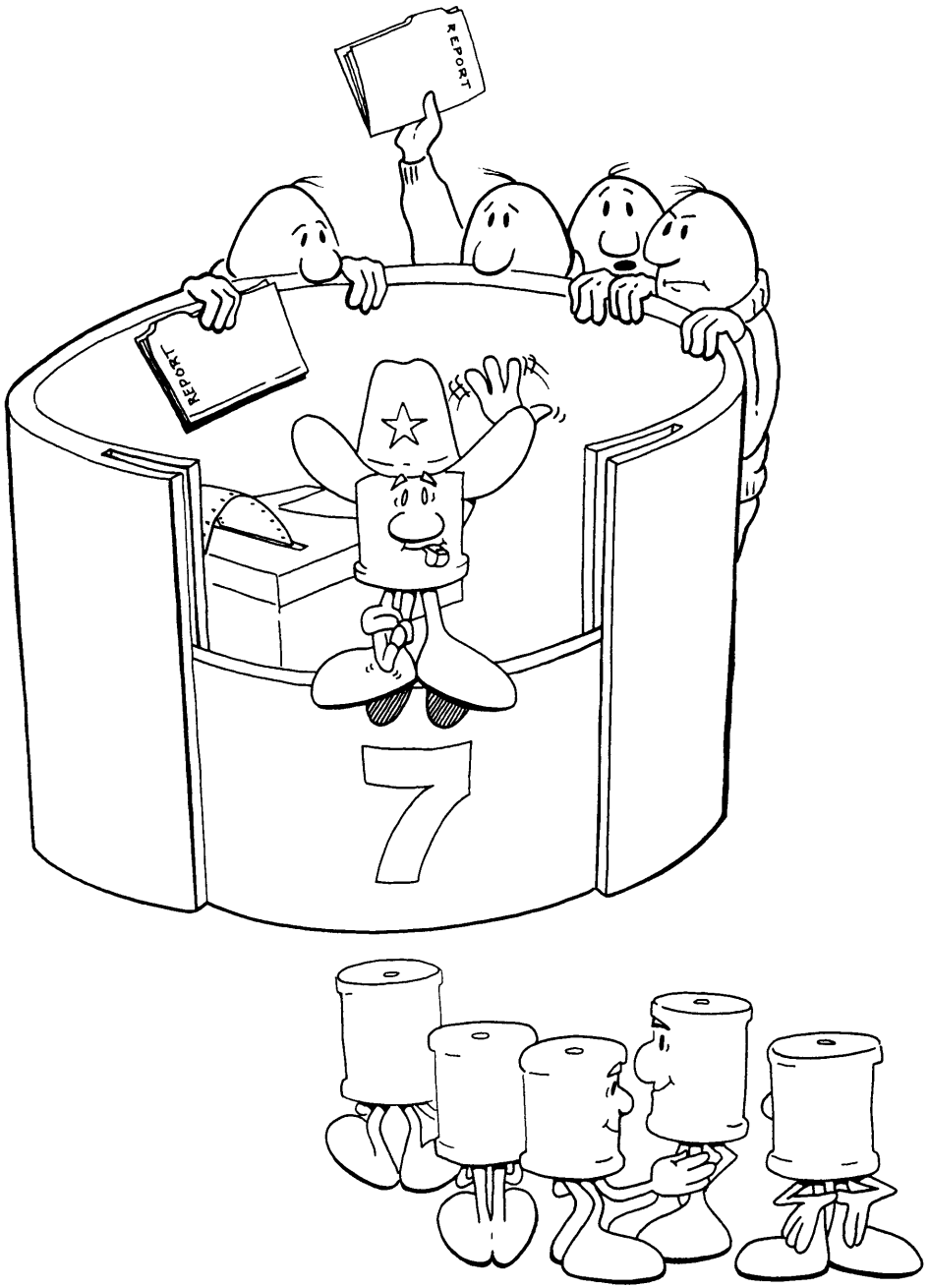


But you only have a limited amount of space to store spool files. If too many accumulate, it could cause a system failure.



To prevent this from happening, you can stop the spooler, or suspend it, which stops it temporarily.

You can also shut the spool "queue", which is where spool files accumulate until they're printed. Shutting the spool queue prevents users from sending reports to the printer, but won't interrupt the printing of existing spool files. In this way, you can clear a backlog of spool files.


REPORT
REPORT
7

Follow Steps One through Five, below, to prevent people from printing reports.

Step One: Prevent The Printing Of Existing Spool Files

Type: `SHOWOUT_STATUS` Return

The last line(s) of information tell you the system outfence, and any separate outfences set for specific printers.

If a single, system-wide outfence is listed, change it to 14. This way, all reports that have already been submitted to the printer won't be printed.

Type: `OUTFENCE_14` Return

If you also see individual outfences listed, use the LDEV numbers that appear on your Console to reset the outfence for each printer.

Type: `OUTFENCE_14;LDEV=nn` Return

↑ *(use your printer's LDEV number)*

Repeat this command until you have reset all outfences to 14. To check the new outfence values,

type: `SHOWOUT_STATUS` Return

Step Two: Shut The Spool Queue

Type: SHOWDEV nn Return
↑ *(use your printer's LDEV number)*

```
LDEV      AVAIL      OWNERSHIP      VOLID          DEN     ASSOCIATION
nn        SPOOLED    SPOOLER OUT
 ↑ (your printer's LDEV number)
```

"SPOOLED" tells you that the spool queue is open, and the printer is accepting new reports. To prevent people from sending new reports to the printer,

type: SHUTQ nn Return
↑ *(use your printer's LDEV number)*

If the colon prompt returns to your screen, and no other message appears on the Console, use the next command to check the printer again. Is it still available?

Type: SHOWDEV nn Return
↑ *(use your printer's LDEV number)*

Using the SHUTQ command, shut the spool queue for each system printer, then skip to Step Four.

IMPORTANT

If you're told that SHUTQ is an "UNKNOWN COMMAND NAME", you must stop the spooler to shut the spool queue. To do so, continue with Step Three, on the next page.

Step Three: Another Way To Shut The Queue

For each printer connected to your computer,

type: SUSPENDSPOOL nn Return
↑ *(use your printer's LDEV number)*

When the spooler is suspended, you'll see this message:

```
16:39/23/SP#nn/SUSPENDED
              ↑ (the LDEV number of your printer)
```

But, if the computer tells you that the "SPOOLER PROCESS IS BUSY", repeat the SUSPENDSPOOL command a few times.

Once it's suspended, type: STOPSPOOL nn Return
(the LDEV number of your printer) ↑

When the spooler stops, you'll see this message on the Console:

```
16:39/23/SP#nn/STOPPED
              ↑ (the LDEV number of your printer)
```

If neither the SUSPENDSPOOL or STOPSPOOL commands work, check to see if there are any reports being printed right now.

Type: SHOWOUT ACTIVE Return

Keep checking until the computer tells you that there are "NO SUCH FILES". (This should happen pretty soon, since you just raised the outfence to prevent the printing of new reports.) When there are no active spool files,

type: ABORTIO nn Return
↑ *(the LDEV number of your printer)*

Repeat the ABORTIO command until the computer tells you that there is "NO I/O TO ABORT" for that printer. Then repeat the STOPSPOOL command.

You now can do one of two things:

- Restart the spooler, but keep the spool queue shut. The printer will resume printing any existing spool files, but no new reports will be accepted. To do this, skip to Step Five, "Clear The Backlog Of Reports".
- Take the printer "down", which will make it unavailable to everyone. To do this, continue with the next step:

Step Four: Make The Printer Off Limits

You can control whether or not any device is available to computer users with two commands: UP and DOWN. When you issue the DOWN command for your printers, no one will be able to use them.

IMPORTANT

Taking the printer down isn't absolutely necessary to prevent people from printing reports. Steps One and Two suffice.

Substitute your printer's LDEV number for "nn" in the next two commands:

Type: DOWN nn Return

Type: SHOWDEV nn Return

If you succeeded in taking the printer "down", you'll see this information on your Console:

```
LDEV      AVAIL      OWNERSHIP      VOLID          DEN     ASSOCIATION
nn        UNAVAIL    DOWN
↑ (your printer's LDEV number)
```

Repeat the DOWN command for each printer, then check the status of each one with the SHOWDEV command.

Step Five: Clear The Backlog Of Reports

Type: SHOWOUT SP Return

If you get a long list of spool files, you should print them, or copy them onto a tape to print later. (For instructions about copying them onto tape, refer to "Creating A SPOOK Tape" on page 4-87.) To print them now, substitute your printer's LDEV number for "nn" when you type the commands below:

Type: SHOWDEV nn Return
↑ *(use your printer's LDEV number)*

If the computer tells you the printer is "DOWN", you must bring it back "up" before you can start the spooler to print the backlog of reports:

Type: UP nn Return
↑ *(use your printer's LDEV number)*

Type: STARTSPOOL nn;SHUTQ Return
↑ *(use your printer's LDEV number)*

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

```
16:45/54/SP#nn/SPOOLER OUT
            ↑ (your printer's LDEV number)
```

Repeat this command for each printer connected to your computer. If you'd like, check the status of each printer after you've brought it back "up" using the SHOWDEV command:

Type: SHOWDEV nn Return

```
LDEV      AVAIL      OWNERSHIP      VOLID          DEN     ASSOCIATION
nn        UNAVAIL    SPOOLER OUT
```

↑ *(the spooler has been started)*

(the spool queue is shut)

(your printer's LDEV number)

IMPORTANT

If the computer responds to either of the UP or STARTSPOOL commands by telling you that the "DEVICE IS OWNED BY ANOTHER PROCESS",

type: ABORTIO nn Return

↑ *(your printer's LDEV number)*

Repeat this command until the computer tells you that there's "NO I/O TO ABORT". Then try the UP and STARTSPOOL commands again.

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

Type: OUTFENCE 1 Return

If invidividual outfences are set for each printer, repeat the next command for each:

Type: `OUTFENCE 1;LDEV=nn` Return
↑ *(use your printer's LDEV number)*

Check the list periodically to find out how many spool files remain:

Type: `SHOWOUT,SP` Return

If some of the reports have been assigned the lowest priority, decide whether or not you want to print them. If you do, raise their output priority to 8 by following the instructions for "Raising The Priority Of All Reports With One Command", on page 4-63.

When the computer tells you that there are "NO SUCH FILES", they've all been printed.

Handling A Rush Job: Printing A Report Right Now

Typically, each report waiting to be printed has the same importance, or priority, as the others. As a result, reports are printed on a "first come, first served" basis. You can, however, make sure one report is printed ahead of the others by raising its priority. The steps below show you how.

Step One: Send A Report To The Printer

Type: `SHOWOUT,SP` Return

Check the FNAME column to see if the report you sent to the printer earlier, OPREPORT, is still listed. If it is, skip to Step Two. If not, send a report to the printer that you can experiment with. To do so, follow the directions in "Step One: Command The Computer To Print A Report", on page 4-15.

Step Two: Check Your Report's Status

Type: SHOWOUT SP Return

```
DEV/CL   DFID    JOBNUM  FNAME     STATE FRM SPACE RANK PRI #C

LP       #05875  #S111   $STDLIST  READY       2048       8   1
LP       #05876  #S12    $STDLIST  READY       1096       7   1
LP       #0nnnn  #Snnn   OPREPORT  READY       100      D 1   1
```

↑ *(your report)*

(the device file identification number; check your screen)

(where OPREPORT will be printed)

Step Three: Prevent Other Reports From Being Printed

Type: SHOWOUT STATUS Return

If a single, system outfence is displayed on your Console, raise it to 13. This prevents all but the highest-priority reports from being printed.

Type: OUTFENCE 13 Return

Check the description of OPREPORT to find out where it will be printed. If a separate outfence is set for that printer, raise its outfence.

Type: OUTFENCE 13;LDEV=nn Return

↑ *(use the LDEV number of OPREPORT's printer)*

Step Four: Raise Your Report's Priority

Use the device file identification number you found in Step Two to raise your report's priority.

Type: ALTSPOOLFILE #Onnnn;PRI=14 Return
(the letter "O", not zero) ↑ ↑ (the device file ID)

Type: SHOWOUT SP Return

If your report isn't listed as "ACTIVE" yet, it should be soon. Once it's finished printing, lower the outfence to its original value:

Type: OUTFENCE nn Return
↑ (use your original outfence)

If separate outfences are set for individual printers, lower them to their original values:

Type: OUTFENCE nn;LDEV=nn Return
(the original outfence for ↑ that printer) *↑ (your printer's LDEV number)*

Printing Reports In A Specific Order

By adjusting the priority of a series of reports, you can make sure that the computer prints them in a specific order. You can't alter spool files that are still listed as "OPENED", but you can rearrange the order of those that are ready to be printed.

To learn how to change printing priorities, start by sending three reports to the printer.

Step One: Send Three Reports To The Printer

You've used the directions on page 4-15 to send a report to the printer a few times already. That's the basic procedure you'll use, so it's explained only briefly below. This time, though, you'll end up with three reports, each with a slightly different file name so that you can easily find them in a complete list of spool files.

The process begins with the FILE command. You use it to name your spool file and to assign it the lowest priority, 1, so that you'll have enough time to adjust the printing order of all three reports.

Type: FILE REPORT1;DEV=LP,1 Return
(the name of your spool file) ↑ ↑ *(the output priority)*

1. Type: EDITOR *REPORT1 Return
2. At the Editor prompt, type: TEXT MYJOB Return
3. Then type: LIST ALL,,OFFLINE Return
4. When the Editor tells you that the offline listing has begun and you see the prompt again,

   type: EXIT Return

You've just sent a report, named "REPORT1", to the printer. To list it along with any others that are waiting to be printed,

type: SHOWOUT SP Return

To send a second report to the printer, begin with the FILE command again. This time, give your report a different name.

Type: FILE REPORT2;DEV=LP,1 Return
(the name of your second spool file) ↑ ↑ *(the output priority)*

Repeat the commands numbered 1 through 4.

Once you've created a second spool file named "REPORT2", ask the computer to list unprinted reports. REPORT2 should be listed below REPORT1:

Type: SHOWOUT SP Return

```
:SHOWOUT SP (what you typed)
DEV/CL    DFID     JOBNUM   FNAME     STATE FRM SPACE RANK PRI #C
LP        #Onnn    #Snnn    REPORT1   READY       100      D 1   1
LP        #Onnn    #Snnn    REPORT2   READY       100      D 1   1
                                                (the output priority) ↑
```

Begin the process a third (and last!) time:

Type: FILE REPORT3;DEV=LP,1 Return

(the name of your third spool file) ↑ ↑ *(the output priority)*

Repeat the commands numbered 1 through 4. Then, check for a spool file named "REPORT3"; it should be listed below REPORT2.

Type: SHOWOUT SP Return

```
:SHOWOUT SP (what you typed)
DEV/CL    DFID     JOBNUM   FNAME     STATE FRM SPACE RANK PRI #C
LP        #Onnn    #Snnn    REPORT1   READY       100      D 1   1
LP        #Onnn    #Snnn    REPORT2   READY       100      D 1   1
LP        #Onnn    #Snnn    REPORT3   READY       100      D 1   1
↑ (where your reports will be printed)              (the output priority) ↑
```

IMPORTANT

Note the device file identification numbers in the second column. You'll use them to change each report's priority.

Step Two: Put A Hold On Printing

If you were changing the printing order of three existing reports, you would begin with this step. That's because most reports are sent to the printer with a priority of 8, and the outfence is usually 7 or less, which makes the reports eligible for printing as soon as they're "READY". To allow enough time to change their priorities, put a hold on all printing.

Type: `OUTFENCE 14` Return

Or, if individual outfences are set, raise them to 14:

Type: `OUTFENCE 14;LDEV=nn` Return

↑ *(your printer's LDEV number)*

Step Three: Change The Priorities

Change the priority of all three reports so that they're printed in the reverse order in which they're listed. (The listed order is the order in which you commanded the computer to print the job file.)

Change the priority of REPORT3 to 11.

Type: `ALTSPOOLFILE #Onnnn;PRI=11` Return

(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT3)*

Change the priority of REPORT2 to 10.

Type: `ALTSPOOLFILE #Onnnn;PRI=10` Return

(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT 2)*

Change the priority of REPORT1 to 9.

Type: `ALTSPOOLFILE #Onnnn;PRI=9` Return

(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT1)*

Ask the computer for a list of reports that are ready to print. Yours will be listed among them.

Type: SHOWOUT READY Return

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE  RANK  PRI #C
LP       #Onnnn  #Snnn   REPORT3  READY       100     D 11   1
LP       #Onnnn  #Snnn   REPORT2  READY       100     D 10   1
LP       #Onnnn  #Snnn   REPORT1  READY       100     D  9   1
```

Step Four: Print The Reports

Even though you changed their priorities, the three reports remain deferred so long as the outfence is set to 14. Reset the outfence to its original value so that these, and the other reports sent to that printer, can be printed.

Type: OUTFENCE nn;LDEV=nn Return

(the original outfence; ↑ check page 4-38) *↑ (use your printer's LDEV number)*

Type: SHOWOUT SP Return

If REPORT3 has the highest priority of all spool files, it will be "ACTIVE" now. Or, if you don't see it listed, it's already finished. (These are small reports!)

```
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE  RANK  PRI #C
LP       #Onnnn  #Snnn   REPORT3  ACTIVE      100        11   1
LP       #Onnnn  #Snnn   REPORT2  READY       100        10   1
LP       #Onnnn  #Snnn   REPORT1  READY       100         9   1
                (this report is printing)          (none are deferred) ↑
```

Deleting A Spool File Before The Report Is Printed

If you decide not to print a specific report, you can delete it from the queue while it's waiting to be printed. The report must be listed as "READY"; you can't get rid of a spool file that's "OPENED".

The steps below take you through an example of how to delete a report. Follow them now to familiarize yourself with the process, or refer to them later when the need arises.

IMPORTANT

You can also delete the "ACTIVE" report before it's completely finished printing. For instructions, refer to page 4-69.

Step One: Send A Report To The Printer

Follow the directions on page 4-15 to send a single report to the printer. Use the name "REPORT1", as you were instructed to do when you created the first of three spool files.

Step Two: List All Unprinted Reports

Type: SHOWOUT SP Return

Find your report's identification number in the DFID column. You'll use it to delete the report in the next step. If the spool file is "READY", go on to Step Three. If it isn't, wait a few seconds, then

type: SHOWOUT #0nnnn Return
(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT1)*

The computer describes just REPORT1, and not the other spool files. When it's listed as "READY", go on to Step Three.

Step Three: Delete The Spool File

Type: DELETESPOOLFILE #0nnnn Return
(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT1)*

Step Four: Check For Your Report

Type: SHOWOUT SP Return

Since you just deleted REPORT1, it won't be listed with the other reports waiting to be printed. Another way you could verify that REPORT1 was deleted is to ask the computer specifically about it.

Type: SHOWOUT #0nnnn Return
(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT1)*

If you've successfully deleted REPORT1, the computer will tell you that it finds "NO SUCH FILE(S)".

Putting Reports On Hold

As you've seen, raising the system outfence to its maximum, 14, puts all reports on hold. People can still send reports to the printer, and spool files will continue to be created and added to the list, but nothing will be printed.

Another way to put reports on hold is to leave the outfence alone, but lower the reports' output priority. You can do this for individual reports, or for all reports with a single command.

Deferring Reports One At A Time

To defer a report, it must be listed as "READY" to print. Also, you need to know its device file identification number.

The first way to defer a report is to lower its priority to the a value less than or equal to the outfence.

Type: ALTSPOOLFILE #0nnnn;PRI=0 Return

↑ *(use your report's device file identification number)*

The second way to defer a report is this:

Type: ALTSPOOLFILE #0nnnn;DEFER Return

↑ *(use your report's device file identification number)*

This has the same effect as explicitly assigning the report an output priority of 0. In both cases, the report will wait to be printed until you raise its priority. Lowering the outfence will have no effect since the minimum outfence is 1.

A third way to defer a report is to lower its priority to a number less than the current outfence. For example, if your outfence is 6, you could assign the report an output priority of 6 or less. To assign it a priority of 2,

type: ALTSPOOLFILE #0nnnn;PRI=2 Return

↑ *(use your report's device file identification number)*

To print the report, you can either lower the outfence to 1, or raise its priority to a number greater than the current outfence.

To list the reports that are ready for printing, but deferred,

type: SHOWOUT READY,D Return

Deferring All Reports With One Command

If you're assigned OP capability, you can use part of a special "utility program" called SPOOK to defer all reports with one command. (To check your capabilities, look at the list you recorded on page 1-2.)

Type: RUN SPOOK5.PUB.SYS Return

If you're using an early version of the operating system, you may see this message:

```
PROGRAM FILE SPOOK5.PUB.SYS NOT FOUND.  (CIERR 622)
```

If you do, type: RUN SPOOK.PUB.SYS Return
(don't add the "5")

The program begins by identifying itself and printing a special ">" prompt on the screen:

```
SPOOK5 G.01.00  (C) HEWLETT-PACKARD CO., 1983
>_
```

IMPORTANT

The special prompt means that most of the commands you've been using won't work and a new set is available to you. More important, to return to the colon prompt, you must end the SPOOK program.

To lower the output priority of all spool files to 1,

type: ALTER @.@;PRI=1 Return
↑ *(spool files belonging to all users in all accounts)*

To end SPOOK, type: EXIT Return

You'll see the message "END OF PROGRAM", and then the colon prompt will be reprinted on your screen.

Making Sure Reports Get Printed

If the printer hasn't printed a report that you need, ask the computer for a list of all spool files:

Type: SHOWOUT.SP Return

Find your report in the list and check the following three things:

- Is the spool file still "OPENED"?
- Is the outfence set to the maximum value, 14?
- Is the report's output priority lower than the outfence?

Any one of these things will prevent your report from being printed. The first you can't do anything about; the other two, you can.

If the spool file is still "OPENED", you'll need to wait for it to become "READY". If a lot of people are using the computer, or the report is particularly large, it may take awhile for the computer to complete the spool file.

Printing One Report: What Are Your Options?

If the outfence is set to 14, you can do one of two things:

- Lower it a little, for example to 12, then raise the priority of your report to 13. This way, other reports assigned priorities of 12 or lower will remain on hold, but yours will be printed.

  To lower the outfence, type: `OUTFENCE nn` Return
  (a number between 1 and 14) ↑

  To raise your report's priority,

  type: `ALTSPOOLFILE #Onnnnn;PRI=nn` Return
  (the letter "O", not zero) ↑ ↑ *(the device file ID number)* ↑ *(a number between 0 and 13)*

- Lower the outfence to a number less than the output priority of your report. Your report, and any others with a priority greater than the outfence, will be printed.

  To lower the outfence, type: `OUTFENCE nn` Return
  (a number between 1 and 14) ↑

  Check it by typing: `SHOWOUT STATUS` Return

Raising The Priority Of All Reports With One Command

If you're assigned OP capability, you can raise the priority of all reports at one time in the same way that you put all reports on hold. You'll use the ALTER command of the SPOOK utility program again. (To check your capabilities, look at the list you recorded on page 1-2.)

Type: `RUN SPOOK5.PUB.SYS` Return

If you're using an early version of the operating system, you may see this message:

```
PROGRAM FILE SPOOK5.PUB.SYS NOT FOUND.  (CIERR 622)
```

If you do, type: RUN SPOOK.PUB.SYS Return
↑ *(don't add the "5")*

```
SPOOK5 G.01.00  (C) HEWLETT-PACKARD CO., 1983
>_
```

To change the output priority of all reports to 10,

type: ALTER @.@;PRI=10 Return
↑ *(spool files belonging to all users in all accounts)*

To end SPOOK, type: EXIT Return

You'll see the message "END OF PROGRAM", and then the colon prompt will be reprinted on your screen.

Redirecting A Report To Another Printer

If your computer has just one system printer, skip this section and go on to "Requesting More Copies Of A Report", on page 4-68. But, if two or more system printers are connected to your computer, you can switch a report from one printer to another before it begins printing. Follow the steps below to learn how.

Step One: Send A Report To The Printer

Send a single report to the printer using the directions on page 4-15. Name it "REPORT1", as you were instructed to do when you created the first of three spool files.

Step Two: Check On Your Report

Type: **SHOWOUT SP** Return

Find your report's identification number in the DFID column. Use the number in the following command:

Type: **SHOWOUT #Onnnn** Return
(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT1)*

```
:SHOWOUT #Onnnn (what you typed)
DEV/CL    DFID     JOBNUM  FNAME     STATE FRM SPACE  RANK   PRI #C

LP        #Onnnn   #Snnn   REPORT1   READY       100          1   1

OUTFENCE = nn
```

The first column tells you the device class name or LDEV number of the printer that will print your report. If an LDEV number is listed, you can redirect the report to another printer following the directions in Step Four. If a device class name is listed, you need a little more information. Continue with Step Three.

Step Three: Find Out The Printer's LDEV Number

Substitute the device class name from your screen for "LP" in the following command:

Type: **SHOWDEV LP** Return
↑ *(use your printer's device class name)*

You'll get a description of one or more printers, listed by LDEV number. Each printer in the list shares that device class name ("LP" in the example above). When there's more than one printer listed, you can do one of two things:

- Redirect the report to one specific printer in the list, referring to it by LDEV number.
- Tell the computer to print the report on another printer that isn't listed, again referring to it by LDEV number.

Step Four: Switch Printers

Check the list of devices posted near your Console, or the printer information you recorded on page 1-2. (If you don't have this information, refer back to "Controlling Peripheral Devices From The Console" in Chapter One.) Find the LDEV number of a printer other than the one the report is destined for now. Using this LDEV number,

type: **ALTSPOOLFILE #Onnnn;DEV=nn** Return

(the device file ID of REPORT1) ↑ ↑ *(the LDEV number of the alternate printer)*

Step Five: Check The Report Again

Type: **SHOWOUT #Onnnn** Return

(the letter "O", not zero) ↑ ↑ *(the device file ID of REPORT1)*

```
:SHOWOUT #Onnnn (what you typed)
DEV/CL    DFID     JOBNUM  FNAME     STATE FRM SPACE  RANK  PRI #C

nn        #Onnnn   #Snnn   REPORT1   READY       100          1   1

OUTFENCE = nn
```

The first column lists the LDEV number of the alternate printer. That's where REPORT1 will be printed when you raise its priority. (Since you're going to use it again in the next section, leave it for now.)

LDEV 19
GO BACK
YOU ARE
GOING THE
WRONG
WAY.

Requesting More Copies Of A Report

The printer automatically creates one copy of a report, but you can request up to 127 copies. Take a look at the list of reports waiting for your printer(s), and check the last column.

Type: SHOWOUT SP Return

IMPORTANT

If you've just followed the instructions in the preceding section, one of the spool files in your list should be REPORT1. If not, go back to page 4-15 and send a report to the printer.

For example, to request four copies of REPORT1,

type: ALTSPOOLFILE #0nnnn;COPIES=4 Return
↑ *(the device file ID of REPORT1)*

Check it by typing: SHOWOUT #0nnnn Return

```
:SHOWOUT #0nnnn (what you typed)
DEV/CL   DFID    JOBNUM  FNAME    STATE FRM SPACE  RANK  PRI #C

nn       #0nnnn   #Snnn   REPORT1  READY       100          1   4
                                                (now four copies will be printed) ↑
OUTFENCE = nn
```

IMPORTANT

To print REPORT1, you must change its priority from 1 to a number greater than the outfence set for that printer. If you need a command example to do this, refer to 'Making Sure Reports Get Printed" on page 4-62.

Making Changes To The "Active" Report

In this chapter, you've learned that you may only alter reports that are ready to be printed. Strictly speaking, that's true. But by interrupting the printing process, you can defer the report that's listed as "ACTIVE", then alter it. (Deferring it changes the report's state from "ACTIVE" to "READY".)

The trick is to catch the report before it's completed, because once finished, the spool file used to produce the report is eliminated from the queue. Interrupting the printing process requires tenacity, too. Not only must you take the printer offline, you must stop the spooler process. More often than not, when you try to stop the spooler, the computer responds:

```
THE SPOOLER PROCESS IS BUSY, TRY AGAIN.  (CIERR 3226)
```

This message can be very annoying, especially if you see it several times, which is likely to happen. Do expect it to appear, but don't get too frustrated—there is a way around it.

With that caveat in mind, here's how to make changes to an active spool file:

Step One: Stop The Printer

Take the printer offline by pressing the HALT, ONLINE, or OFFLINE button. (If you're using a printer that isn't manufactured by Hewlett-Packard, consult the operator's manual to find out how to stop it.) You should see an LDEV NOT READY message, like this:

```
13:14/68/LDEV nn NOT READY.
              ↑ (the LDEV number of your printer)
```

Step Two: Stop The Spooler

Type: **SUSPENDSPOOL nn** Return
↑ *(your printer's LDEV number)*

and: **STOPSPOOL nn** Return
↑ *(your printer's LDEV number)*

If you're told the "SPOOLER PROCESS IS BUSY", repeat the commands. If you succeed in stopping the spooler, you'll see this message:

```
13:15/14/SP#nn/STOPPED
              ↑ (the LDEV number of your printer)
```

Step Three: Defer The ACTIVE Spool File

Type: **SHOWOUT ACTIVE** Return

Check the device file identification number of the report, then use it in the next command.

Type: **ALTSPOOLFILE #Onnnn;DEFER** Return
(the letter "O", not zero) ↑ ↑ *(use your DFID number)*

Check it by typing: **SHOWOUT ACTIVE** Return

You may have to repeat the ALTSPOOLFILE command a few times, too. When there's no ACTIVE spool file, continue with Step Four.

Step Four: What Are Your Options Now?

Once it's deferred, you can make whatever changes to the spool file you wish, such as:

- Deleting it; refer to page 4-58.
- Sending it to a different printer; refer to page 4-64.
- Printing more copies of the report; refer to page 4-68.

Once you've modified the spool file, continue with Step Five.

Step Five: Resume The Printing Process

Restart the spooler by typing: **STARTSPOOL nn** Return
(use your printer's LDEV number) ↑

The computer lets you know it's been restarted by printing this message on the Console:

```
13:18/107/SP#nn/SPOOLED OUT
              ↑ (the LDEV number of your printer; the
                other numbers will be different)
```

Put the printer back online by pressing the ONLINE or RUN button. (Or, if it's not a Hewlett-Packard printer, restart it according to the manufacturer's instructions.)

Stopping The Printer To Add Paper

Adding new paper to the printer takes just a minute, particularly if you've done it before. For this reason, you probably don't need to prevent users from sending reports to the printer; just take the printer offline momentarily.

To help make the procedure quick and painless, keep an eye on the paper feeder so that you anticipate when more paper will be needed. Then, follow Steps One through Four.

Step One: Prepare The Paper

Unwrap or unbox the new paper and position it next to the printer so that you can add it quickly. Make sure that the fold pattern of the new paper matches that of the paper remaining in the printer.

Step Two: Stop The Printer

Stop the printer by pressing the HALT, OFFLINE, or ONLINE button. (Or, if it's not a Hewlett-Packard printer, follow the manufacturer's instructions for stopping it.)

Step Three: Load And Adjust The Paper

Open the front, top, or side of the printer, if necessary, to expose the paper path. If you need further instructions, consult the operator's manual supplied with the printer.

Add the paper, making sure that you fit the edges onto the feeder tracks properly. If necessary, tape the edges together, but keep the tape away from the perforated edges.

Press the FORM FEED or FORWARD button so that the seam joining the old paper and new paper feeds through the printer smoothly. Close the top or side of the printer, if it's open.

IMPORTANT

If necessary, adjust the paper position so that the top of the printed page matches the top of the form.

Step Four: Restart The Printer

Press the RUN or ONLINE button to restart the printer. Or, if it's not a Hewlett-Packard printer, follow the manufacturer's instructions to restart it.

Fixing a Paper Jam

Paper jams almost always occur while a report is being printed, with the result that one or more pages are usually ruined. Since you'll have to reprint any damaged pages, fixing a paper jam requires you to use some new commands. Follow the steps below:

Step One: Stop All Printing On The Jammed Printer

If the paper begins to jam, the printer will usually stop on its own. If not, quickly press the HALT, OFFLINE, or ONLINE button to stop it (or follow the manufacturer's instructions).

Type: **SUSPENDSPOOL nn** Return

↑ *(use your printer's LDEV number)*

If the computer tells you that "THE SPOOLER PROCESS IS BUSY", repeat the SUSPENDSPOOL command a few times. When you've succeeded in suspending the spooler, the computer prints this message on the Console:

```
14:23/121/SP#nn/SUSPENDED
              ↑ (the LDEV number of your printer; the
                other numbers will be different)
```

Step Two: Fix The Jam

Open the printer at the top or side to expose the jammed paper. For more information, consult the operator's manual supplied with the printer.

Straighten the paper, running enough undamaged sheets through the printer to make sure that it's okay.

Step Three: Restart The Printer

Press the RUN or ONLINE button to restart the printer. Or, if it's not a Hewlett-Packard printer, follow the manufacturer's instructions for restarting it.

Tell the printer to resume printing the report it was working on. You can reprint a specific number of pages, or start at the beginning of the report and make a complete, new copy. For example, to back up 8 pages and then resume printing,

type: RESUMESPOOL nn;BACK 8 PAGES Return
↑ *(use your printer's LDEV number)*

Or, to start over again,

Type: RESUMESPOOL nn;BEGINNING Return
↑ *(use your printer's LDEV number)*

IMPORTANT

The computer counts pages a little differently than you do, so it's a good idea to overestimate the number of pages you want to reprint. You can back up as many as 256 pages.

When the spooler process resumes, you'll see this message on the Console:

```
14:26/46/SP#nn/SPOOLER RESUMED
              ↑ (the LDEV number of your printer; the
                other numbers will be different)
```

Advanced Topics

The information in the next few pages is optional. You don't have to learn this now, but it would be a good idea to read it over after you've become familiar with operating your printer. The topics are:

- Handling Forms Requests
- Responding To "UNABLE TO ALLOCATE $STDLIST" Messages
- Responding To "SPOOFLE I/O ERROR" Messages
- Creating a SPOOK tape.
- Printing reports from a SPOOK tape.

Handling Forms Requests

A forms request is a message sent to the Console that asks you to replace standard printer paper with special paper forms. They were briefly discussed in Chapter One. They're explained in detail below for Operators who are required to use more than one type of paper on a single printer.

You may use your printer to produce two or three types of documents, for example, checks or invoices in addition to standard reports. If so, you'll be asked to change the forms on your printer when the need arises. The request will appear on your Console. To complete the process of changing forms, you may have to respond to two or three Console messages.

A typical scenario—printing payroll checks—is discussed below. Follow these steps to understand the general procedure for changing forms on your printer. If you'd like, make notes in the margin where the process on your computer differs from this example.

Where Does The Forms Request Come From?

Every other Friday, the payroll manager starts the payroll program from his or her terminal. The program, which is "smart" enough to know that it needs check blanks to do the job right, sends a message to the Console, like this:

```
11:20/#J93/FORMS; PLEASE MOUNT PAYROLL CHECKS
```

Since this message doesn't begin with a question mark, you don't need to respond to it. It simply alerts you to the situation. A formal request from the computer, shown below, does require an answer:

```
?11:20/#J61/22/SP#12/LDEV# FOR #S93; OUTFILE ON LP (NUM)?
```

You must respond by telling the payroll program (and the payroll manager) that the printer is or isn't available to print checks. To do so, you need two pieces of information:

- The PIN, or "process identification number", which always appears after the second slash. In the request above, the PIN is 22.
- The LDEV number of the printer you'll use to print the checks.

Responding "Yes" To The Forms Request

Hold down CTRL and type: **A**

At the "=" prompt, type: **REPLY 22,nn** Return

(the PIN in the message) ↑ ↑ *(the printer's LDEV number)*

Because you respond with the LDEV number of your printer, this reply tells the person that they can use it.

Responding "No" To The Forms Request

Hold down CTRL and type: A

At the "=" prompt, type: REPLY #22,0 Return
↑ *(a zero)*

By responding with a zero instead of the LDEV number of your printer, you're telling the person that no printer is available now.

Mounting And Aligning The New Forms

The forms request asks you if the printer is available. If you said yes, another message will appear that gives you a chance to mount the new forms onto the printer and make any necessary adjustments to the paper. For example:

```
?11:30/#61/22/LDEV #25 FORMS ALIGNED OK (Y/N)?
```

At this point, take the printer off line, mount the new forms, and check the alignment of the paper. To print a line of test characters to use in adjusting the paper, respond to the "FORMS ALIGNED OK" question in the following way:

Hold down CTRL and type: A

At the "=" prompt, type: REPLY #22,NO Return
↑ *(the PIN from the message)*

When you have aligned the paper correctly, type the following at the "=" prompt:

Type: REPLY #22,YES Return
↑ *(the PIN from the message)*

Then put the printer back online.

Mounting The Standard Forms

When the payroll checks have been printed, remove the check blanks and mount the paper you normally use on your printer. As soon as the computer is ready to print another report (on standard paper), a message like this appears:

```
13:05/22/STANDARD FORMS
?13:05/#S116/76/SP#12/LDEV# FOR #S116;L ON LP (NUM)?
                ↑ (this is a different request, so
                  the PIN is different)
```

Respond to this question after you have mounted the standard paper:

Hold down [CTRL] and type: **A**

At the "=" prompt, type: **REPLY 76,nn** [Return]

(the PIN from the message) ↑ ↑ *(the printer's LDEV number)*

Responding to "Unable to Allocate $STDLIST" Messages

"$STDLIST", or "standard list" is a special name the computer uses to describe output devices. During a computer session, the $STDLIST device is frequently a terminal because that's where the computer sends the information that users ask for.

As you discovered in Chapter Three, job results are sent to a printer. But if the printer is unavailable, you'll see this message repeated on the Console:

```
UNABLE TO ALLOCATE $STDLIST
                          ↑ ("Standard list" device)
```

To solve the problem, first ask for a list of jobs that have been submitted to the computer.

Type: SHOWJOB JOB=@J Return

Check the JLIST column; it tells you the LDEV number or device class name of the printer that's used to print job results. Use the number or name of that printer with the SHOWDEV command to find out its status:

Type: SHOWDEV LP Return
↑ *(substitute your printer's device class name or LDEV number)*

The computer will most likely respond with the information below:

```
:SHOWDEV LP (what you typed)
LDEV      AVAIL      OWNERSHIP      VOLID          DEN     ASSOCIATION
nn        UNAVAIL    DOWN
↑ (a number; check your screen)
```

This means the spooler has been stopped and the printer has been "downed", which makes it unuseable. If your computer lists the printer as "DOWN",

type: UP nn Return
↑ *(use the LDEV number from your screen)*

If it's also listed as "UNAVAIL(able)", type the next two commands:

Type: OPENQ nn Return

Type: STARTSPOOL nn Return
↑ *(use the LDEV number from your screen)*

You may get a Console message like the one below, telling you that the printer is once again "SPOOLED" for "OUT(put)":

```
13:21/19/SP#nn/SPOOLED OUT
              ↑ (the LDEV number of your printer;
                the other numbers will be different)
```

This means that the printer can be shared among all computer users. When the computer prepares job results, the $STDLIST device (the printer) can be allocated, or used.

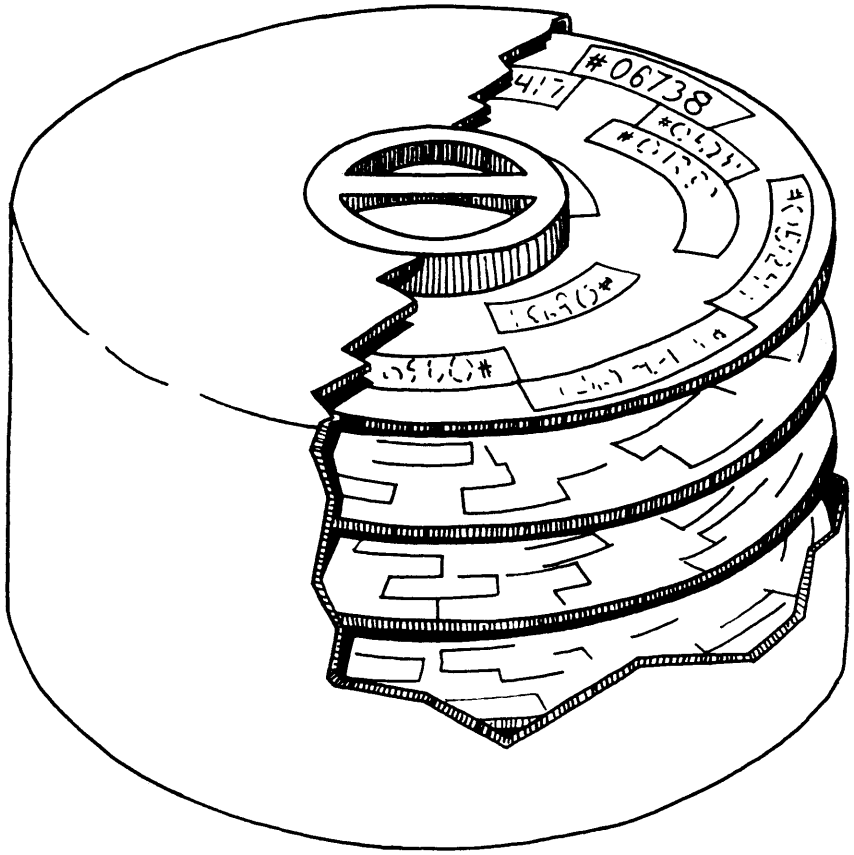
Check the printer again by typing: SHOWDEV LP Return
(use your printer's name or number) ↑

```
:SHOWDEV LP (what you typed)
LDEV      AVAIL      OWNERSHIP      VOLID          DEN     ASSOCIATION
6         SPOOLED    SPOOLER OUT
```

Responding to "Spoofle I/O Error" Messages

Before they are printed, spool files are stored in a special area of the disc reserved specifically for them. The amount of available space is set in advance when the computer system is "configured", or defined. (For more information about system configuration, refer to Section VII of the System Operation and Resource Management Reference Manual, Part Number 32033-90005.)

Spool files are erased from this area of the disc when they are printed, and new ones are added as reports are prepared for printing. But, because spool files vary in size, it's a little like fitting pieces of a jigsaw puzzle together. The computer finds the best fit between the space available and new spool files it needs to store.



If the space becomes too fragmented, or if the amount of spool file space isn't sufficient for the volume of printing activity, the computer may not be able to find a place to store new spool files. To warn you, the computer sends a message like this to the Console:

```
SP#nn/STOPPED, SPOOFLE I/O ERROR
    ↑ (the LDEV number of your printer)
```

If you see this message, let your System Manager know. The long-term solution may be to increase the amount of disc space reserved for spool file storage. To solve the problem in the short term, follow the steps below:

Step One: Find Out Where Spool Files Are Stored

Disc drive(s) assigned the device class name "SPOOL" store spool files. Check the device list posted at your Console to find out which ones these are, and remember their LDEV numbers. (If you don't have a list, refer to "Creating A Complete List Of Devices" in Chapter One.)

Step Two: Check Available Disc Space

For each disc drive named "SPOOL", find out how much disc space is available:

Type: RUN FREE5.PUB.SYS Return

If the computer tells you it can't find the FREE5 program,

type: RUN FREE2.PUB.SYS Return

FREE2 is an earlier version of the FREE5 program; your computer system will have one or the other.

Starting with LDEV 1, the computer tells you how much free contiguous disc space it finds. Pay close attention to the free space available on disc drives that your computer uses for spool file storage. For example:

```
FREE5 G.01.00 (C) HEWLETT-PACKARD C0., 1983
VOLUME MH7925U0
LARGEST FREE AREA= 9868
  SIZE  COUNT  SPACE   AVERAGE
>100000 0      0       0
>1000   0      0       0
>100    1      9868    9868
>10     167    15030   90
>1      145    1160    8
TOTAL FREE SPACE=125310
```

- First, look at the first two or three rows of data. If you see mostly 0's, then there's a good chance that whatever space is available is divided into small fragments. This makes storing files difficult, if not impossible.
- Second, look at the number next to "TOTAL FREE SPACE". If this number is small, then you're running out of space to store spool files.

Step Three: Prevent Users From Sending Reports To The Printer

Type: **OUTFENCE 14** Return

Check it by typing: **SHOWOUT STATUS** Return

If more than one outfence is listed at the bottom of your screen, raise the outfence to its maximum for each individual printer.

Type: **OUTFENCE 14;LDEV=nn** Return

↑ *(use your printer's LDEV number)*

Repeat this command for each printer connected to your computer.

Type: **STOPSPOOL nn** Return

↑ *(use your printer's LDEV number)*

Repeat the STOPSPOOL command for each printer connected to your computer. Or, if more than one printer is assigned the same device class name, use it to stop the spooling process for all of them.

IMPORTANT

The STOPSPOOL command also shuts the spool queues, which prevents spool files from accumulating. The only ones listed will be reports that users asked the computer to print before you stopped the spooler.

Check unprinted spool files by typing: SHOWOUT SP Return

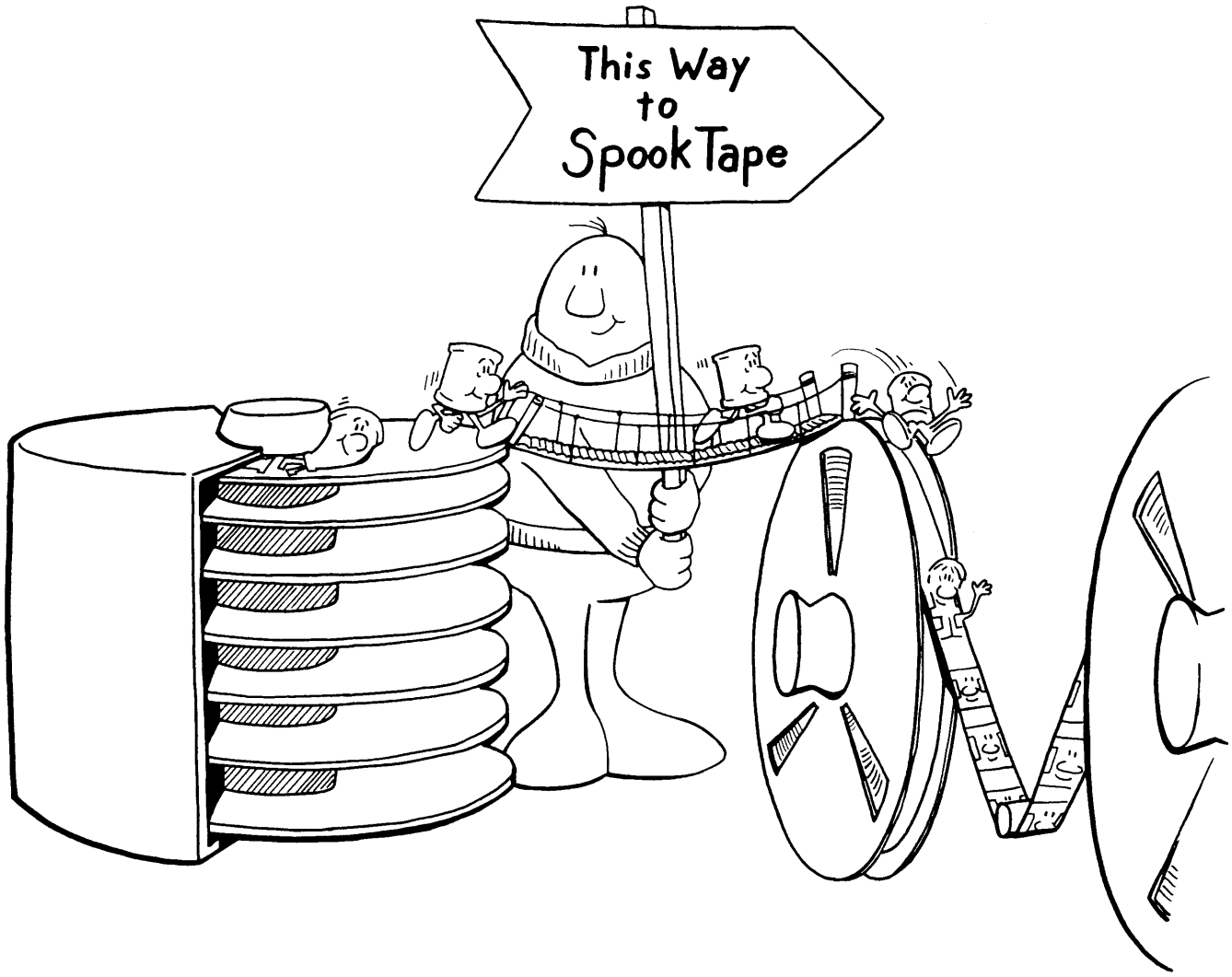
In the next step, you'll copy spool files that are listed as "READY" onto a tape. Since you want to copy all of them, repeat the SHOWOUT SP command periodically. The spooler will keep working on "OPENED" spool files until they're ready for printing (or copying, in this case).

Step Four: Copy The Spool Files To A Tape

Store the spool files that are ready and waiting to be printed onto a tape, following the directions for "Creating A SPOOK Tape" on page 4-87.

IMPORTANT

As you copy the spool files onto tape, they are also erased from the disc. This should free large, contiguous areas of the disc.


This Way
to
Spook Tape

Step Five: Check The Disc Again

Check how much free space is now available on your disc.

Type: RUN FREE5.PUB.SYS Return

If there are more large areas of disc space available now, the numbers in the first few rows should be noticeably different. For example:

```
:RUN FREE5.PUB.SYS (what you typed)

FREE5 G.01.00 (C) HEWLETT-PACKARD CO., 1983
VOLUME MH7925U0
LARGEST FREE AREA= 176572
  SIZE  COUNT  SPACE   AVERAGE
>100000 1      176572   176572
>10000  8      65743    8218
>1000   27     17334    642
>10     290    19720    68
>11     103    618      6
TOTAL FREE SPACE=279987
```

If the disc is still fragmented, you may need to shut the computer system down and restart it using the "coolstart' option. To shut down the computer, read Chapter Nine. To restart it, refer to Chapter Eight.

The disc space example above is, at best, a rough guideline. What is considered sufficient available disc space for your system depends upon the capacity and size of your disc drives, how heavy the demand for the printer is, and the average and maximum size of your printed reports. Talk to your System Manager and other experienced Operators to get a better idea of what to look for on your computer.

Creating a SPOOK Tape

A "SPOOK tape" is a cartridge or reel tape that contains complete, or "READY", spool files. The spool files can be transferred from the SPOOK tape back to the computer, and printed, at any time. For this reason, copying spool files onto a tape is useful when:

- You want to shutdown the computer, and don't have enough time to print everyone's reports.
- You occasionally need to print a new copy of a standard report. Instead of storing the report on the computer, you can keep it on a SPOOK tape.
- There are a large and growing number of reports that need to be printed, and less and less room to store them. By copying the less critical reports onto a SPOOK tape, you can make room for the important ones.
- Someone needs a very long report printed, or several copies of a report. Instead of tying up the printer, copy the report onto a SPOOK tape, then print it later when the printer isn't being used.

If you're assigned OP capability, you can create a SPOOK tape containing anyone's, or everyone's spool files. If you need to, check your capabilities on page 1-2.

Preparing A Cartridge Tape

The following steps are brief; complete cartridge tape handling instructions are available in Chapter Five. Specifically read Steps One through Four, and Steps Six, Seven, and Eight in the first part of the Chapter entitled "Storing A File Onto Cartridge Tape", beginning on page 5-4.

1. Select a "scratch tape" from your tape library. This is one that has no information on it, or only unimportant information.
2. Make sure the arrow on the cartridge is pointed away from SAFE;
3. Insert the tape into the drive.
4. Wait for the BUSY light to go off. (The light may stay on for up to two minutes, and when you're waiting, this will seem like a very long time.)

IMPORTANT

If both the PROTECT and BUSY lights come on, no files can be copied to the tape because it is "write-protected". To fix the problem, remove the tape, turn the arrow away from SAFE, and start over again. If you need help, consult the directions on page 5-10 in Chapter Five.

5. Go back to the Console and check for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV nn.
                                  ↑ (a number; check your screen)
```

It means that you have prepared and mounted the tape correctly, and it's ready to be used. (Remember the LDEV number in this Console message. You'll use it when you answer the tape request in Step Two.)

Preparing A Reel Tape

The following steps are brief; complete instructions for handling reel tapes are included in Chapter Five. Specifically read Steps One through Three and Steps Five through Eight in the second half of the chapter, beginning on page 5-20.

1. Remove the tape band and insert a write ring into the circular groove on the back of the tape.
2. Put the reel onto the empty spindle.
3. Unwind about four feet of tape. Thread it around the knobs and onto the fixed, empty reel, using the diagram on the tape drive as a guide.

IMPORTANT

If you haven't used the tape drive much, threading the tape is very frustrating and time-consuming. Don't worry about it. All "experts" were beginners at one time, and probably made the same mistakes you might make.

4. Rotate the fixed reel clockwise, winding enough tape around it so that it won't come loose. (When you've done this correctly, turning the fixed reel causes the spindle containing your tape to move.)
5. Press the LOAD button. The tape will wind forward slowly, then stop.
6. When the tape stops, press the ONLINE button. The tape will move jerkily, then stop.
7. Go back to the Console and check for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV nn.
                                    ↑ (a number; check your screen)
```

If you see the message, you have prepared and mounted the tape correctly, and it's ready to be used. Remember the LDEV number in your Console message. You'll use it when you reply to the tape request in Step Two.

Step One: Type The Commands

If using a cartridge tape, type: `FILE T;DEV=CTAPE` Return

If using a reel tape, type: `FILE T;DEV=TAPE` Return

Type: `RUN SPOOK5.PUB.SYS` Return

or type: `RUN SPOOK.PUB.SYS` Return
↑ *(don't add the "5")*

Wait for SPOOK to identify itself and print the ">" prompt on your screen.

Type: `OUTPUT @.@;*T,PURGE;SHOW=OFFLINE` Return

Typing "SHOW=OFFLINE" tells the computer to print a description of the files that are copied to the tape. The printed report, which duplicates the information you'll see on your Console, can be kept in a folder for your records, or attached directly to the reel or cartridge with a piece of tape.

Next, one of two messages will appear on your screen. The computer may begin describing the spool files, one by one, as they're copied to the tape. If so, skip to Step Three. Otherwise, you'll see a tape request, like this:

```
?14:58/#Snnn/nnn/LDEV# FOR "T" ON CTAPE (NUM), WRITE RING? (Y/N)
```

IMPORTANT

If you're using a reel tape and forgot to insert a write ring into the reel, you'll see this message:

14:58/2/LDEV#nn NO WRITE RING

You must rewind and remove the tape, then insert a write ring into the reel and start over again. If you need help, read Step Five, "What To Do If You See "NO WRITE RING", on page 5-29 in Chapter Five.

Step Two: Respond To The Tape Request

The tape request is the computer's way of asking whether or not the tape drive is available. Since you already mounted the tape, you can respond "yes".

Hold down CTRL and type: A

At the "=" prompt, type: REPLY nn,n,Y Return

(use your PIN) ↑ ↑ *(use your tape drive's LDEV number)*

As soon as you press Return, the BUSY light will come on or the tape will begin moving. Also, SPOOK will tell you what files it has copied by listing them on the Console.

Step Three: Remove The Finished Tape

If you're using a cartridge tape, it will automatically rewind itself after all the files have been copied. (While it's rewinding, the BUSY light will be on.) When the BUSY light goes off, remove the tape from the drive.

To remove a reel tape after all the files have been copied, press the REWIND button. When the tape stops moving, take the reel off the spool and wrap a tape band around it.

Step Four: Secure And Label The Tape

If you're using a cartridge tape, turn the arrow on the cartridge towards SAFE. If you're using a reel tape, remove the write ring.

Label the tape with your name, the date it was created, the files it contains, and the date after which the files can be safely erased. In the "REMARKS" section, clearly indicate that it is a SPOOK tape.

Step Five: End The SPOOK Program

End the SPOOK program by typing: EXIT Return

You'll see the message "END OF PROGRAM" and the colon prompt.

Printing Reports From A SPOOK Tape

To print reports that are stored on a SPOOK tape, you must first transfer the spool files back to the computer. Since SPOOK tapes don't look any different from STORE tapes at first glance, check the label carefully. The "REMARKS" section should tell you if the tape contains spool files (a SPOOK tape) of if the tape was created with the STORE command (a STORE tape).

If the SPOOK tape contains files belonging to other users (for example, "@.@", which means all spool files on your computer's disc at the time the tape was created), then you must have OP capability to transfer the files back to your disc. If necessary, check your list of capabilities on page 1-2.

If the spool files are stored on a cartridge tape, follow the instructions for "Preparing A Cartridge Tape" on page 4-88. If you're using a reel tape, read "Preparing A Reel Tape" on page 4-89. Then, continue with Step One:

Step One: Type The Commands

If using a cartridge tape, type: **FILE T;DEV=CTAPE** Return

If using a reel tape, type: **FILE T;DEV=TAPE** Return

Type: **RUN SPOOK5.PUB.SYS** Return

or type: **RUN SPOOK.PUB.SYS** Return

The SPOOK program will identify itself, and then the ">" prompt will be printed on the screen.

Type: **INPUT @.@;*T** Return

Next, you'll see one of two things:

- A list of the each spool file that's being transfered from the tape. When it's through, the ">" prompt and a blinking cursor are printed on the screen, awaiting your next command. If this happens, skip to Step Three.
- A tape request, like this:

```
?14:58/#Snnn/nn/LDEV# FOR "T" ON CTAPE (NUM), WRITE RING? (Y/N)
(your session ↑   ↑ (the PIN; check your screen)
    number)
```

Before the files can be transferred from the tape, you'll need to answer the request. To do so, read Step Two.

IMPORTANT

The computer may send you an error message saying that you've used an "INVALID TAPE FORMAT". It means you selected a STORE tape instead of a SPOOK tape, which is an easy mistake to make. Follow the directions for removing the tape (Step Three, page 4-94) then select another tape and try again.

Step Two: Respond To The Tape Request

The tape request is the computer's way of asking whether or not the tape drive is available. Since you already mounted the tape, you can respond "yes".

Hold down CTRL and type: A

When the "=" prompt appears, type: REPLY nn,n,Y Return

(use your PIN) ↑ *↑ (use your tape drive's LDEV number)*

As soon as you press Return, the BUSY light will turn on or the tape will begin moving. The SPOOK program also tells you what files it has transferred from the tape by listing them on the Console.

Step Three: Remove The Tape

If you're using a cartridge tape, it will automatically rewind itself after all the files have been copied. (While it's rewinding, the BUSY light will be on.) When the BUSY light goes off, remove the cartridge from the tape drive.

To remove a reel tape after all the files have been copied, press the REWIND button. When the tape stops moving, take the reel off the spool and wrap a tape band around it.

Step Four: End The SPOOK Program

End the SPOOK program by typing: **EXIT** Return

```
 END OF PROGRAM
:_
```

Step Five: Check The Priority Of The Transferred Spool Files

Type: **SHOWOUT SP** Return

Files transferred from a SPOOK tape look different from standard spool files. For example:

```
DEV/CL   DFID     JOBNUM  FNAME     STATE FRM SPACE RANK PRI #C
LP       #05875   #S'111  $STDLIST  READY       2048    D 1   1
LP       #05876   #S'12   $STDLIST  READY       2048    D 1   1
LP       #05835   #J'54   LISTOP    READY       2048    D 1   1
                    ↑                                      ↑
```

The apostrophe in the job or session number tells you that the spool file was tranferred from a tape. Transferred spool files may also have a low priority.

To print the reports you just transferred from the SPOOK tape, change their priority so that it exceeds the outfence. If only one outfence is displayed, then the minimum output priority you can assign to the spool files must be greater than that number. If you see more than one outfence, do two things:

- Check the list of spool files to find out where the reports you just transferred from tape will be printed.
- Check the outfence for that printer. The minimum output priority you can assign to the spool files must be greater than the outfence for that printer.

To raise their priority, follow the directions in "Making Sure Reports Get Printed" on page 4-62.

For More Information

Each of the commands you've used in this chapter are described in the MPE V/R Commands Reference Manual (Part Number 32033-90005).

For more information about the SPOOK utility program, consult the Utilities Reference Manual (Part Number 32033-90008). It describes the SPOOK commands you've used in this chapter, as well as the other ways in which you can control printing with SPOOK.

Looking Back

1. What do "OPENED", "READY", and "ACTIVE" tell you about a spool file?

2. What is a Device File Identification Number, and when will you use it?

3. If someone has sent a report to the printer, what two output devices will he or she be using, and how do get a description of them?

4. What things do you need to do to prevent all printing activity?

5. In what ways can you change how a report is printed, and when can you do so?

Managing Your Printer Quick Reference

To Do:	Do This:
List all unprinted reports:	Type: SHOWOUT SP Return
List the outfence(s):	Type: SHOWOUT STATUS Return
Change the system outfence:	Type: OUTFENCE n Return
Change the outfence set for a single printer:	Type: OUTFENCE n;LDEV=nn Return ↑ *(the printer's LDEV number)*
List spool files that are ready for printing:	Type: SHOWOUT READY Return
List incomplete spool files:	Type: SHOWOUT OPEN Return
List the spool file that's printing now:	Type: SHOWOUT ACTIVE Return
Find out if someone is printing anything:	Type: SHOWOUT JOB=#Snnn Return ↑ *(a session number)*
Shut the spool queue:	Type: SHUTQ nn Return ↑ *(the printer's LDEV number)*
Suspend printing:	Type: SUSPENDSPOOL nn Return

To Do:	Do This:
Resume printing:	Type: RESUMESPOOL nn Return
Stop the spooler:	Type: STOPSPOOL nn Return
Restart the spooler:	Type: STARTSPOOL nn Return
Check the printer's status:	Type: SHOWDEV nn Return
Stop all printing:	1. Type: OUTFENCE 14 Return 2. And, if necessary, type: OUFENCE 14;LDEV=nn Return 3. Type: SHUTQ nn Return and repeat the SHUTQ command for each printer connected to your computer. 4. Type: DOWN nn Return and repeat the DOWN command for each printer connected to your computer.
Clear the backlog of reports after you've stopped all printing:	1. Type: SHOWDEV nn Return 2. If your printer is "DOWN", type: UP nn Return 3. Type: OUTFENCE 2 Return 4. And, if necessary, OUTFENCE 2;LDEV=nn Return
Defer the printing of a single report:	Type: ALTSPOOLFILE #Onnnnn;DEFER Return *(the letter "O")* ↑ ↑ *(the device file ID)*
Make sure a report gets printed soon:	Type: ALTSPOOLFILE #Onnnnn;PRI=13 Return ↑ *(the device file ID)*
Send a report to a different printer:	Type: ALTSPOOLFILE #Onnnnn;DEV=nn Return *(the printer's LDEV number)* ↑

To Do:	Do This:
Ask for more copies of a report:	Type: `ALTSPOOLFILE #0nnnn;COPIES=nn` Return *(the number of copies)* ↑
Get rid of a spool file before it's been printed:	Type: `DELETSPOOLFILE #0nnnn` Return ↑ *(the device file ID)*
Make changes to the "ACTIVE" report:	1. Type: `SUSPENDSPOOL nn` Return ↑ *(the LDEV number of the active printer)* 2. Type: `OUTFENCE 14;LDEV=nn` Return 3. To find out the report's device file ID number: Type: `SHOWOUT ACTIVE` Return 4. Use this number to defer the file: 5. Type: `ALTSPOOLFILE #0nnnn;DEFER` Return 6. Then use the ALTSPOOLFILE command to switch printers, increase/ decrease the number of copies, change the priority, or delete the spool file.
Add paper to the printer:	1. Prepare the paper. 2. Press the ONLINE, OFFLINE, or HALT button to stop the printer. 3. Load and adjust the paper. 4. Press the ONLINE or RUN button to restart the printer.
Fix a paper jam:	1. Type: `SUSPENDSPOOL nn` Return 2. Straighten the paper and run several undamaged sheets through the feeder to make certain the jam is cleared. 3. Type: `RESUMESPOOL nn;BACK nn PAGES` Return 4. Or type: `RESUMESPOOL nn;BEGINNING` Return

To Do:	Do This:
Copy spool files from a SPOOK tape to the computer:	1. Select a SPOOK Tape. 2. Insert/mount the tape. On a cartridge tape drive, wait for the BUSY light to go out. On a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons. 3. Type in the commands: If using cartridge tapes, type: `FILE T;DEV=CTAPE` Return If using reel tapes, type: `FILE T;DEV=TAPE` Return For both, type: `INPUT @.@;*T` Return 4. Start the SPOOK program: Type: `RUN SPOOK5.PUB.SYS` Return 5. Type: `OUTPUT #Onnnn;*T;PURGE` Return *(the letter "O")* ↑ ↑ *(the device file ID)* 6. Reply to the tape request if one appears. Hold down CTRL and type: `A` Type: `REPLY nn,n` Return *(the PIN)* ↑ ↑ *(the LDEV number)* 7. Exit the SPOOK program: Type: `EXIT` Return 8. List the spool files: Type: `SHOWOUT SP` Return 9. Raise their priority, if necessary: Type: `ALTSPOOLFILE #Onnnn;PRI=8` Return 10. Remove the tape. On a reel tape drive, press REWIND to rewind the tape, then take the reel off the drive. (Cartridge tapes rewind automatically.)

To Do:	Do This:
Store spool file(s) onto a tape:	1. Select a tape. 2. Prepare the tape: Point the arrow on a cartridge tape away from SAFE; insert a write ring into a reel tape. 3. Insert/mount the tape. On a cartridge tape drive, wait for the BUSY light to go out. On a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons. 4. Type in the commands: If using cartridge tapes, type: `FILE T;DEV=CTAPE` Return If using reel tapes, type: `FILE T;DEV=TAPE` Return 5. Start the SPOOK program: Type: `RUN SPOOK5.PUB.SYS` Return 6. Type: `OUTPUT #Onnnnn;*T;PURGE` Return *(the letter "O")* ↑ ↑ *(the device file ID)* 7. Reply to the tape request if one appears: Hold down CTRL and type: `A` Type: `REPLY nn,n,Y` Return *(the PIN)* ↑ ↑ *(the LDEV number)* 8. Remove the tape. On a reel tape drive, press REWIND to rewind the tape, then take the reel off the drive. (Cartridge tapes rewind automatically.) 9. Secure the file. On a cartridge tape, turn the arrow towards SAFE; on a reel tape, remove the write ring. 10. Label the tape. 11. Get your printed report.

Introduction To Chapter Five

This chapter teaches you how to copy computer files onto tape for safekeeping.

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

Computer files can't be photocopied like important written documents. They can, however, be copied to a cartridge or reel tape. And since tapes can be removed from your computer, you can keep the duplicate files in a safe place, such as a file cabinet or vault.

In this chapter, you'll learn the complete "store" procedure by copying some of your own files onto a tape. Although this information will be useful when you need to duplicate your own files, most of the time you'll assist other users. Why? Because you control the tape drive.

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

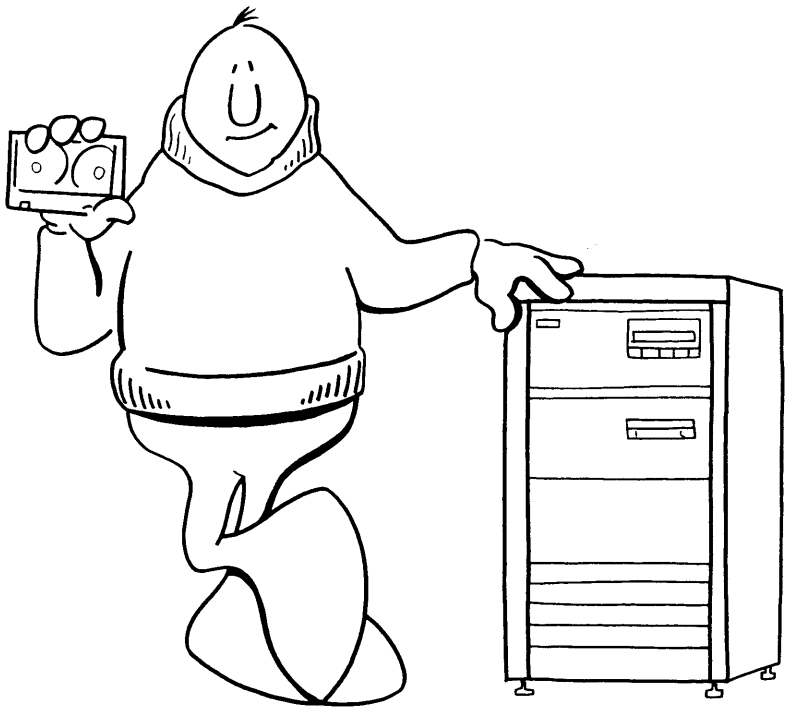
- The user commands the computer to store some, or all, of his or her own files by typing "STORE", and some other information, at their terminal.
- The STORE command automatically sends a tape request to the Console.
- If the tape drive is available, you load and prepare a tape for file copying. Then, to let the user (and the STORE program) know that the copying can begin, you answer the tape request.
- When all the files have been copied, you'll remove the tape and give it to the user.

5 Storing Files

Your Tape Drive

The machine used to copy files onto tape is called a tape drive. There are two types: a cartridge tape drive, which uses cartridge tapes, and a reel-to-reel tape drive, which uses reel tapes.

The Series 37 computer system uses a cartridge tape drive. It is stacked inside a cabinet with other pieces of equipment, like this:

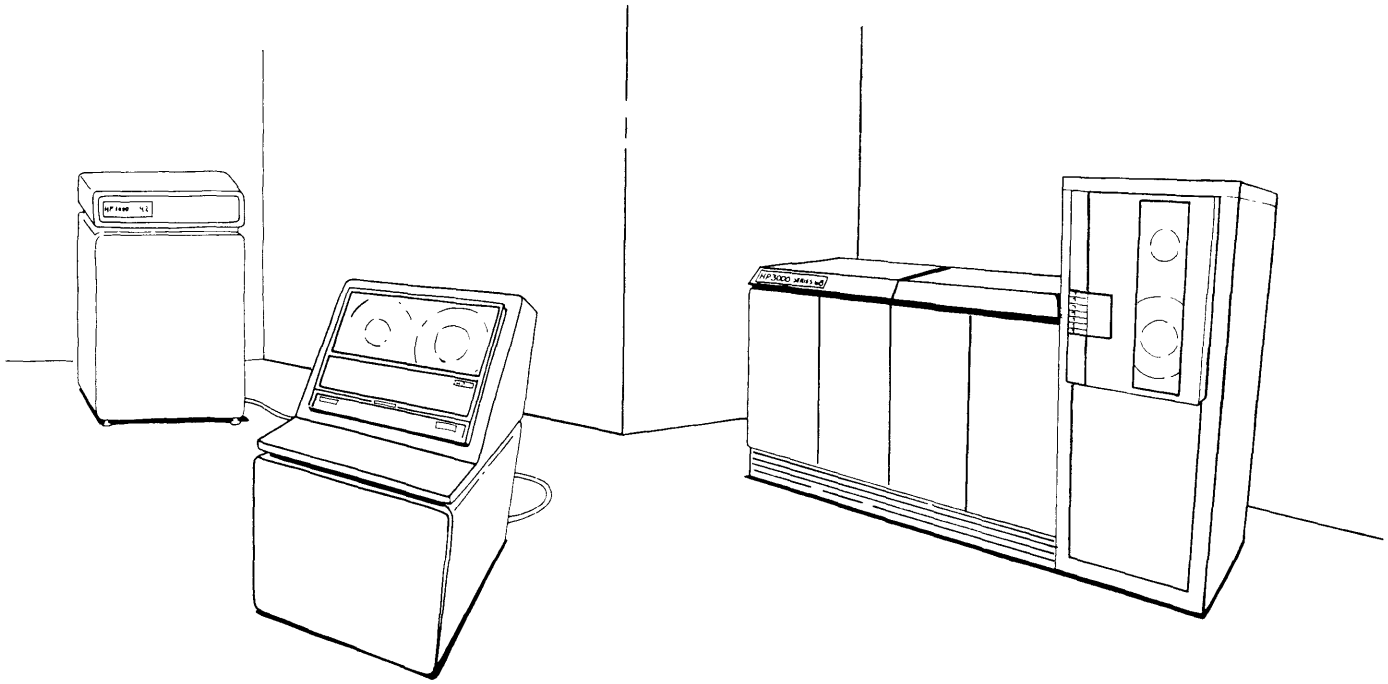


If your tape drive looks like this, read the first half of this chapter, "Storing A File Onto Cartridge Tape", which begins on page 5-4.

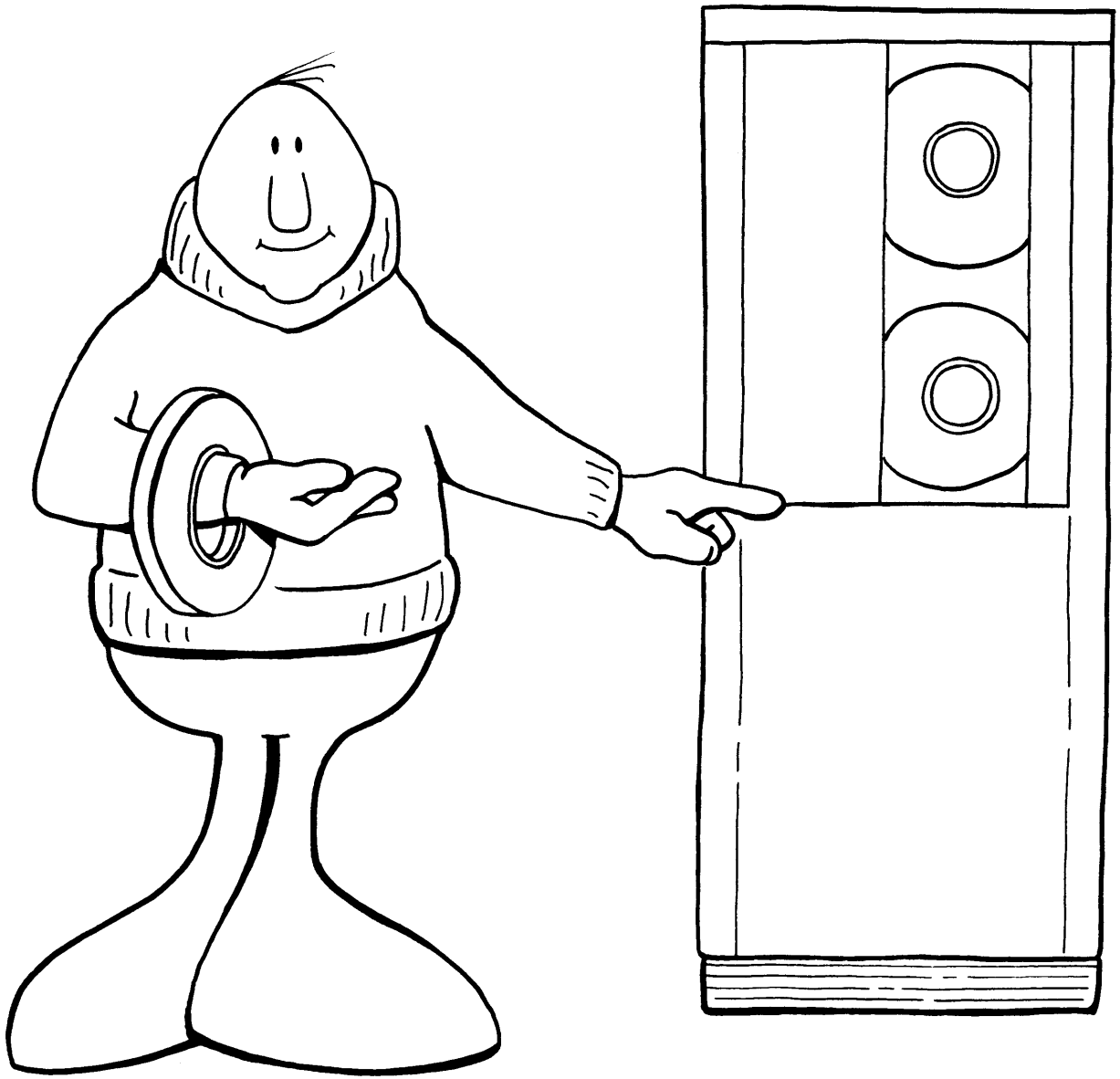
IMPORTANT

The second section, "Storing A File Onto Reel Tape", explains the same information as the first section, but for reel-to-reel tape drives.

Other computer systems generally use reel-to-reel tape drives. There are a few models of reel tape drives, and although they differ in appearance, they operate in basically the same way.



Reel tapes are wound around a reel. To prepare them for file copying, you'll place your reel on the drive, thread the tape through the knobs, then wrap the end of the tape around the empty, fixed reel.



Storing a File Onto Cartridge Tape

If you've read Chapter Three, you probably have at least one file named MYJOB. To check,

type: LISTF␣MYJOB@ Return
↑ *("all files that begin with 'MYJOB'")*

If the computer tells you that there are "NO SUCH FILE(S)", go to Chapter Three, page 3-4, and follow the instructions for creating a job file. Then begin with Step One, below.

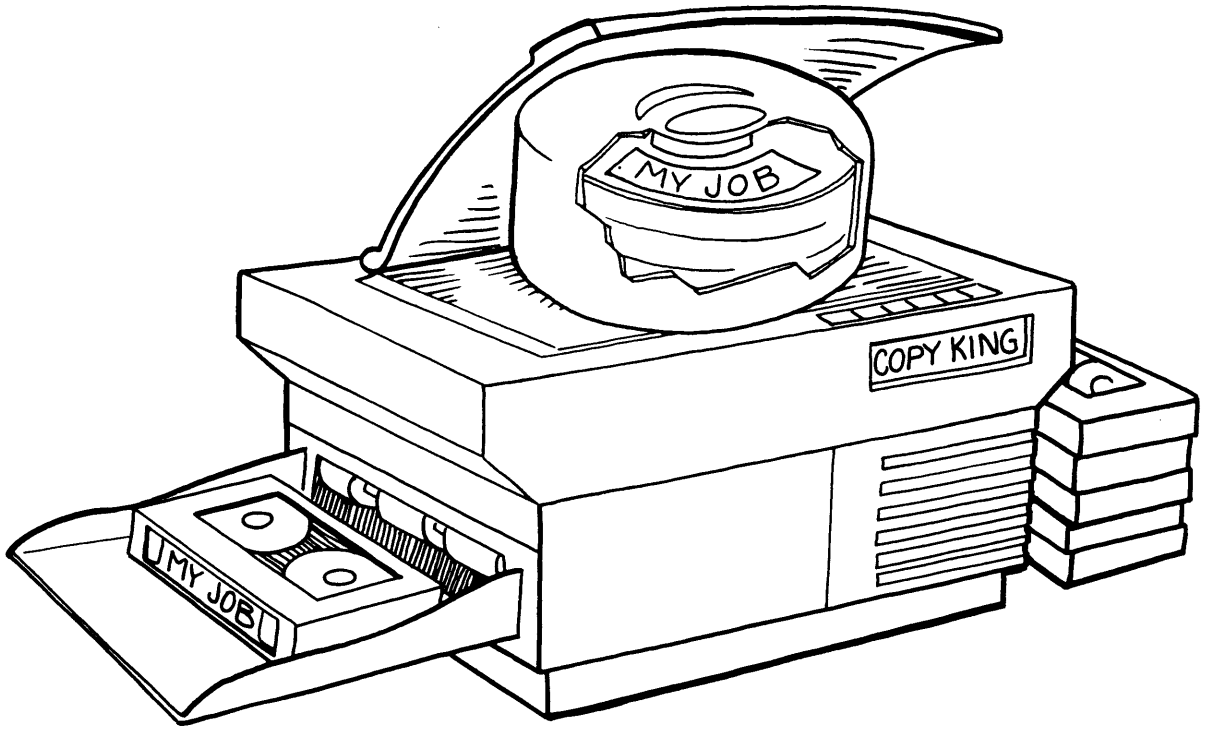
If you already have a file named MYJOB, the computer lists it, and any other variations of the file name, like this:

```
MYJOB     MYJOB1     MYJOB2     MYJOB3
```

To learn the store procedure, you'll follow Steps One through Ten, below, to copy MYJOB onto a tape. When you're finished, you'll have two things:

- A labelled tape containing the file MYJOB. This tape is known as a "STORE tape" because you create it with the STORE command.
- A printed description of the file you copied onto the tape for your records.

When you copy a file onto a tape, you're duplicating it. The original file, which is permanently stored on the computer's disc, remains on the disc.



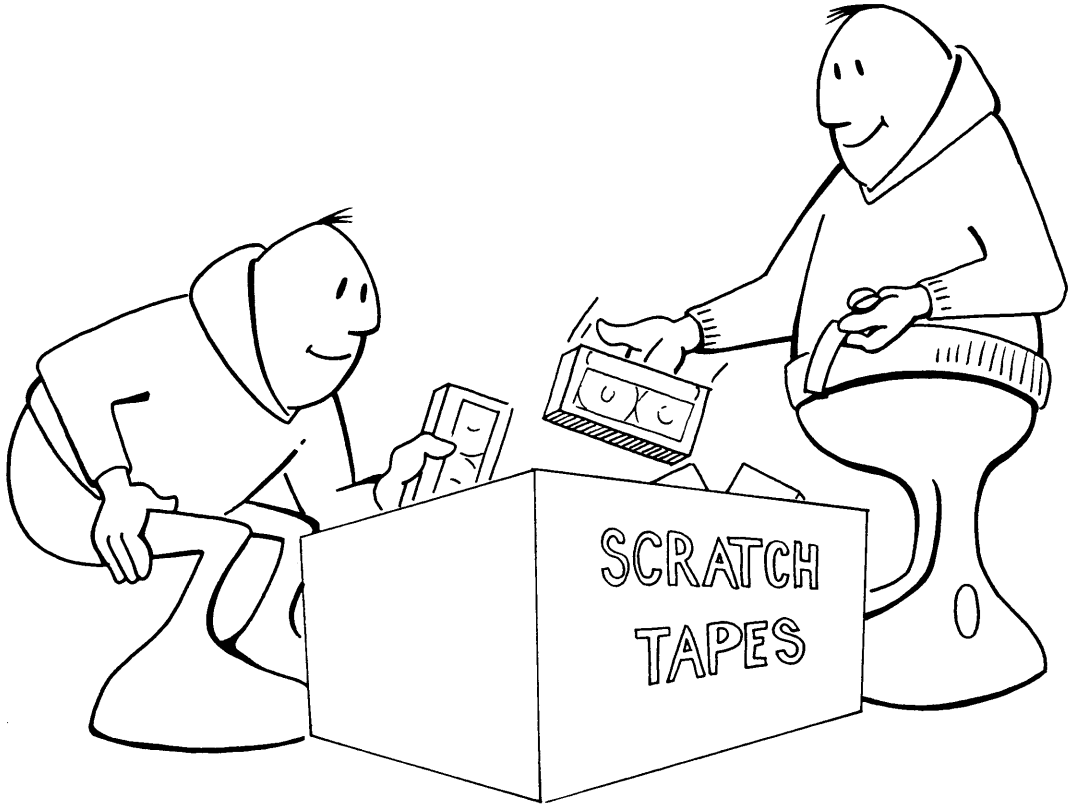
Step One: Select A Tape

In the same way that stereo cassette tapes can be reused, new information can be recorded over old information on cartridge tapes. Choose a tape that's either brand new, or one that contains files you no longer need.

New tapes will be unlabelled; these you can go ahead and use. Labelled taped, which have been used at least once, may contain important, current information, or outdated information. Check the tape's label to find out if the information is current or outdated. In particular, note the following two things:

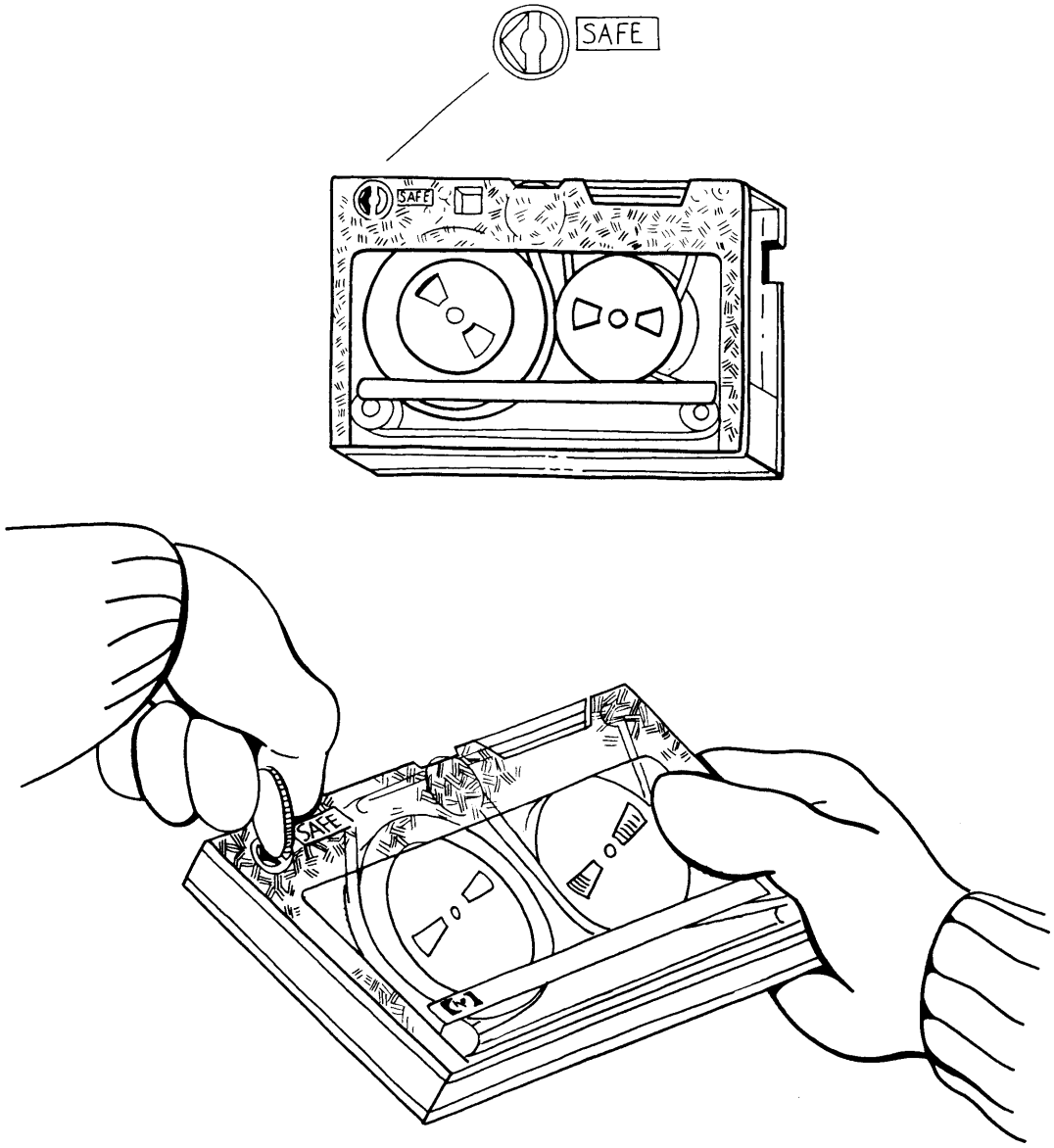
- The name or initials of the person who created the tape. Before you use it, you might want to ask if it's okay.
- The "purge date", which is the date after which the information is no longer needed. If today's date is later than the purge date, you can use it.

Unless you're certain that the tape can be safely reused, choose another one. For convenience, you might also set up a bin or box to store reusable, or "scratch", tapes. Everyone can contribute outdated tapes to the box, and take one when they need it.



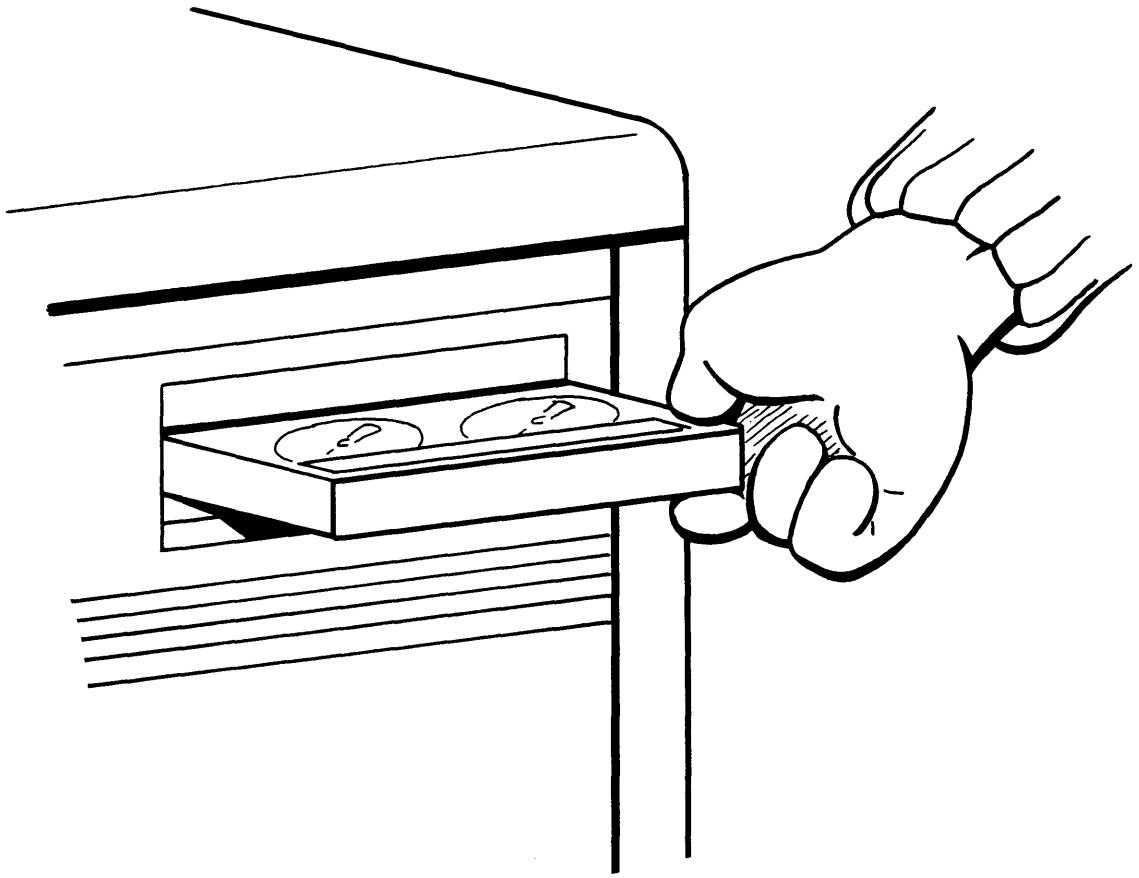
Step Two: Prepare The Tape

Engraved on your cartridge tape is the word "SAFE". Make sure that the arrow next to this label is pointing away from SAFE:



Step Three: Insert The Tape

Double check that the arrow on the tape is positioned away from SAFE. Now, insert the tape into the cartridge tape drive as shown:



Check the lights on the front of the tape drive. Everything's fine if the BUSY light, and no other, is lit. (If the PROTECT light also comes on, skip to Step Four.)

The BUSY light may stay on for as much as two minutes; when you're waiting, this seems like a long time. When it goes out, check your Console for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV nn
                    (a number; check your screen) ↑
```

The computer sends you this message to let you know that the tape has been inserted ("MOUNTED") into the tape drive. Remember the number in the message. It's the LDEV number of your tape drive, which you'll use to respond to the tape request in Step Six.

IMPORTANT

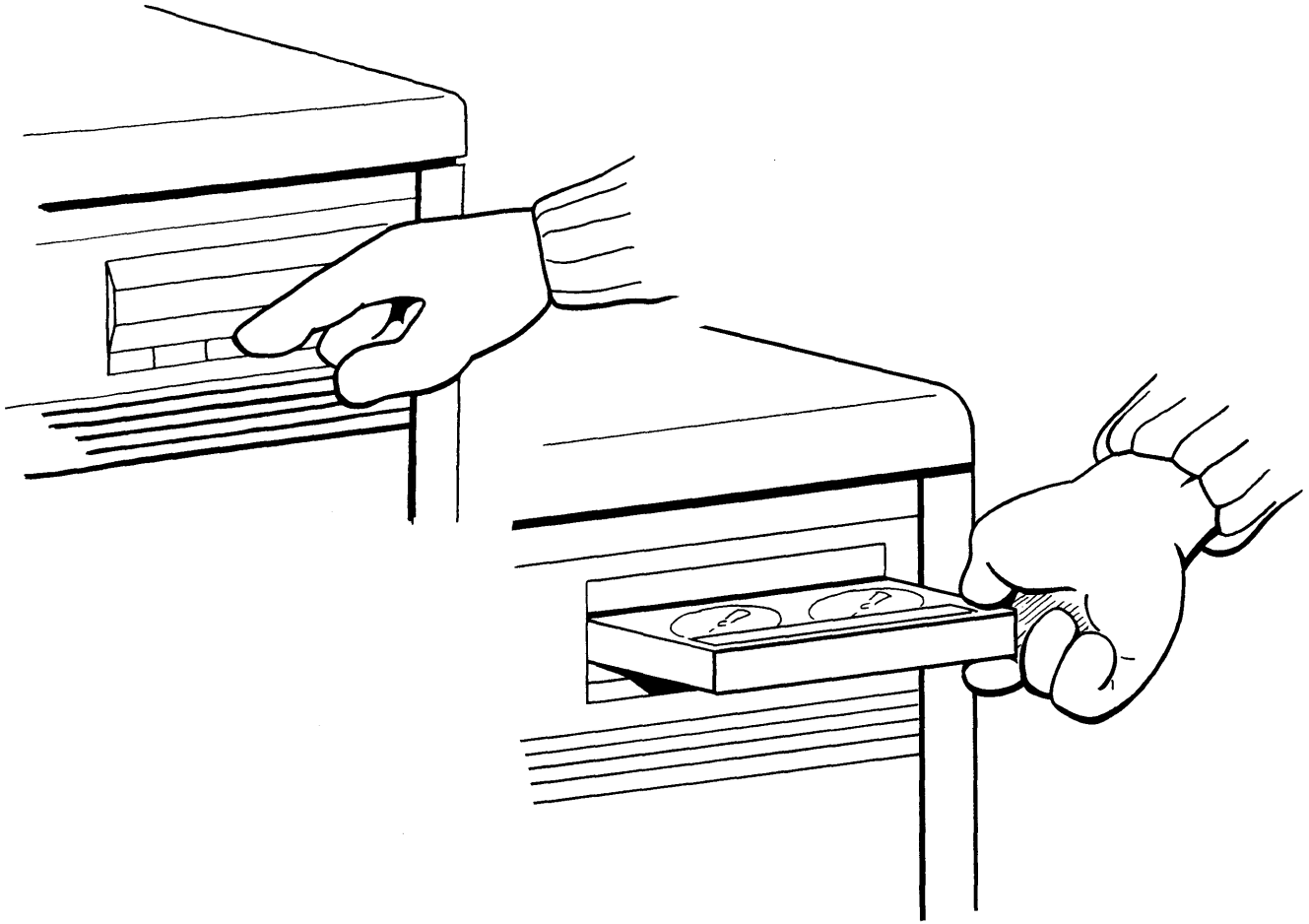
Check Chapter One, page 1-2, to see if you have already recorded the LDEV number of your tape drive. If not, write it down now. Throughout this chapter, and in the remainder of the Guide, you'll be referred back to page 1-2 when you need your tape drive's LDEV number.

When you see the "VOLUME MOUNTED" message on your Console, skip to Step Five on page 5-11.

Step Four: If The PROTECT And BUSY Lights Are On

If both the PROTECT and BUSY lights are lit, you have forgotten to turn the arrow on the tape away from SAFE. Since this prevents information from being copied to the tape, you won't be able to store any new files on it. To correct this mistake:

- Wait for the BUSY light to go out.
- Press the UNLOAD button on the tape drive. (The BUSY light will come on again.)
- Wait for the BUSY light to go out, which again may take up to two minutes. Then, eject the tape by pressing the button located directly below the tape compartment.



- Remove the tape.
- Turn the arrow on the tape away from SAFE.
- Go back to Step Two, on page 5-7, and try again.

Step Five: Tell The Computer To Store Your File(s)

Type: `FILE T;DEV=CTAPE` Return

and: `STORE MYJOB;*T;SHOW=OFFLINE` Return

IMPORTANT

"SHOW=OFFLINE" tells the computer to print a description of the files stored on the tape. If you were copying a lot of files, creating a printed report for your records would make more sense. You're instructed to type it here because it's a good habit, and so you'll know how to do it in the future.

If you mistype anything, the computer responds with an error message. (They're easy to recognize; error messages include either "S/R", "CIERR", or "FSERR" followed by a number.) If you see one, just type the commands again.

When you type the information correctly, you will see a message on the Console like this:

```
STORE/RESTORE, VERSION 2 (C) 1981   HEWLETT-PACKARD CO.
TUE, NOV 6, 1984, 2:57 PM
```

Next, one of two messages will appear on your screen. If you see a description of your file like the one below, it means that you've successfully copied the file onto tape. Skip to Step Seven on page 5-14.

```
FILENAME.GROUP    .ACCOUNT    LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS          1%00114351    1        2

FILES STORED:           1
```

Otherwise you'll see a tape request like the one below:

```
?14:57/#S25/43/LDEV# FOR "T" ON CTAPE (NUM),WRITE RING? (Y/N)
```

Step Six: Respond To The Tape Request

To answer a tape request, you must know:

- The LDEV Number of your tape drive. This number appeared in the "VOLUME MOUNTED" message that was printed on the Console when you inserted the tape in Step Four.
- The process identification number, or PIN, which is part of the tape request.

```
?14:57/#S25/43/LDEV# FOR "T" ON CTAPE (NUM),WRITE  RING? (Y/N)
              ↑ (the PIN; yours may be different)
```

If the request rolled up off the screen to make room for other Console messages, ask the computer to show it to you again. The computer will display your tape request, along with any others that are still "pending".

Hold down CTRL and type: A

At the "=" prompt, type: RECALL Return

Use the PIN in your message and the LDEV number of your tape drive to answer the tape request.

Hold down CTRL and type: A

At the "=" prompt, type: REPLY nn,n,Y Return
(use your PIN) ↑ ↑ *(use your LDEV number)*

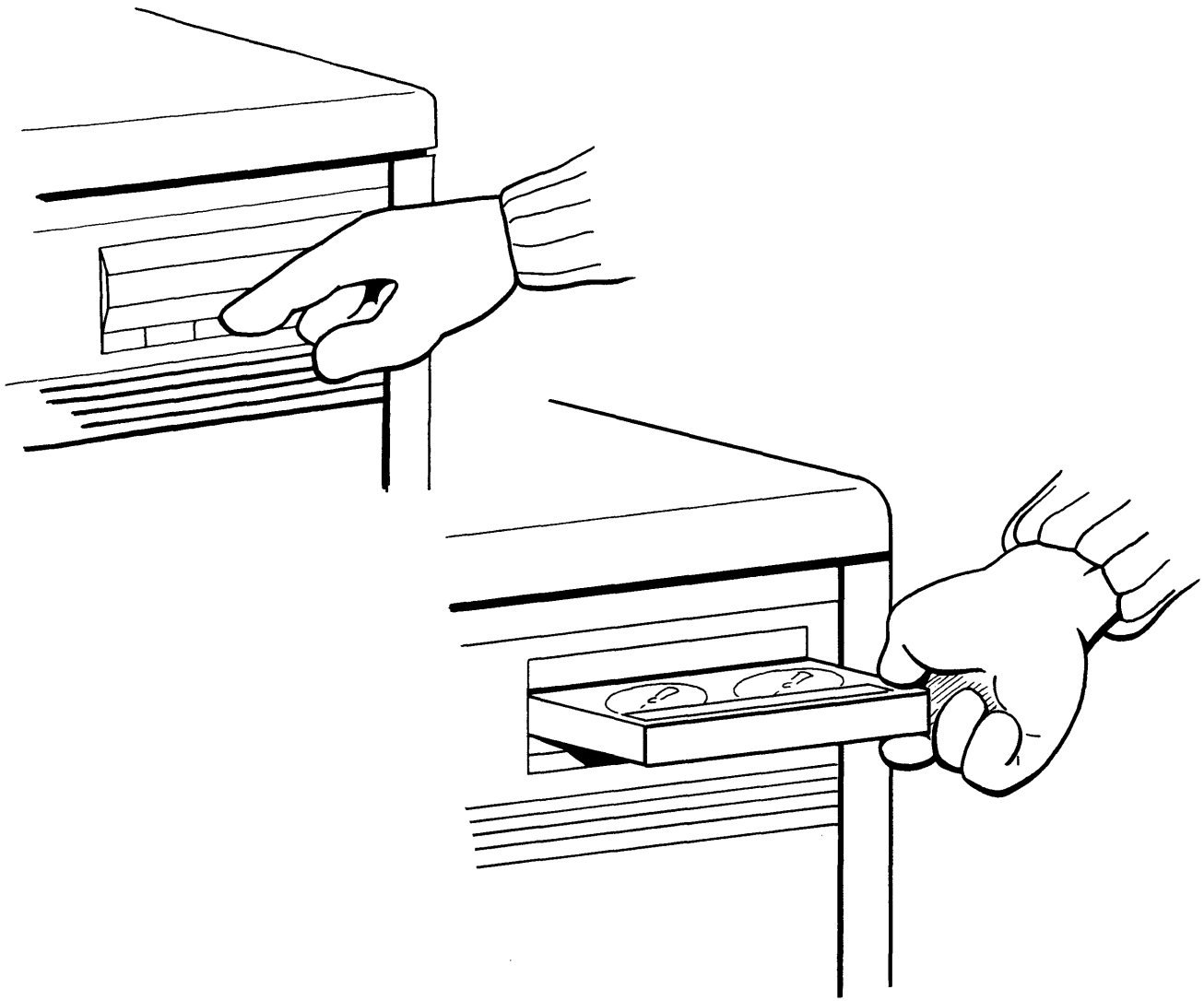
The BUSY light on the tape drive will light up when the computer begins copying the file onto the tape. Go back and check your Console. When the file has been copied to the tape, you'll see a description of it similar to this:

```
FILENAME.GROUP   .ACCOUNT   LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS         1%00114351    1        2

FILES STORED:          1
```

If you were storing a group of files, each one would be listed individually and the total number of files stored reported on the last line.

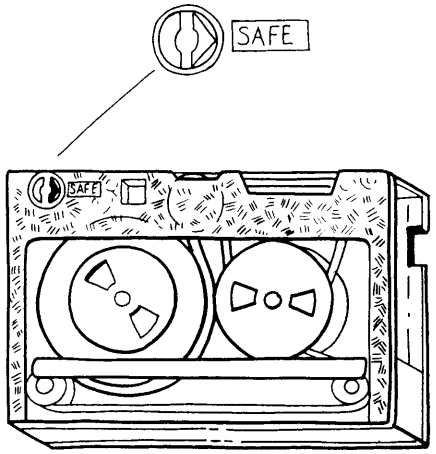
Step Seven: Remove The Tape

Check the BUSY light on the front of the tape drive. It stays on while the tape is rewinding, which could take up to two minutes. When the BUSY light goes out, press the button directly below the tape compartment to eject the tape. Remove the tape.



Step Eight: Secure The File(s)

Turn the arrow on the tape so that it points toward SAFE. As long as the arrow is in this position, the file cannot be removed from the tape and no other file can be copied onto it. MYJOB is, indeed, safe.

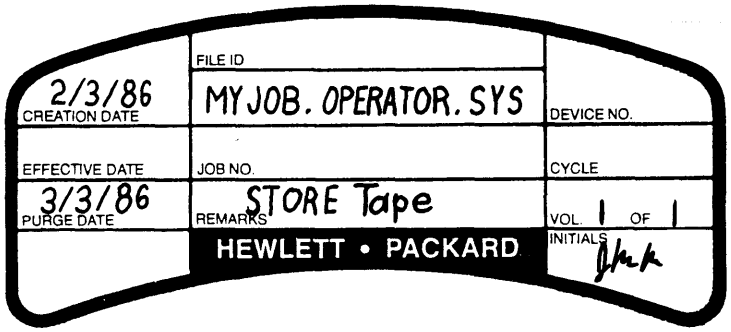


Step Nine: Label The Tape

To ensure that everyone knows the tape contains important information, place a label on the tape, directly above "CERTIFIED DATA CARTRIDGE". Write the following information on the label:

- Today's date, under "CREATION DATE".
- The complete file name, MYJOB.OPERATOR.SYS, under "FILE ID". ("OPERATOR" is the group the file belongs to, and "SYS" is the account.)
- Any remarks about the tape, under "REMARKS". Since you created this tape with the STORE command, indicate that it is a STORE tape.
- The number of tapes needed to store the file(s). Since you're using just one tape, write "VOL 1 OF 1" to indicate that there's only one tape in the set. In the future you may need two or three tapes (if, for example, you're storing everyone's files).
- Your name or initials, under "INITIALS".
- When the tape will become outdated (which is when the files it contains can be safely destroyed) under "PURGE DATE". If the files will be valuable for an indefinite period of time, write "DO NOT SCRATCH" (meaning "Don't use this as a scratch tape") on the label.

Your tape label should look something like this:



Step Ten: Get Your Printed Report

The description of the stored file(s) that you saw on your Console is also produced in a report. Get the report from your printer and attach it directly to the tape. This way, you'll always know what files a particular STORE tape contains.

Put the tape in a safe location, with other STORE tapes (if you have any). You'll use this tape again when you learn how to transfer files from a tape to the computer in Chapter Six.

Storing All Your Files Onto Cartridge Tape

Your computer identity is made up of three parts:

```
OPERATOR.SYS,OPERATOR
    ↑       ↑       ↑
  user    account  group
  name    name     name
```

Your files belong to the OPERATOR group in the SYS account. That's why this is the complete name of your job file:

```
MYJOB.OPERATOR.SYS
    ↑       ↑       ↑
  file    group   account
  name    name    name
```

In the previous section, you copied one file onto a tape. The next example, a more realistic use of the STORE command, gives you directions for copying all of your files onto a tape. You'll follow the same steps, with one difference: This time, you'll use the wildcard character, "@", to command the computer to store a set of files, not just MYJOB:

```
@.OPERATOR.SYS
↑       ↑       ↑
"all files"  "in the   "in the SYS account"
             OPERATOR
             group"
```

Rather than repeating the steps in detail, Steps One through Ten (from the first example) are summarized below. If you need help, refer to the detailed version of each step beginning on page 5-5.

1. Select a cartridge tape that's either new or one that contains outdated information. DON'T use the tape you just created; you'll need it in Chapter Six.
2. Make sure the arrow on the tape is pointed away from SAFE.
3. Insert the cartridge tape into the tape drive and wait for the BUSY light to go out. Once it's off, check the Console for the "VOLUME MOUNTED" message.
4. If both the BUSY and PROTECT lights come on, remove the tape and start the procedure over again, following the instructions on page 5-7.
5. Type: `FILE T;DEV=CTAPE` Return

   (copies all files in the OPERATOR group)

   and: `STORE @.OPERATOR.SYS;*T;`

   and: `SHOW=OFFLINE` Return

   (prints a report)

   If you typed the command correctly, the computer prints a message on the Console that it has started the "STORE/RESTORE" program.
6. If a tape request appears, respond to it using the LDEV number of your tape drive and the PIN in the tape request.

   Type: `REPLY nn,nn,Y` Return

   (use your PIN) *(use your LDEV number)*

   Then, watch your Console for the report of the store procedure. When it's finished, check the tape drive.
7. When the BUSY light goes out, remove the tape.
8. Turn the arrow on the tape cartridge toward SAFE.
9. Label the tape.
10. Get the printed report and attach it to the tape, and store the tape in a safe place.

Storing Other Users' Files Onto Cartridge Tape

So far, you've copied one of your files as well as a group of your files onto tape. But, can you store files belonging to other computer users?

The answer is yes, IF you've been assigned OP, or "System Supervisor", capability. If you're not sure, check your cabilities on page 1-2. If you didn't write them down, read "What Capabilities Is OPERATOR.SYS Assigned?" in Chapter One to find out.

IMPORTANT

To copy other users' files, you must give the computer a complete file description, including the file name, group name, and account name. To copy a group of files, substitute the wildcard character, "@", in place of all or part of the description. (For example, "@.@.@" describes all computer files.) For more information, refer to the STORE command in the MPE V/R Commands Reference Manual (Part Number 32033-90006).

To store other user's files, follow Steps One through Four to select, prepare, and insert a cartridge tape into the drive. Then type the FILE command:

Type: `FILE T;DEV=CTAPE` Return

Next, tell the computer what files to copy to the tape. For example, you might want to store all the files in the PUB group of the SYS account. Use the wildcard character, "@", to indicate "all files", then specify the group name and account name, like this:

Type: `STORE @.PUB.SYS;*T;SHOW=OFFLINE` Return

At this point, you'll either see a tape request on the Console or a description of the files as they're copied to the tape. Continue with Steps Six through Ten to respond to the tape request, if necessary, and handle the finished tape.

Storing A File Onto Reel Tape

If you've just finished reading about cartridge tapes, most of the information in this section will be familiar. Skim through what you know, but pay particular attention to tape handling instructions (Steps Two and Three) and the commands typed at the Console (Step Four).

If you've read Chapter Three, you probably have one file named MYJOB, and one or more variations (i.e. "MYJOB1", "MYJOB2"). To check,

type: LISTF MYJOB@ Return

If the computer tells you that there are "NO SUCH FILE(S)", go to Chapter Three, page 3-4, and follow the instructions for creating a job file. Then begin with Step One, below.

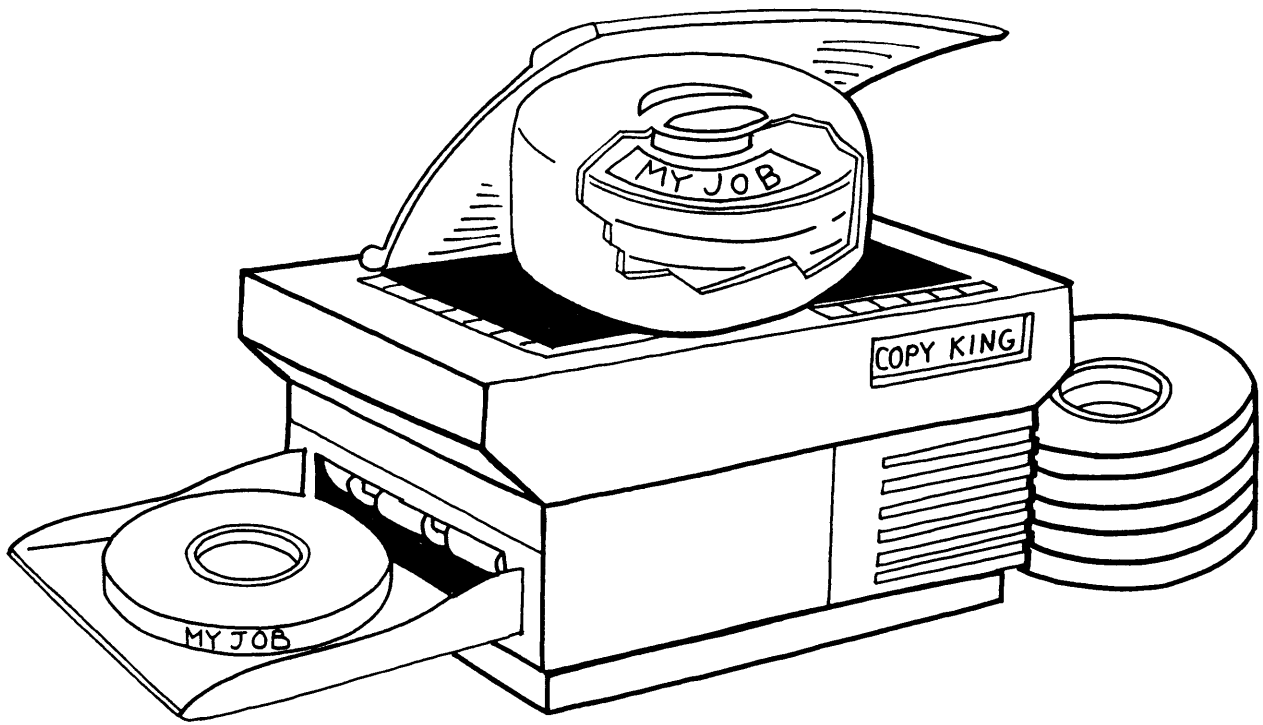
If you already have a file named MYJOB, the computer lists it and any other variations of the file name, like this:

```
MYJOB     MYJOB1     MYJOB2     MYJOB3
```

To explain the store procedure, you'll follow Steps One through Ten, below, to copy MYJOB onto a tape. When you're finished, you'll have two things:

- A labelled tape containing the file MYJOB. This tape is known as a "STORE tape" because you create it with the STORE command.
- A printed description of the file you copied onto the tape for your records.

When you copy a file onto a tape, you're duplicating it. The original file, which is permanently stored on the computer's disc, remains on the disc.



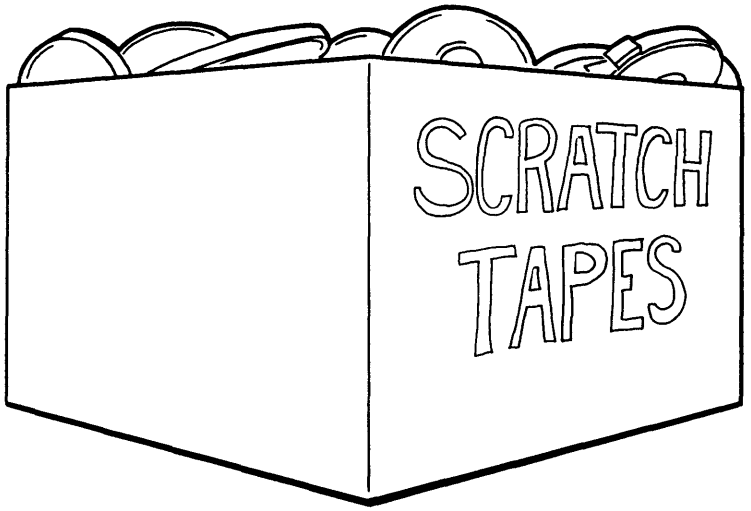
Step One: Select A Tape

New information can be recorded over old information on both cartridge and reel tapes. Choose a tape that's either brand new, or one that contains files you no longer need.

New tapes will be unlabelled; these you can go ahead and use. The information on labelled tapes may be current, in which case you shouldn't use the tape, or outdated. If you're not sure whether it's safe to use, check the following two items on the tape's label:

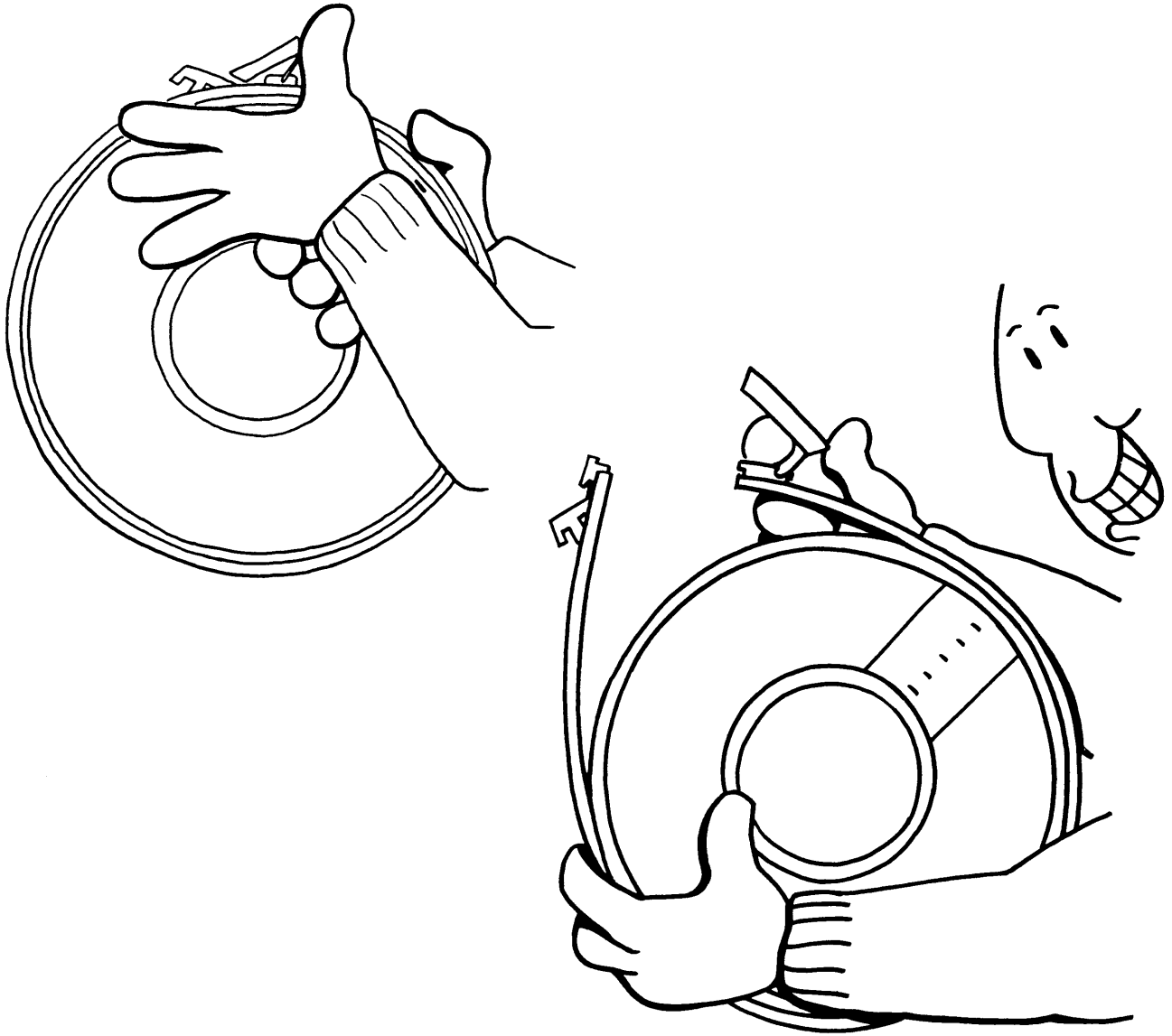
- The name or initials of the person who created the tape. Before you use it, you might want to ask if it's okay.
- The "PURGE DATE", which is the date after which the information is no longer needed. If today's date is later than the purge tape, you can use it. If you see "DO NOT SCRATCH" on the label, the information is valuable for an indefinite period of time, and the tape shouldn't be reused.

Unless you're certain that the tape can be safely reused, choose another one. For convenience, you might also set up a bin or box to store reusable, or "scratch", tapes. Everyone can contribute outdated tapes to the box, and take one when they need it.

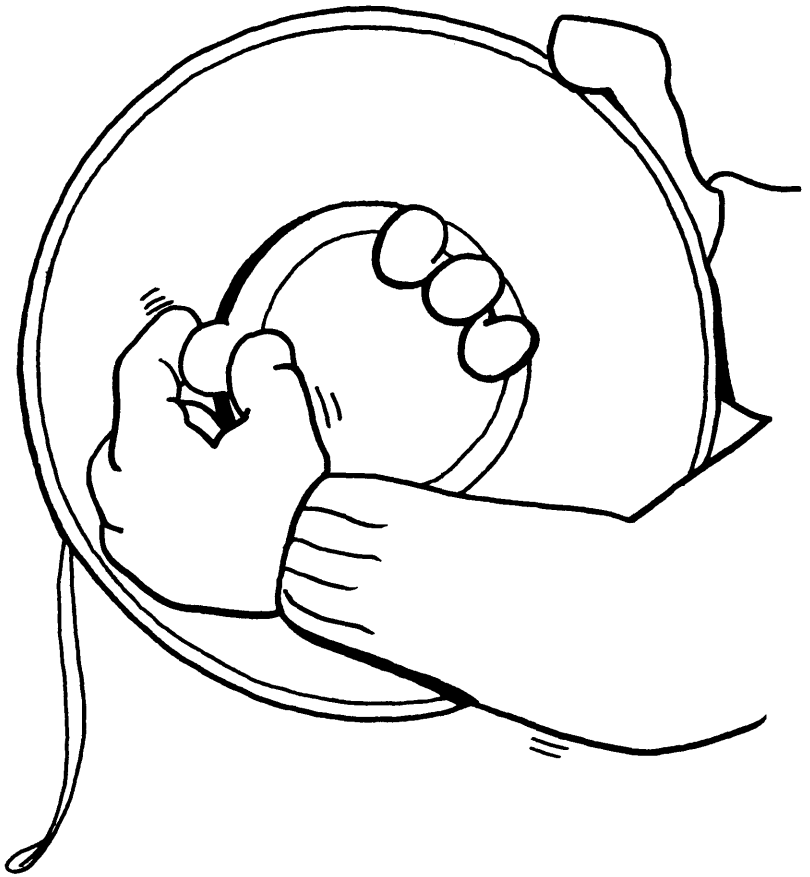


Step Two: Prepare The Tape

Reel tapes are protected by a plastic band that wraps around the reel. Unlatch the band and remove it.

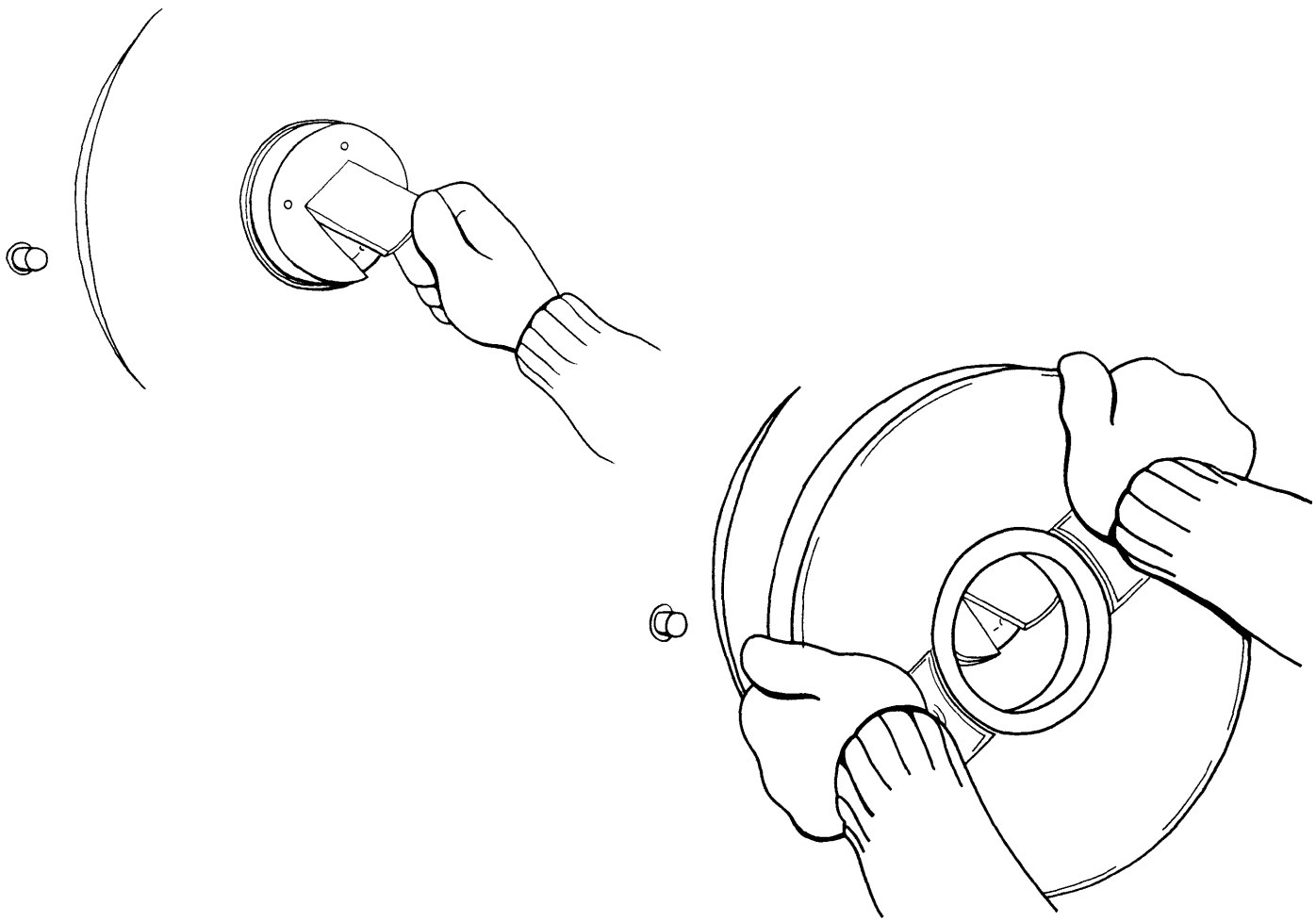


Find the circular groove on the back of the tape reel. Insert a plastic "write ring" into the groove:



Step Three: Mount The Tape And Prepare The Tape Drive

Open the door of your tape drive. You'll see two spools, one without a reel, and one containing an empty, permanently fixed reel. If the spool without a reel has a latch, flip the latch up.

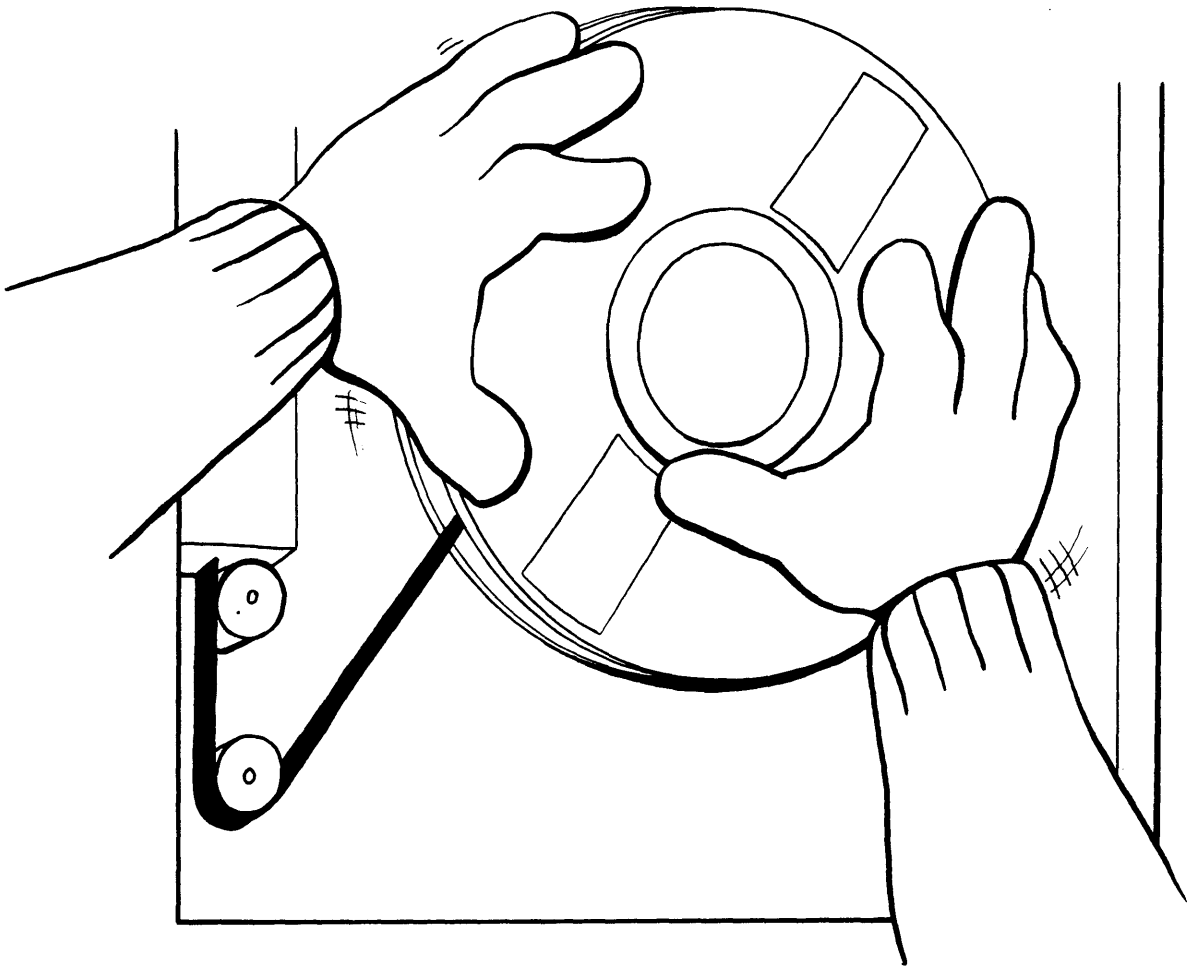


Fit the tape reel onto this spool so that the side with the write ring is placed against the tape drive. The reel will fit snugly onto the spool. If there is a latch on the spool, flip it down to lock the reel in place.

Next, unwind about four feet of tape from the reel. This makes it easier to thread the tape. And, since the first several feet of tape is "leader" and contains no information, you won't damage anything.

Thread the tape around the pulleys using the diagram on the tape drive as a guide. If you've never threaded the tape before, it will be very awkward. Don't worry; everyone who uses the tape drive feels a little fumblefingered at first. Just take your time and make sure the tape follows the path exactly as shown on the tape drive.

When the tape is threaded around the pulleys, pull the free end up and over the top of the empty reel in a clockwise direction. Don't worry if the tape is a little bit loose.



Hold the end of the tape in place on the empty reel, and turn the reel clockwise. Rotate the reel a few times so that the free end won't come off the reel. Check the tension on the tape. If turning one spool by hand also turns the other spool, the tape is mounted securely.

Shut the door of your tape drive. Next, press the LOAD button, then the ONLINE button on the tape drive. The tape will begin to spin. When it stops, go back to the Console and check for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV# nn
                (a number; check your screen) ↑
```

Remember the number in the message. It's the LDEV number of your tape drive, which you'll use to respond to the tape request in Step Six.

IMPORTANT

Check Chapter One, page 1-2, to see if you have already recorded the LDEV number of your tape drive. If not, write it down now. Throughout this chapter and in the remainder of the Guide, you'll be referred back to page 1-2 when you need the tape drive's LDEV number.

Step Four: Tell The Computer To Store Your File(s)

Type: `FILE T;DEV=TAPE` Return

and: `STORE MYJOB;*T;SHOW=OFFLINE` Return

IMPORTANT

"SHOW=OFFLINE" tells the computer to send a description of the files stored on the tape to the printer. If you were copying a lot of files, creating a printed report for your records would make more sense. You're instructed to type it here because it's a good habit, and so you'll know how to do it in the future.

If you mistype anything, the computer responds with an error message. They're easy to recognize; error messages include either "S/R", "CIERR", or "FSERR" followed by a number. If you see one, just type the commands again.

When you type the information correctly, you'll see a message similar to the one below:

```
STORE/RESTORE, VERSION 2 (C) 1981   HEWLETT-PACKARD CO.
TUE, NOV 6, 1985, 2:57 PM
```

Almost immediately, one of three messages will appear on your screen. You've successfully copied the file onto tape if you see a description of your file like the one below. If you do, skip to Step Seven on page 5-31.

```
FILENAME.GROUP   .ACCOUNT   LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS         1%00114351    1        2

FILES STORED:          1
```

Or, the computer responds to the STORE command by displaying a tape request on the Console. If you see a request like the one below, skip to Step Six on page 5-30.

```
?14:57/#S25/43/LDEV# FOR "T" ON CTAPE (NUM),WRITE RING? (Y/N)
```

Or, you might see this message:

```
14:57/#S25/43/NO WRITE RING
```

In this case, you'll need to rewind and remove the tape to put a write ring in the reel, then begin the procedure again. Follow the directions below:

Step Five: What To Do If You See "NO WRITE RING"

If you forgot to insert a write ring into the tape reel earlier, you'll see a message like this:

```
14:57/2/LDEV#nn NO WRITE RING
              ↑ (a number; check your screen)
```

To correct this mistake:

- Press the REWIND button on the tape drive.
- When the tape stops spinning, open the door and flip the spool latch up to remove your tape reel. (If there is no latch, just remove your tape.)
- Insert a write ring into the circular groove on the back of the reel.
- Go back to Step Three, page 5-24, to mount the tape and prepare the tape drive.

Step Six: Respond To The Tape Request

To answer a tape request, you must know:

- The LDEV Number of your tape drive. This number appeared in the "VOLUME MOUNTED" message that was printed on the Console when you mounted the tape in Step Four.
- The process identification number, or PIN, which is part of the tape request.

```
?14:57/#S25/43/LDEV# FOR "T" ON TAPE (NUM),WRITE  RING? (Y/N)
            ↑ (the PIN; yours may be different)
```

If the request rolled up off the screen to make room for other Console messages, ask the computer to show it to you again. The computer will display your tape request, along with any others that are still "pending".

Hold down [CTRL] and type: **A**

At the "=" prompt, type: **RECALL** [Return]

Use the PIN in your message and the LDEV number of your tape drive to answer the tape request.

Hold down [CTRL] and type: **A**

At the "=" prompt, type: **REPLY nn,n,Y** [Return]
(use your PIN) ↑ ↑ (use your LDEV number)

When the computer begins copying the file onto the tape, the tape will move. Since you're only copying one file, it will move just for a second or two, then stop.

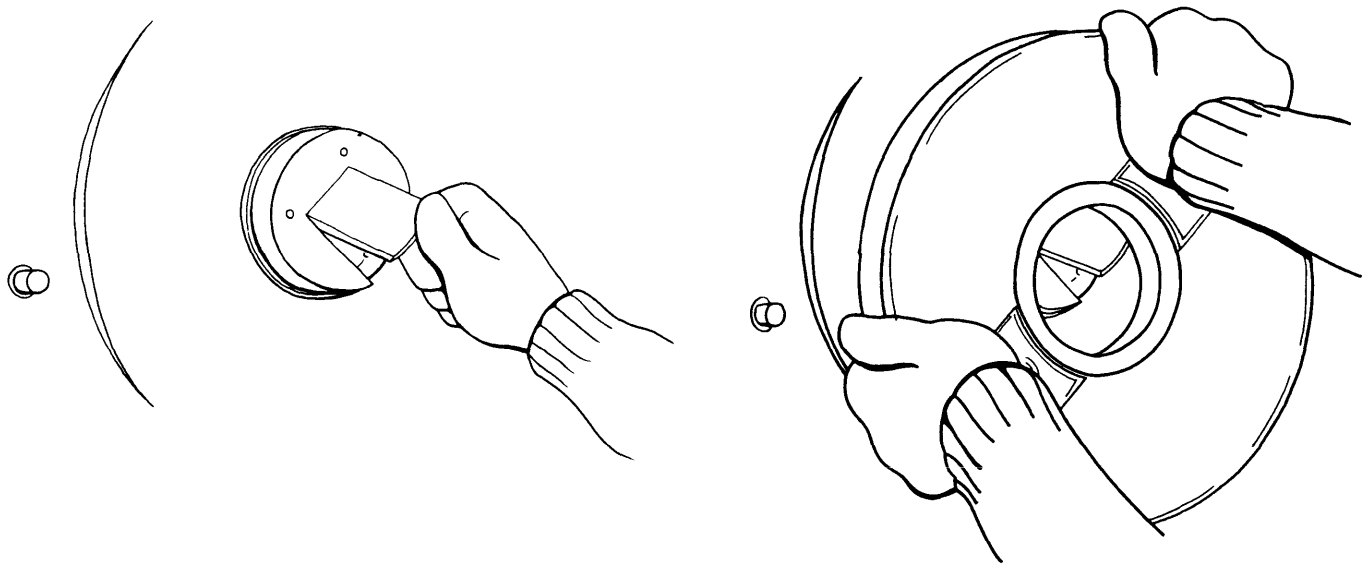
Check your Console. When the file has been copied to the tape, you'll see a description of it like this:

```
FILENAME.GROUP   .ACCOUNT    LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS         1"00114351    1        2

FILES STORED:          1
                       ↑ (the number of files copied)
```

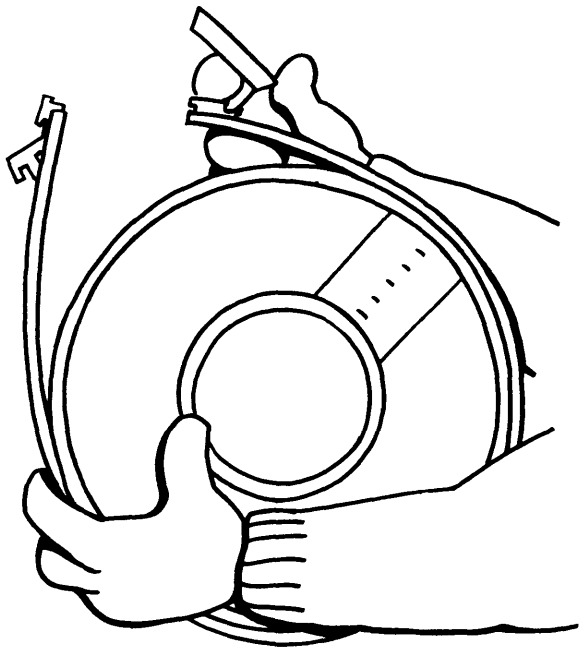
If you were storing a group of files, each one would be listed individually, and the total number reported on the last line.

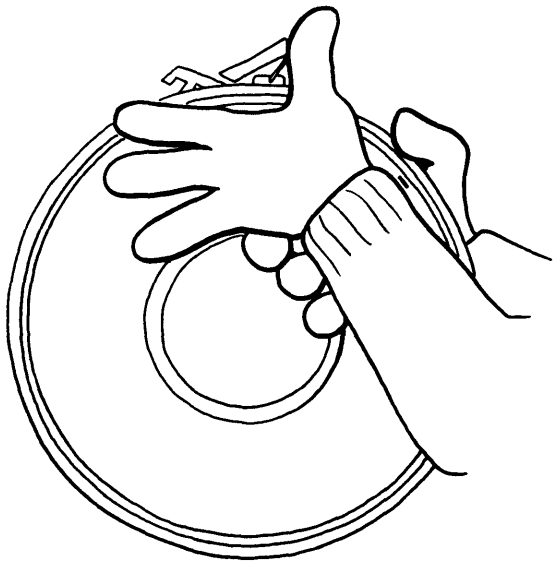
Step Seven: Remove The Tape

When the tape stops moving (which will happens almost immediately since you're storing only one file), press the REWIND button on the tape drive. When the tape rewinds itself off the fixed reel, open the door of the tape drive and flip the spool latch up to remove your tape. (If the spool doesn't have a latch, just remove the tape.)



Wrap the tape band around the reel to protect the tape.





Step Eight: Secure The File

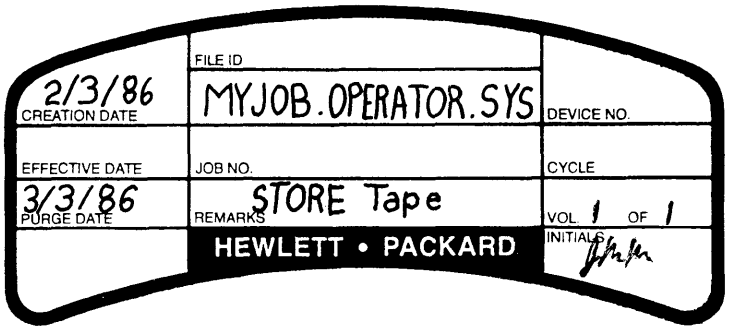
Remove the write ring from the back of the tape. This prevents anyone from copying another file onto it and destroying MYJOB.

Step Nine: Label The Tape

Label the tape with the following information:

- Today's date, under "CREATION DATE".
- The complete file name, MYJOB.OPERATOR.SYS, under "FILE ID". ("OPERATOR" is the group the file belongs to, and "SYS" is your account.)
- Any remarks about the tape, under "REMARKS". Since you created this tape with the STORE command, indicate that it is a STORE tape.
- The number of tapes needed to store the file. Since you're using just one tape, write "VOL 1 OF 1" to indicate that there's only one tape in the set. In the future you may need two or three tapes (if, for example, you're storing everyone's files).
- Your name or initials, under "INITIALS".
- When the tape will become outdated (which is when the files it contains can be safely destroyed) under "PURGE DATE". If the files will be valuable for an indefinite period of time, write "DO NOT SCRATCH" on the label.

Your tape label should look something like this:



Step Ten: Get Your Printed Report

The description of the stored files that you saw on your Console is also produced in a report. Get the report from your printer and either keep it in a folder for your records or attach it directly to the tape. This way, you'll always know what files a particular STORE tape contains.

Put the tape in a safe location, with other STORE tapes (if you have any). You'll use this tape again when you learn how to transfer files from a tape to the computer in Chapter Six.

Storing All Of Your Files Onto A Reel Tape

Your computer identity is made up of three parts:

```
OPERATOR.SYS,OPERATOR
    ↑       ↑       ↑
  user    account  group
  name    name     name
```

Your files belong to the OPERATOR group in the SYS account. That's why the complete name of your job file MYJOB is this:

```
MYJOB.OPERATOR.SYS
   ↑       ↑       ↑
 file    group   account
 name    name    name
```

In the previous section, you copied one file onto a tape. The next example, a more realistic use of the STORE command, gives you directions for copying all of your files onto a tape. You'll follow the same steps, with one difference: this time, you'll use the wildcard character, "@", to command the computer to store a specific set of files, not just MYJOB:

```
@.OPERATOR.SYS
↑        ↑        ↑
"all files"  "in the      "in the SYS account"
             OPERATOR
             group"
```

To copy all the files in the OPERATOR group of the SYS account, follow the brief recap of Steps One through Ten, below. If you need help, refer to the original version of each step, beginning on page 5-22.

1. Select a reel tape. DON'T use the one you just created because you'll use it again in Chapter Six.
2. Put a write ring on the tape.
3. Mount the reel on the tape drive and put the tape drive online.

   Type: **FILE T;DEV=TAPE** Return

   and: **STORE @.@.ACCOUNT;*T;**

   and: **SHOW=OFFLINE** Return
4. If you forgot to put a write ring on the tape, remove the tape from the drive and go back to step 2.
5. If a tape request appears on the Console, answer it.

   Hold down CTRL and type: **A**

   Type: **REPLY nn,n** Return

   (substitute your PIN) ↑ ↑ *(substitute your LDEV number)*

   Watch the Console for a report of the stored files. This may take a few seconds or a few minutes, depending upon how many files you're copying. When you see "FILES STORED: nn" (indicating that the store procedure is complete), go to the next step.

6. Press REWIND. When the tape stops spinning, open the door of the drive, remove the tape, and put a tape band around the reel.
7. Take the write ring off the tape.
9. Label the tape.
10. Get your printed report and attach it to the tape or put it in a folder for your records.

Storing Other Users' Files Onto Reel Tape

So far, you've copied one of your files as well as a group of your files onto tape. But, can you store files belonging to other computer users?

The answer is yes, IF you've been assigned OP, or "System Supervisor", capability. If you're not sure, check your cabilities on page 1-2. If you didn't write them down, read "What Capabilities Is OPERATOR.SYS Assigned?" in Chapter One to find out.

IMPORTANT

To copy other users' files, you must give the computer a complete file description, including the file name, group name, and account name. To copy a group of files, substitute the wildcard character, "@", in place of all or part of the description. (For example, "@.@.@" describes all computer files.) For more information, refer to the description of the STORE command in the MPE V/R Commands Reference Manual (Part Number 32033-90006).

To store other user's files, follow Steps One through Three to select, prepare, and mount a tape reel onto the drive. Then type the FILE command:

Type: `FILE T;DEV=TAPE` Return

Next, tell the computer what files to copy to the tape. For example, you might want to store all the files in the PUB group of the SYS account. Use the wildcard character, "@", to indicate "all files", then specify the group name and account name, like this:

Type: `STORE @.PUB.SYS;*T;SHOW=OFFLINE` Return

At this point, you'll either see a tape request on the Console or a description of the files as they're copied to the tape. Continue with Steps Five through Ten to respond to the tape request and handle the finished tape.

For More Information

To learn more about storing files onto tape, refer to:

- MPE V/R System Operation and Resource Management Reference Manual (Part Number 32033-90005). It includes an introduction on using commands.
- MPE V/R Commands Reference Manual (Part Number 32033-90006). It includes information on the STORE command.

The FCOPY utility offers another method of storing files. There is no discussion on FCOPY in this manual, but if you wish to learn about it, refer to:

- FCOPY Reference Manual (Part Number 03000-90064).

Looking Back

1. Why do you store files onto tape?

2. What must you do to a cartridge tape to store files onto it? What must you do to a magnetic tape reel?

3. What two commands must you type to store a file onto the tape?

4. What information should you write down on a tape label? Why is the label important?

5. When you're finished copying files onto the tape, what do you do to a cartridge tape to protect them? What do you do to protect the files on a reel tape?

Storing Files Quick Reference

To Do:	Do This:
To store files onto tape:	1. Select a tape. 2. Prepare the tape. Point the arrow on a cartridge tape away from SAFE; insert a write ring into a reel tape. 3. Insert/mount the tape: on a cartridge tape drive, wait for the BUSY light to go out; on a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons. 4. Type in the commands. If using cartridge tapes, type: FILE T;DEV=CTAPE [Return] If using reel tapes, type: FILE T;DEV=TAPE [Return] 5. For both, type: STORE *(file description)* ;*T;SHOW=OFFLINE [Return] 6. Reply to the tape request if one appears. Hold down [CTRL] and type: A Type: REPLY nn,n,Y [Return] *(the PIN)* ↑ ↑ *(the LDEV number)* 7. Remove the tape: on a reel tape drive, press REWIND to rewind the tape, then take the reel off the drive. (Cartridge tapes rewind automatically.) 8. Secure the file: on a cartridge tape, turn the arrow towards SAFE; on a reel tape, remove the write ring. 9. Label the tape. 10. Get your printed report.

Introduction To Chapter Six

This chapter teaches you how to transfer files that have been copied onto a STORE tape to your computer's disc. Transferring files from tape, called "restoring" files, is the complement to the procedure you learned in Chapter Five, storing files.

It would be pointless to store files on a tape for safekeeping if you couldn't transfer them back to your computer. In some cases, your tape may contain the only existing copy of a file. For example, a user accidentally could purge the original from the disc. Or, you could copy important but infrequently used files onto a tape and intentionally remove them from the disc.

This chapter explains, in separate sections, how to restore files using cartridge tapes and reel tapes. In each section, you'll learn the procedure by restoring the files that you copied to tape in Chapter Five.

Each of the two sections explains three ways to restore files:

- In the first example, you'll transfer everything on the tape, whether or not the file(s) already exist on your computer's disc.
- In the second example, you'll command the computer to transfer only those files that it doesn't have copies of; any duplicates won't be restored.
- In a third example, you'll copy files belonging to another user into your group and account.

At the end of the chapter, the difference between restoring your own files and helping others restore theirs is explained. You'll also learn how to tell someone that the tape drive is temporarily unavailable.

6 Restoring Files

Preparing To Restore Your Files

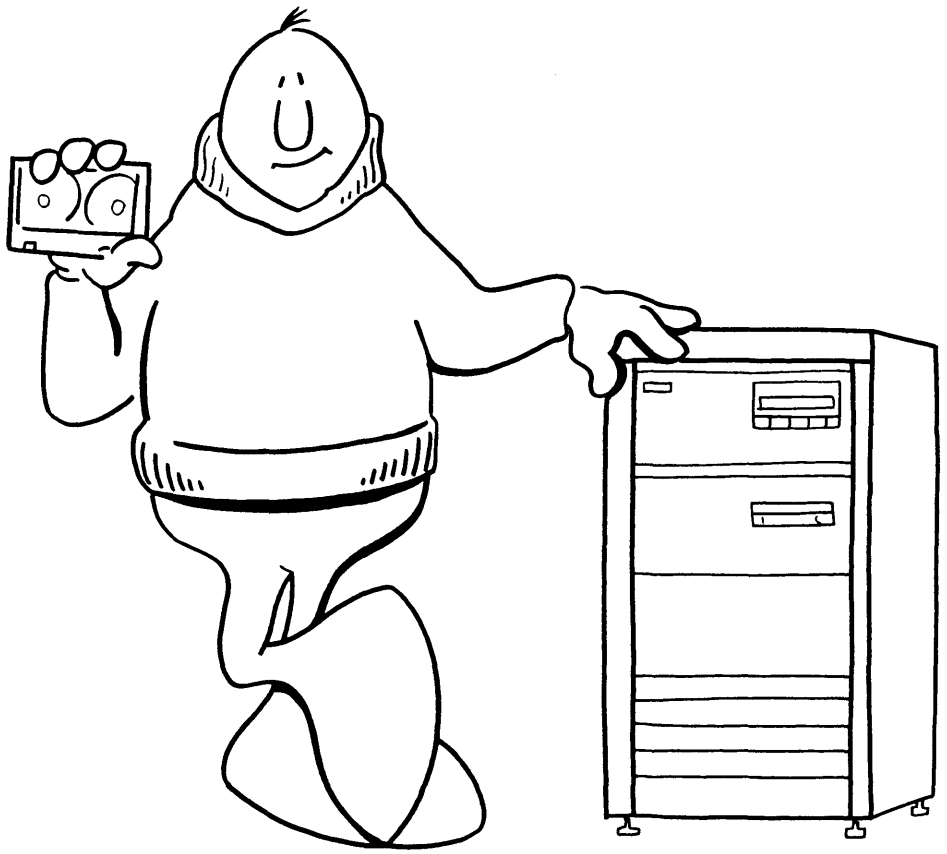
To transfer one or more files from tape onto your computer, you need two things:

- A STORE tape.
- Information about the files it contains. Specifically, you need to know whether or not the files on tape already exist in the computer, and what to do about it if they do.

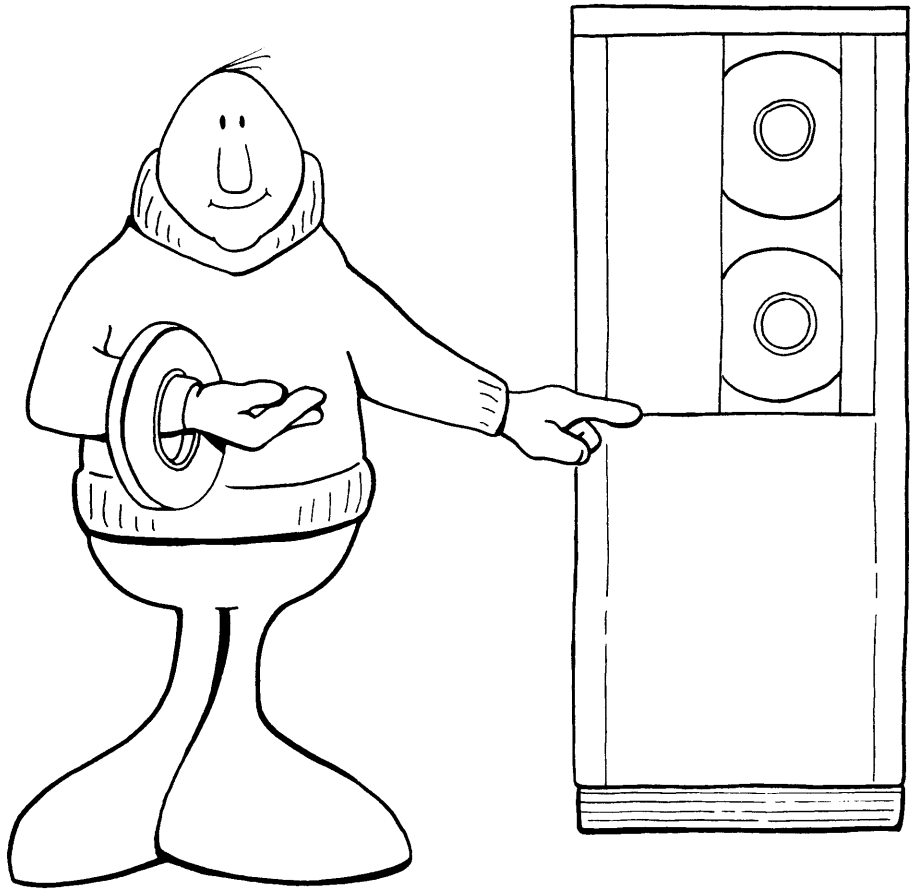
Select A STORE Tape

A STORE tape is a tape created with the STORE command. It should be clearly labelled, like this:

The tape itself can be either a cartridge or reel tape. To transfer files stored on a cartridge tape to the computer, you'll use a cartridge tape drive.



To transfer files stored on a reel tape to the computer, you'll use a reel-to-reel tape drive.



To learn how to restore, or transfer, files from tape to the computer, use the first STORE tape you created in Chapter Five. Check the "FILE ID" on the tape's label to make sure it says "MYJOB.OPERATOR.SYS"

IMPORTANT

You must have a STORE tape to complete the examples in this chapter. If you don't have one and you're using cartridge tapes, read "Storing A File Onto Cartridge Tape" in the first half of Chapter Five. If you're using reel tapes, read "Storing A File Onto Reel Tape", in the second half of Chapter Five.

Check The Files You Intend To Restore

Before you transfer the file(s) from your STORE tape to the computer, find out if there are any files of the same name already stored on your computer's disc.

Type: **LISTF,1** Return

The computer responds by printing a list of your files in alphabetical order. At the top of the list, you'll see the account and group the files belong to, like this:

```
ACCOUNT= SYS                GROUP= OPERATOR

FILENAME    CODE ------------LOGICAL RECORD-------------
                    SIZE   TYP         EOF          LIMIT

MYJOB                80B    FA         72             72

                        (and some other files)
```

Compare the list on the Console to the files described on the STORE tape's label. Check the group name and account name as well as the file name. All three must match; otherwise, the file name isn't an exact duplicate.

If there are any duplicate names, you'll replace the files in your computer with those on the tape. That's okay if the copy on tape and the copy on disc are exactly the same (which is the case with MYJOB). But, if you have two different versions of the same file, or two different files with exactly the same name, make sure you know which file you want.

IMPORTANT

As a general rule, you're better off keeping the disc file. That's because until you get rid of the STORE tape, you'll have both files: the one on disc and the file (of the same name) on tape.

If your STORE tape contains a mixture of files, you can tell the computer to restore only those that have unique file names. To find out how, read "Restoring Specific Files From Your Cartridge Tape", on page 6-12.

If you're restoring files from a cartridge tape, read the next section. If you're restoring files from a reel tape, go to page 6-14.

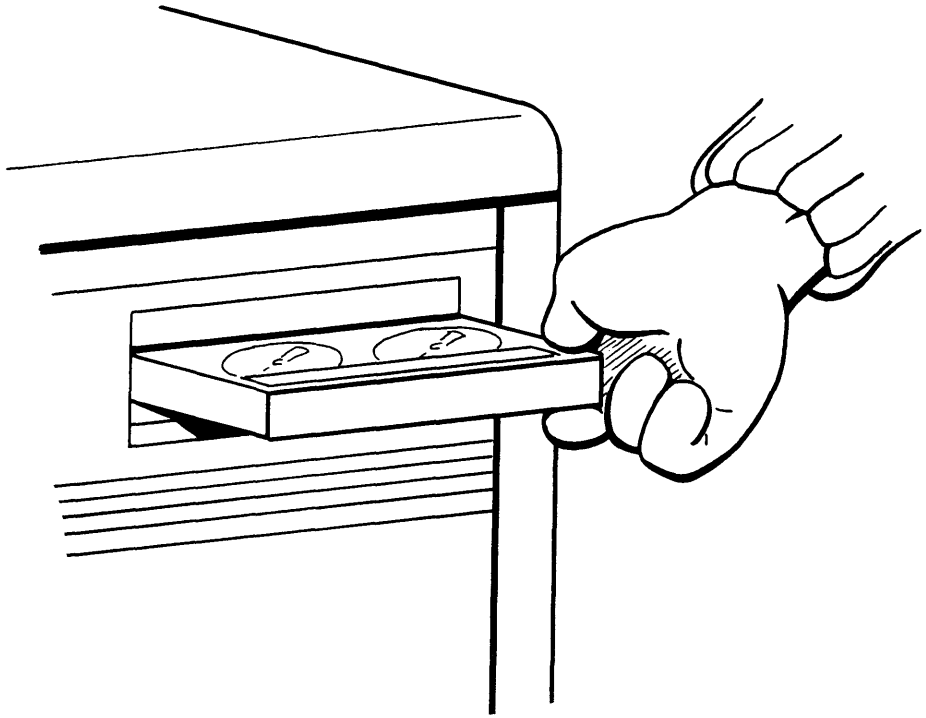
Restoring All Files From A Cartridge Tape

You should now have a cartridge STORE tape in hand. You should also be certain that the file(s) you'll transfer to the computer won't replace any files of the same name that you want to keep.

When you've completed Steps One through Five, below, the file(s) on your STORE tape will be copied to your computer's disc. You'll also get a printed description of the file(s) to keep for your records.

Step One: Insert The Tape

Insert the tape into the cartridge tape drive as shown:



IMPORTANT

Wondering why you weren't asked to check the SAFE arrow on the tape cartridge? Simple: the "safety", of the information only matters when you're copying files to the tape.

Check the BUSY light on the front of the tape drive. It should be on, and may stay on for up to two minutes. When you're waiting, this seems like a long time.

If the PROTECT light also comes on, don't worry. It just means that the arrow on the tape is pointed towards SAFE so that nothing can be copied to it. But, since you're transferring information from the tape to your computer's disc, it doesn't matter.

When the light goes out, check your Console for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV nn
                (a number; check your screen) ↑
```

The computer sends you this message to let you know that the tape has been inserted ("MOUNTED") into the tape drive. Remember the number in the message. It's the LDEV number of your tape drive, which you'll use to respond to the tape request in Step Three.

IMPORTANT

Check Chapter One, page 1-2, to see if you have already recorded the LDEV number of your tape drive. If not, write it down now. Throughout this chapter and in the remainder of the Guide, you'll be referred back to page 1-2 when you need your tape drive's LDEV number.

Step Two: Tell The Computer To Restore The File(s)

Type: `FILE T;DEV=CTAPE` Return

and: `RESTORE *T;@.@.@;SHOW=OFFLINE` Return

("restore everything on the tape") ↑ ↑ *("print a description of the restored files")*

If you mistype anything, the computer responds with an error message. Don't worry, just type the commands again. When you type the information correctly, you'll see a message similar to this:

```
STORE/RESTORE, VERSION 2 (C) 1981   HEWLETT-PACKARD CO.
WED, DEC 5, 1985, 9:08 AM
```

Next, you'll see one of two messages. If you've restored the file, you'll see a description of it like the one below, and you can skip to Step Four on page 6-10.

```
WILL RESTORE         1 FILES;  NUMBER OF FILES ON TAPE =   1

FILENAME.GROUP   .ACCOUNT   LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS         1%00114351    1        2

FILES RESTORED:          1
```

Otherwise, the computer responds to the STORE command by displaying a tape request on the Console, like this:

```
?9:08/#S25/43/LDEV# FOR "T" ON CTAPE (NUM),WRITE RING? (Y/N)
```

Step Three: Respond To The Tape Request

To answer a tape request, you must know:

- The LDEV number of your tape drive. This number appeared in the "VOLUME MOUNTED" message that was printed on the Console when you inserted the tape in Step One.
- The process identification number, or PIN, which is part of the tape request.

```
?9:08/#S25/43/LDEV# FOR "T" ON CTAPE (NUM),WRITE  RING? (Y/N)
            ↑ (the PIN; yours may be different)
```

If the request rolled up off the screen to make room for other Console messages, ask the computer to show it to you again:

Hold down [CTRL] and type: **A**

Type: **RECALL** [Return]

Your tape request, and any others still "pending", will be displayed.

Use the PIN in your message and the LDEV number of your tape drive to answer the tape request.

Hold down CTRL and type: A

Type: REPLY nn,n Return
(use your PIN) ↑ ↑ *(use your LDEV number)*

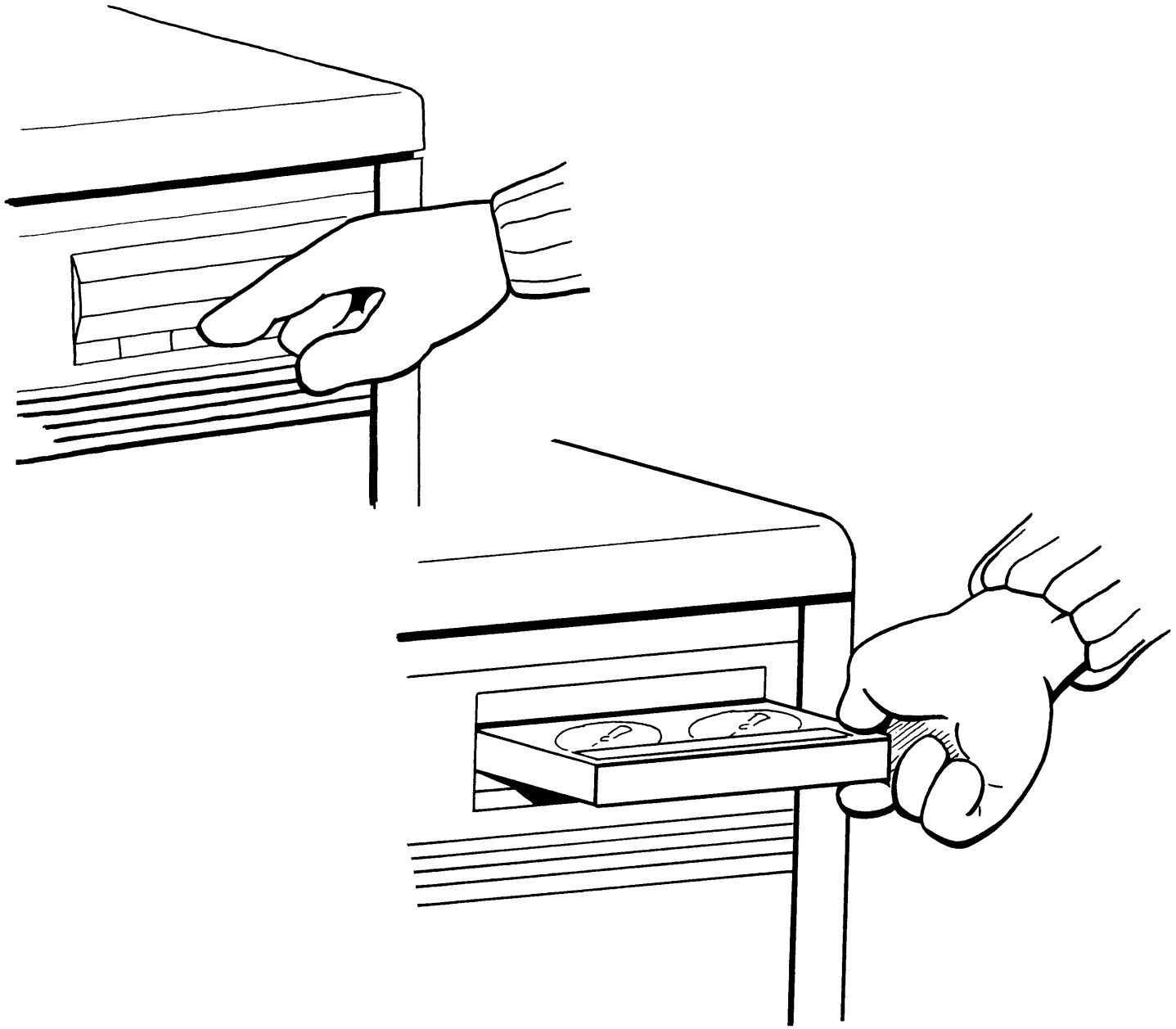
When the computer begins restoring the file(s), the BUSY light on the tape drive will light up. Check your Console. When the file has been transferred to the computer, you'll see a description of it like this:

```
WILL RESTORE        1 FILES;  NUMBER OF FILES ON TAPE =   1

FILENAME.GROUP   .ACCOUNT   LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS         1%00114351    1        2

FILES RESTORED:          1
```

If the tape contained more than one file, and you were restoring some or all of them, each one would be listed individually, and the total number reported on the last line.

Step Four: Remove The Tape

Check the BUSY light on the front of the tape drive. It stays on while the tape is rewinding, which could take up to two minutes. When the BUSY light goes out, press the button directly below the tape compartment to eject the tape. Remove the tape.



Step Five: Get Your Printed Report

Go to your printer and pick up the printed description of the restored files; you may keep it for your records.

If you no longer need the STORE tape, remove the label and put it with the other reusable ("scratch") tapes.

Restoring Specific Files From Your Cartridge Tape

If your STORE tape contains some files already stored in the computer disc, and some that aren't, you can restore just the ones that aren't. You'll use the procedure described above except that you must command the computer to keep the files already stored on your computer's disc.

Select a STORE tape that contains files from your own group (OPERATOR) and account (SYS). Use the following recap of Steps One through Five to restore only those files that don't already exist on the computer's disc. (The new instructions are in the second step.)

1. Insert the tape into the drive.
2. Tell the computer to restore the files.

   Type: `FILE T;DEV=CTAPE` Return

   and: `RESTORE *T;@.@.@;KEEP;`

   and: `SHOW=OFFLINE` Return

   IMPORTANT

   Adding "KEEP" to the RESTORE command tells the computer not to replace files already on the disc with the duplicates on tape. At the same time, all files that the computer doesn't have are transferred to the disc.

3. Respond to the tape request, if one appears on the Console.
4. Remove the tape.
5. Get the printed report.

Restoring Other User's Files Into Your Own Group And Account Using Cartridge Tapes

If you're assigned OP, or "System Supervisor", capability, you can copy files that belong to someone else into your own group and account. Check your capabilities on page 1-2. If you didn't record them, refer to "What Capabilities Is OPERATOR.SYS Assigned?" in Chapter One.

You'll use the same basic steps for restoring a file summarized above, and explained in detail on pages 6-6 through 6-11. The only difference is in the RESTORE command, as you'll see in the second step, below.

1. Insert the tape into the drive.
2. Tell the computer to store the files.

   Type: FILE T;DEV=CTAPE Return

   ("copy the files into my group") ↓

   and: RESTORE *T;@.@.@;GROUP=OPERATOR;

   and: ACCT=SYS;SHOW=OFFLINE Return

   ↑ *("and into the SYS account")*
3. Respond to the tape request, if one appears on the Console.
4. Wait for the BUSY light to go out, then remove the tape. You can either keep it, or remove the label and put it with other scratch tapes.
5. Get the printed report.

To check that the files on tape now belong to you (in the OPERATOR group of the SYS account), ask the computer for a list of your files:

Type: LISTF,1 Return

Your list of files should now include those you just transferred from the STORE tape to the computer.

Since part of your job is controlling the use of the tape drive, you'll frequently be asked to help other users restore their files. To learn how, read "When Users Want To Restore Files" on page 6-26.

Restoring All Files From A Reel Tape

If you've read the first part of this chapter, you should have in hand a reel tape containing files copied onto it with the STORE command. You should also know that the file(s) you'll transfer to the computer won't replace any files of the same name that you want to keep. If you're restoring MYJOB, don't worry; the tape copy and the computer copy are exactly the same anyway. But, if you're restoring another file, and you're not sure, read "Check The Files You Intend To Restore" on page 6-4.

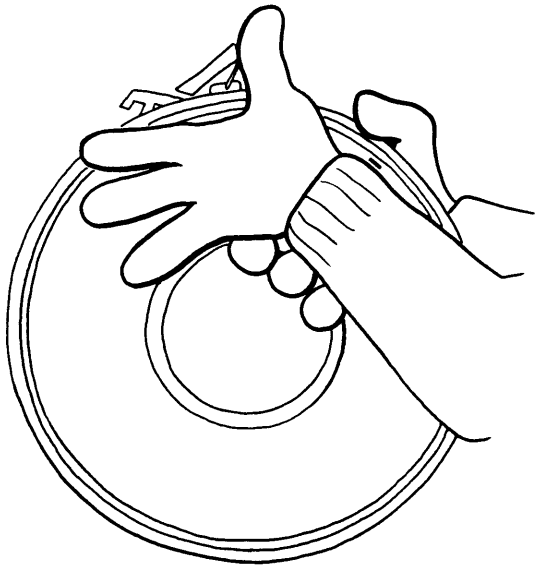
When you've completed Steps One through Six, below, the file(s) on your STORE tape will be stored on your computer's disc. You'll also get a printed description of the file(s) to keep for your records.

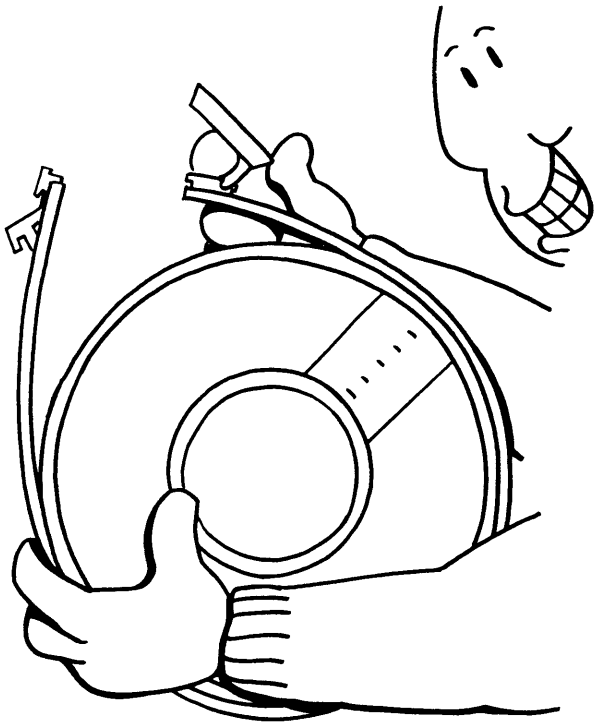
IMPORTANT

If you've just finished reading about cartridge tapes, skim through what you know, but pay particular attention to tape handling instructions (Steps One and Two) and the commands (Step Three).

Step One: Prepare The Tape

Reel tapes are protected by a plastic band that wraps around the reel. Unlatch the band and remove it.

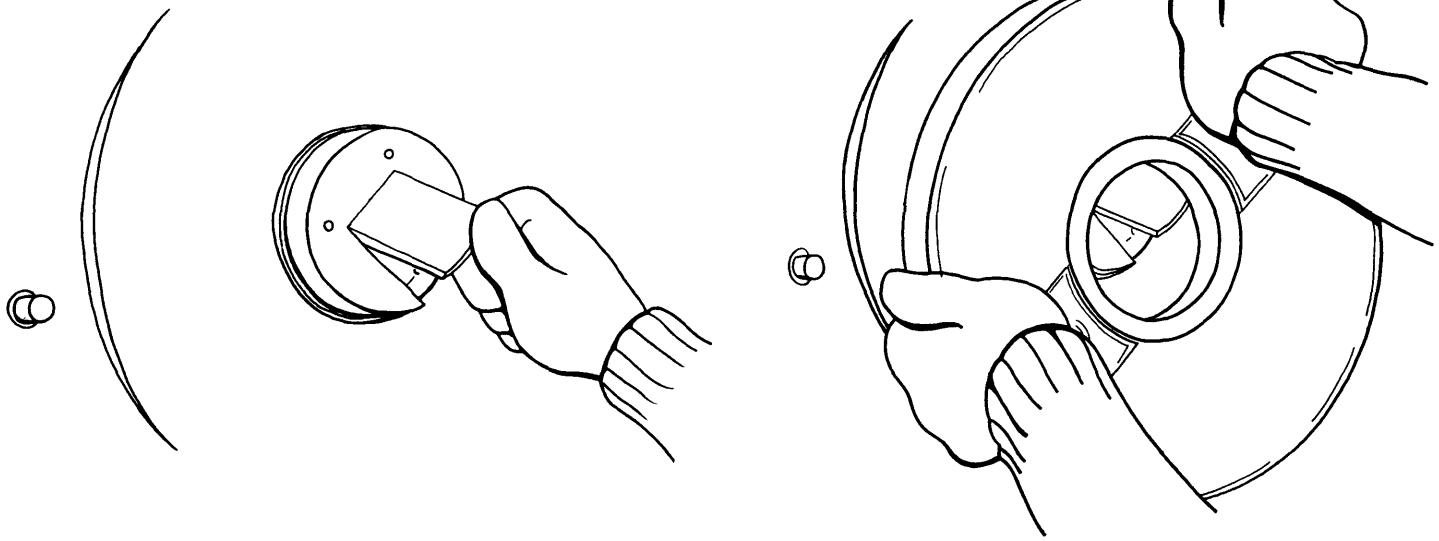




Step Two: Mount The Tape And Prepare The Tape Drive

Open the door of your tape drive. You'll see two spools, one without a reel, and one containing an empty, permanently fixed reel. If the spool without a reel has a latch, flip the latch up.

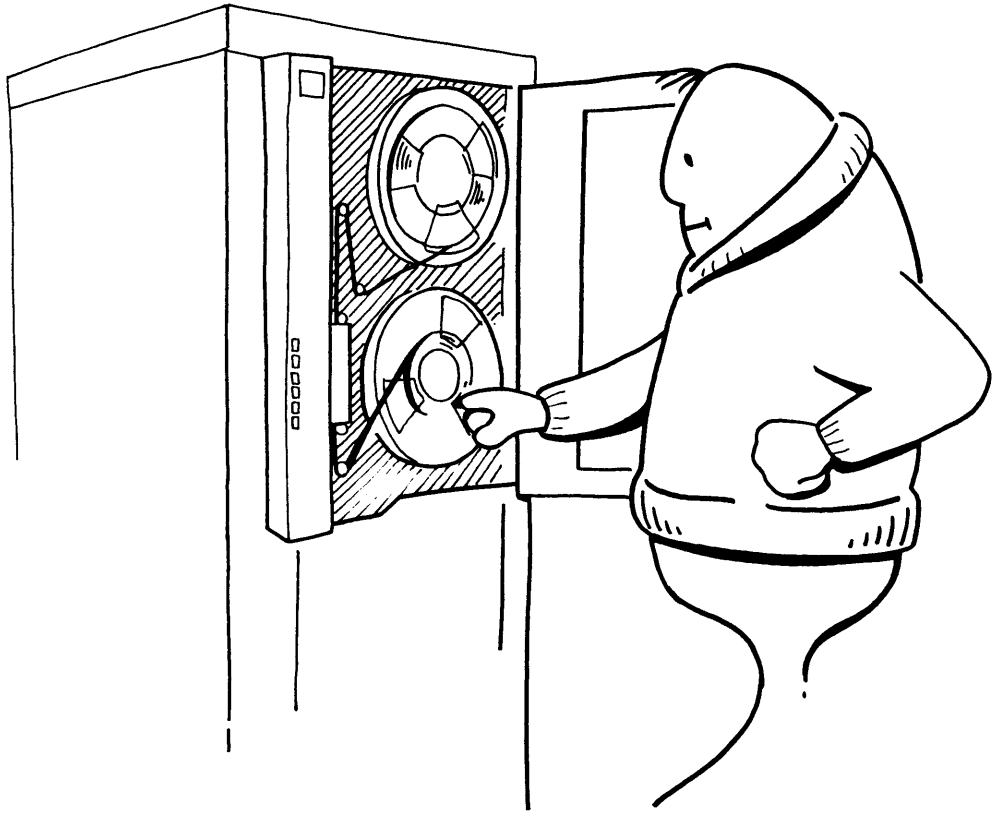
Fit the tape reel onto this spool so that the side with the write ring is placed against the tape drive. The reel will fit snugly onto the spool.



If there is a latch on the spool, flip it down to lock the reel in place.

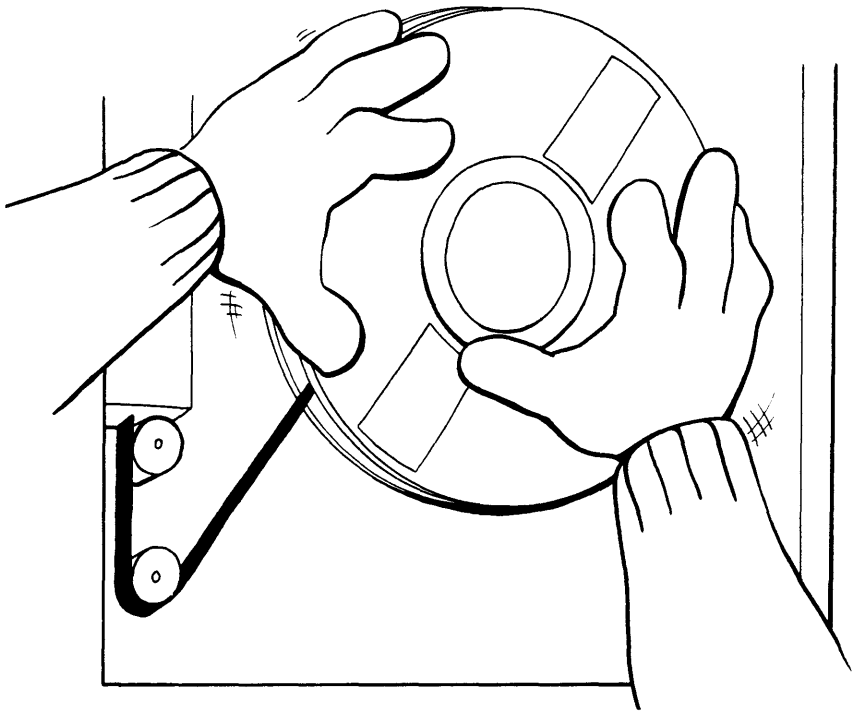
Next, unwind about four feet of tape from the reel. (This makes it easier to thread the tape, and you won't hurt anything. The first several feet of tape is "leader", and contains no information.)

Thread the tape around the pulleys using the diagram on the tape drive as a guide.



When the tape is threaded around the pulleys, pull the free end up and over the top of the empty reel in a clockwise direction. Don't worry if the tape is a little bit loose.

Hold the end of the tape in place on the empty reel, and turn the reel clockwise. Rotate the reel a few times so that the free end won't come off the reel. Check the tension on the tape. If turning one spool by hand also turns the other spool, the tape is mounted securely.



Shut the door of your tape drive. Next, press the LOAD button, then the ONLINE button on the tape drive. The tape will begin to spin. When it stops, go back to the Console and check for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV# nn
                (a number; check your screen) ↑
```

Remember the number in the message. It's the LDEV number of your tape drive, which you'll use to respond to the tape request in Step Four.

Step Three: Tell The Computer To Restore Your File(s)

Type: **FILE T;DEV=TAPE** Return

and: **RESTORE *T;@.@.@;SHOW=OFFLINE** Return

("restore all files on the tape") ↑ ↑ *("print a description of the restored files")*

If you mistype anything, the computer responds with an error message. Don't worry, just try the commmands again. When you type the information correctly, you will see a message similar to this:

```
STORE/RESTORE, VERSION 2 (C) 1981   HEWLETT-PACKARD CO.
WED, DEC 5, 1985, 9:17 AM
```

Almost immediately, one of two messages will appear on your screen. If you see a description of your file(s) like the one below, it means that you've successfully restored the file(s), and you can skip to Step Five on page 6-21.

```
WILL RESTORE        1 FILES;  NUMBER OF FILES ON TAPE =   1

FILENAME.GROUP   .ACCOUNT   LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS         1%00114351    1        2

FILES STORED:          1
```

Otherwise, the computer responds by displaying a tape request on the Console, like this:

```
?12:02/#S54/12/LDEV# FOR "T" ON TAPE (NUM),WRITE RING? (Y/N)
```

Step Four: Respond To The Tape Request

To answer a tape request, you must know:

- The LDEV Number of your tape drive. This number appeared in the "VOLUME MOUNTED" message that was printed on the Console when you inserted the tape in Step Four.
- The process identification number, or PIN, which is part of the tape request.

```
?12:02/#S54/12/LDEV# FOR "T" ON TAPE (NUM),WRITE  RING? (Y/N)
          ↑ (the PIN; yours may be different)
```

If the request rolled up off the screen to make room for other Console messages, ask the computer to show it to you again. The computer will display your tape request, along with any others that are still "pending".

Hold down CTRL and type: A

At the "=" prompt, type: RECALL Return

Use the PIN in your message and the LDEV number of your tape drive to answer the tape request.

Hold down CTRL and type: A

At the "=" prompt, type: REPLY nn,n Return

(use your PIN) ↑ ↑ *(use your LDEV number)*

When the computer begins restoring the file(s), the tape will move. If you're copying only one file, it will move just for a second or so, then stop.

Check your Console. When the transfer is complete, you'll see a description of the file like this:

```
WILL RESTORE        1 FILES;  NUMBER OF FILES ON TAPE =   1

FILENAME.GROUP   .ACCOUNT   LDN  ADDRESS REEL  SECTORS CODE

MYJOB    .OPERATOR.SYS         1%00114351    1        2

FILES STORED:          1
```

If you're restoring several files, each one would be listed individually, and the total number reported on the last line.

Step Five: Remove The Tape

When the tape stops moving (which happens almost immediately when you're restoring only one file) press the REWIND button on the tape drive. When the tape rewinds itself off the fixed reel, open the door of the tape drive and flip the latch up to remove your tape. (If the spool doesn't have a latch, just remove the tape.)

Wrap the tape band around the reel to protect the tape. Then, if you don't need it any more, put it with the other scratch tapes.

Step Six: Get Your Printed Report

Go to the printer and pick up the report describing the restored files. You may want to keep it for your records.

Restoring Specific Files From Your Reel Tape

If your STORE tape contains files already stored in the computer, and some that aren't, you can restore just the ones that aren't. You'll use the same procedure that you used to transfer all the files, except that you must command the computer to keep the files already stored on your computer's disc.

Select a STORE tape that contains files from your own group (OPERATOR) and account (SYS). Use the brief recap of the steps you just followed to restore only those files that don't already exist on the computer's disc. (The new instructions are in the second step.)

1. Mount the tape and prepare the tape drive.
2. Tell the computer to restore the files.

   Type: `FILE T;DEV=TAPE` Return

   and: `RESTORE *T;@.@.@;KEEP;`

   and: `SHOW=OFFLINE` Return

   IMPORTANT

   Adding "KEEP" to the RESTORE command tells the computer not to replace files already on the disc with the duplicates on tape. At the same time, all files that the computer doesn't have are transferred to the disc.

3. Respond to the tape request, if you see one.
4. Rewind and remove the tape; replace the tape band around the reel.
5. Get the printed report.

Restoring Other User's Files Into Your Own Group And Account Using Reel Tapes

If you're assigned OP, or "System Supervisor", capability, you can copy files that belong to someone else into your own group and account. Check your capabilities on page 1-2. If you didn't record them, refer to "What Capabilities Is OPERATOR.SYS Assigned?" in Chapter One.

Follow Steps One through Five, as you did before, with one difference. In the second step, tell the computer to restore the files into your group and account.

1. Mount the tape and prepare the tape drive.
2. Tell the computer to store the files.

   Type: `FILE T;DEV=TAPE` Return

   ("copy the files into my group") ↓

   and: `RESTORE *T;@.@.@;GROUP=OPERATOR;`

   and: `ACCT=SYS;SHOW=OFFLINE` Return

   ↑ ("and into the SYS account")
3. Respond to the tape request, if one appears on the Console.
4. Rewind and remove the tape; place the tape band around the reel.
5. Get the printed report.

To check that the files on tape now belong to you (in the OPERATOR group of the SYS account), ask the computer for a list of your files:

Type: `LISTF,1` Return

Your list of files should now include those you just transferred from the STORE tape to the computer.

When Users Want To Restore Files

Regardless who needs the tape drive, you control its use. This includes:

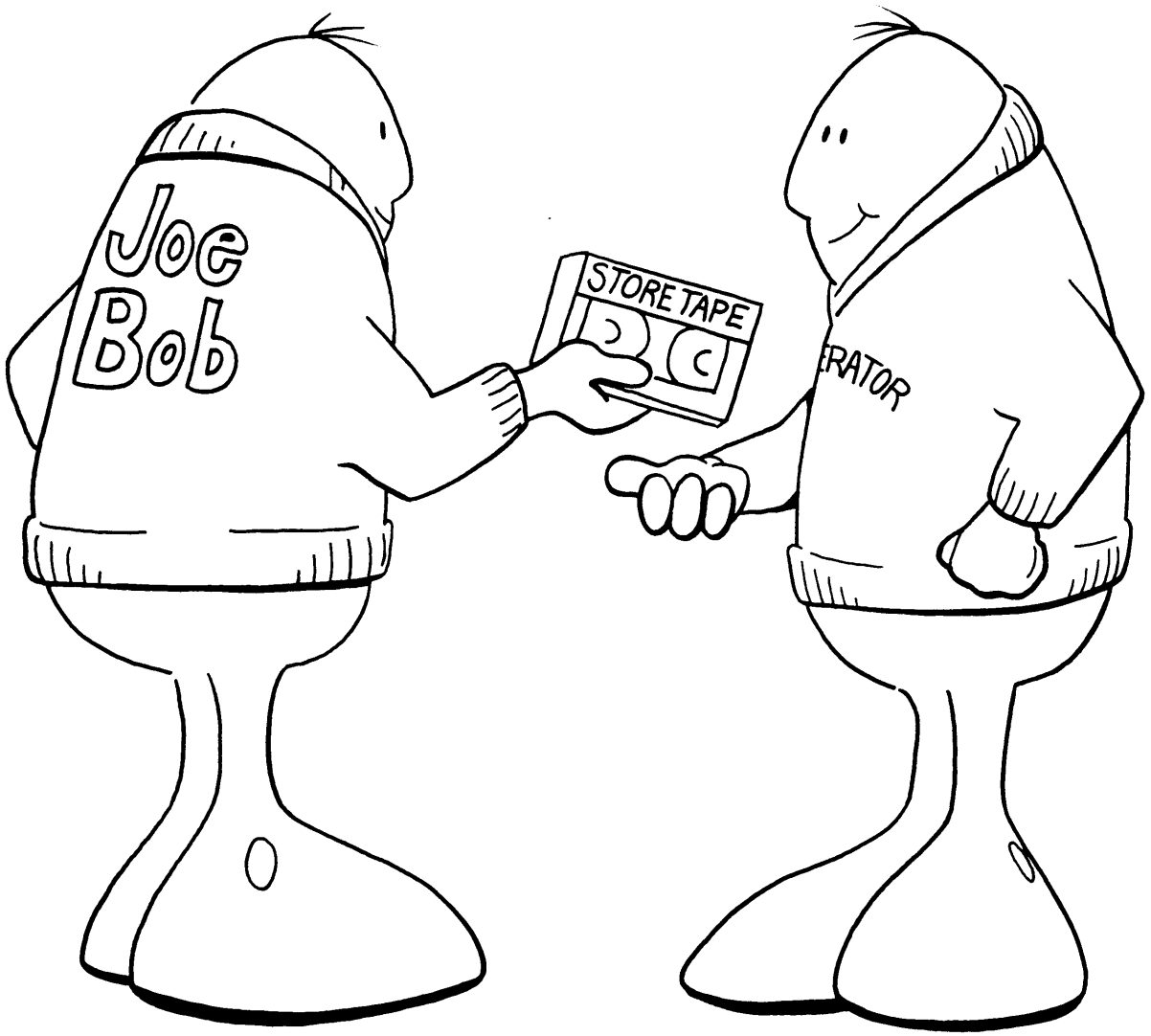
- Watching the Console for tape requests.
- Mounting or inserting tapes and preparing the tape drive.
- Responding to tape requests.
- Removing the tapes when the file transfer is complete.
- Getting the reports from the printer and distributing them to users.

In this chapter, you've learned to restore your own files using a STORE tape that you selected. More often than not, though, you'll be helping someone else restore their files. The procedure is similar, except that you and the user will be working together.

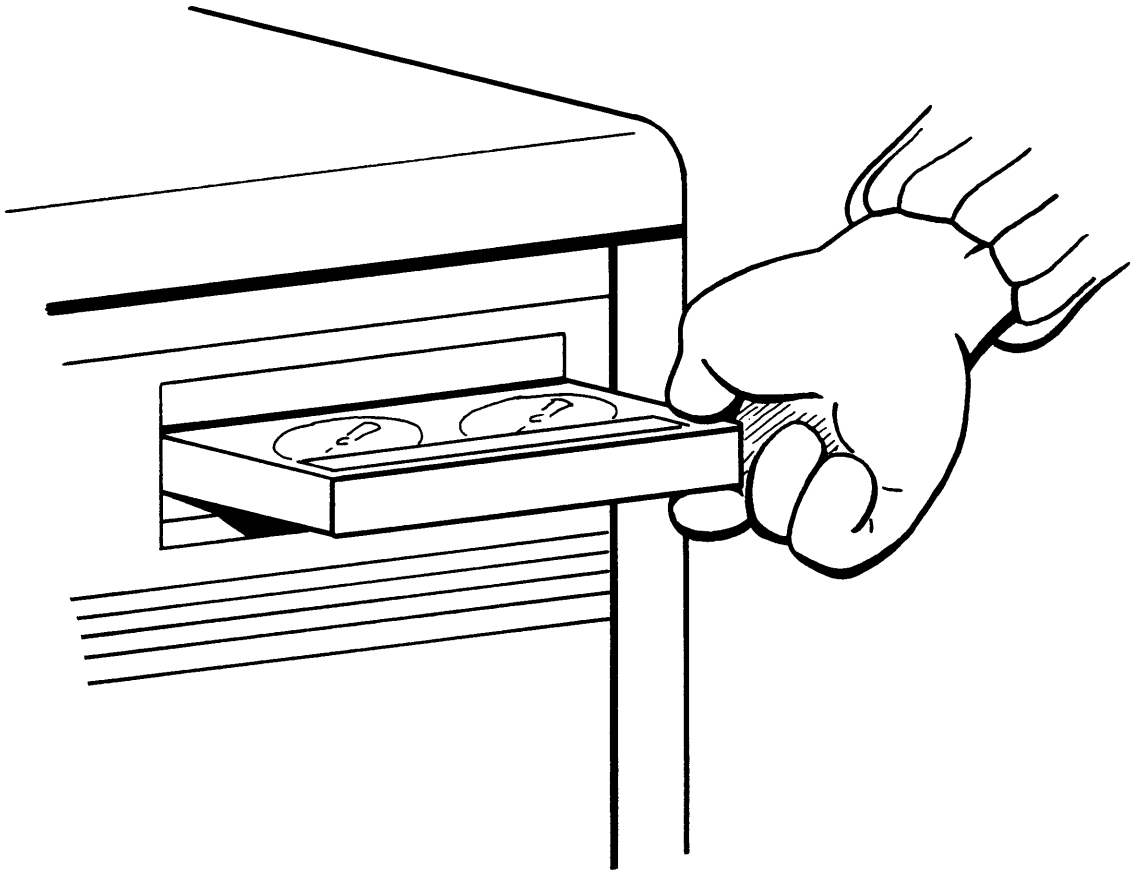
Working With The User: Who Does What?

The steps below describe how you and a computer user might work together to restore some files. The order of the steps may vary. For example, you may see a tape request on the Console before the user hands you the STORE tape. Don't worry. This is intended to give you a general feel for the process, and not a precise set of rules.

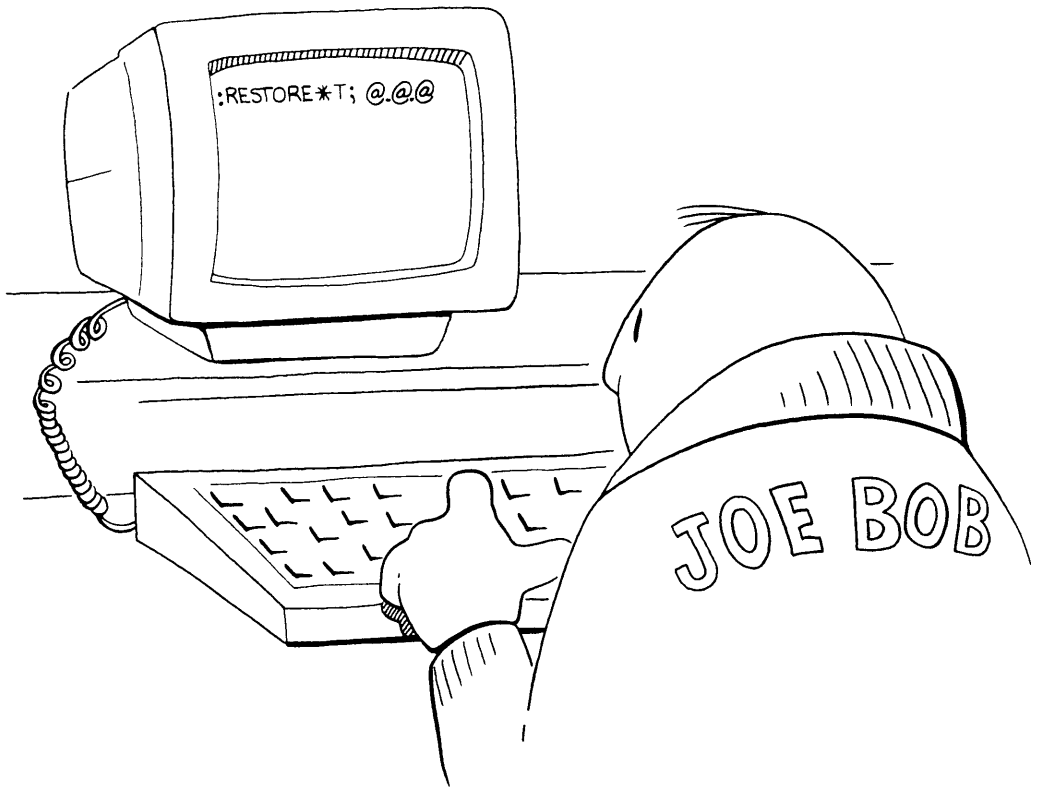
First, the user gives you a STORE tape containing the files that he or she wants transferred to the computer.



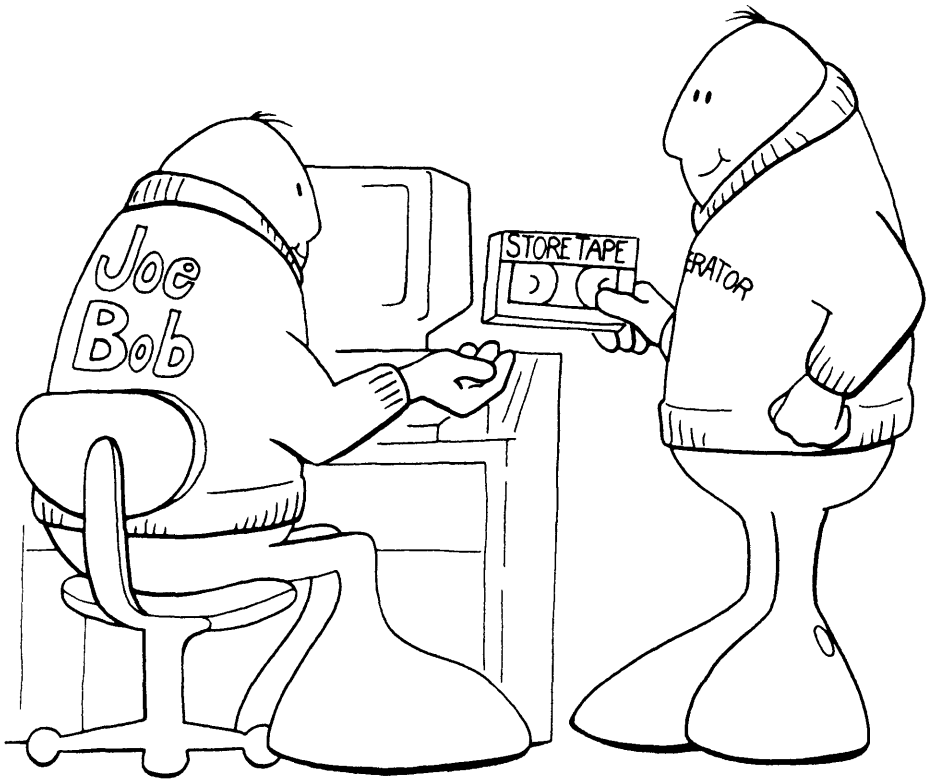
Then, you mount or insert the tape and prepare the tape drive. When the tape is ready, you'll see a "VOLUME MOUNTED" message on the Console. Remember, the message tells you the LDEV number of your tape drive, which you'll need to respond the the tape request.



The user goes back to his or her terminal and types the FILE and RESTORE commands, and any other information the computer needs to restore the files. (For example, the user may tell the computer to keep any files that are already stored on the disc.)



You watch the Console for a tape request and answer it. Or if your computer automatically answers the request, the BUSY light on the cartridge tape drive will light up, or the tape reel will begin moving. (Since the user originated the request to restore the files, you won't see the description of the restore procedure on the Console. Instead, it's sent to the user's terminal.) When the process is complete, remove the tape and return it to the user.



As part of your regular routine of retrieving, separating, and distributing reports, you'll collect the report describing the restored files. The user will come and get this from you.

Telling The User The Tape Drive Is Unavailable

You also have the option of telling the user that the tape drive isn't available. To do so, respond to the tape request with a 0, instead of the LDEV number of your tape drive.

Type: **REPLY nn,0** Return

↑ *(use the PIN from the tape request)*

Substituting a 0 for the LDEV number of the tape drive gets rid of the request. In turn, the user receives a message at his or her terminal saying that the device (the tape drive) is unavailable.

For More Information

There are many other ways to select and copy files from tape to the computer with the RESTORE command. For example, if the files on the STORE tape belong to a group and account that your computer doesn't have, you can create the group and account as you restore the files. Or, you can transfer a specific group of files from the tape to your computer, and leave the rest.

If you want to learn more about restoring files, refer to the MPE V/R Commands Reference Manual (Part Number 32033-90008). It has a complete explanation of the RESTORE command.

The FCOPY utility offers another method of restoring files. There is no discussion of FCOPY in this manual, but if you wish to learn about it, refer to the FCOPY Reference Manual (Part Number 03000-90064).

Looking Back

1. What should you check before you copy any files on a STORE tape to your computer's disc?

2. What information do you need to respond to a tape request, and when do you do so?

3. How do you restore specific files from a tape?

4. How do you transfer files belonging to someone else from the STORE tape to your group and account?

5. When you help someone else restore their files, what things are you responsible for?

Restoring Files Quick Reference

To Do:	Do This:
Restore files:	1. Select a STORE tape. 2. Insert/mount the tape. On a cartridge tape drive, wait for the BUSY light to go out. On a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons. 3. Type in the commands. If using cartridge tapes, type: `FILE T;DEV=CTAPE` Return If using reel tapes, type: `FILE T;DEV=TAPE` Return For both, type: `RESTORE *T;@.@.@;` and: `SHOW=OFFLINE` Return 4. Reply to the tape request if one appears. Hold down CTRL and type: `A` Type: `REPLY nn,n` Return *(the PIN)* ↑ ↑ *(the LDEV number)* 5. Remove the tape. On a reel tape drive, press REWIND to rewind the tape, then take the reel off the drive. (Cartridge tapes rewind automatically.) 6. Get your printed report.

Introduction To Chapter Seven

Chapter Five taught you how to copy specific files onto a tape with the STORE command. Although you will occasionally duplicate files this way, as the System Operator, you have a more important job: creating, according to a prescribed schedule, a backup copy of your computer's files.

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 in your computer onto cartridge or reel tapes. This process is known as "system backup". "Backing up" the system may be the most important part of your job. The backup tapes you create are your company's insurance policy against losing valuable computer data. If a file is ever irreparably damaged or accidentally erased, you'll have a duplicate copy on tape that can be transferred to the computer's disc.

Backup tapes contain:

- Files belonging to all users, such as reports, memos, programs, and data.
- The operating system and other software that the computer uses to manage your files and coordinate all of its functions.

You'll use two command to create backup tapes: PARTBACKUP, which duplicates only those files that have been changed or added to your computer since the last complete backup, and FULLBACKUP, which duplicates all user files. You'll learn how to create a special "coldload" tape that can be used to restart your computer system.

7 System Backup

If You're New But The Computer Isn't

If you've just joined your company's computer operations staff, find out what backup procedures have already been established for your computer. Your System Manager or an experienced Operator will be able to answer the questions listed below. If the terms and concepts in the questions are unfamiliar, read the section which follows them for information only.

- Where is your computer's tape library located?
- How are backup tapes organized?
- Where are the blank tapes you'll use for backups?
- When do you do a partial backup of the system, and how many tapes will you need?
- When do you do a full backup, and how many tapes will you need?
- Where are tape supplies (labels, write rings) stored?
- Are you responsible for ordering more supplies, and if so, how do you order them?

If You're Operating A New Computer System

If you're the Operator for a new computer system, you'll need to set up and maintain a tape library to safely store backup tapes. You'll also need to choose a backup schedule that is convenient for your users, yet reliably, and regularly, duplicates all important computer information.

To set up your tape library, you need:

- A large number of cartridge or reel tapes to be used only for system backup. The exact number you need depends on how much information is stored in your computer.
- A safe place to keep your backup tapes, like a vault. Usually, the tapes are stored at some location other than where you work.
- A method for keeping track of the information each tape contains.

Where To Get Blank Tapes And Tape Supplies

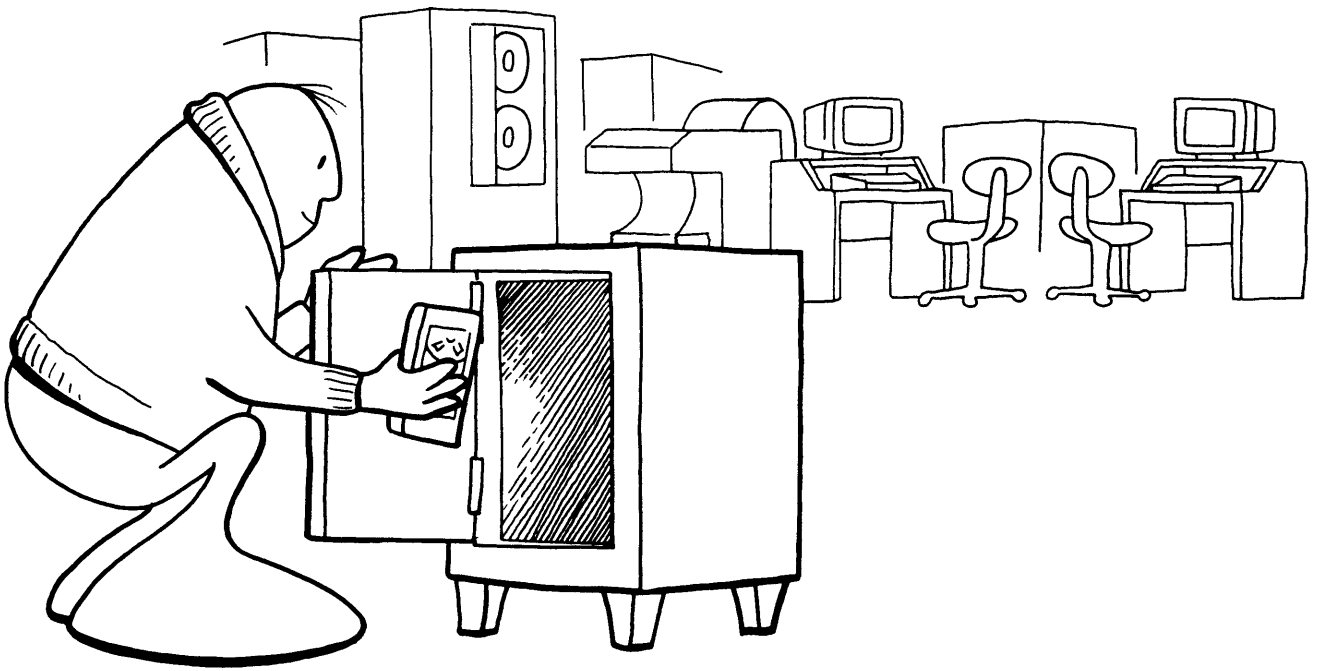
Blank tapes can be ordered from Hewlett-Packard. Your System Manager should have ordering information, and at least an approximate idea of how many tapes to keep on hand.

If you're a staff of one, contact your Hewlett-Packard representative. He or she can tell you what kind of tapes you need and how to order them. Your representative may also suggest other things that will help you set up your tape library. For example, you may want to order a rack to hold the backup tapes.

How To Arrange Safe Storage Of Your Backup Tapes

Since your backup tapes may be the only copy of up-to-date computer information, they are extremely valuable. You can't rely on computer users to make duplicate copies of their important files. Instead, they rely on you to make sure that all the information in the computer, including theirs, is duplicated frequently.

Consult your System Manager about safe storage of the backup tapes, too. You may want to purchase a fire-proof vault, or arrange to store the tapes in another building.



If you're a staff of one, talk to your Hewlett-Packard representative about tape storage, and talk it over with your company's purchasing agent or accounting department. The cost of arranging a storage facility needs to be carefully weighed against the value of your computer's information. Computer equipment can be easily replaced; important files can't.

Keeping Records Of Your Backup Tapes

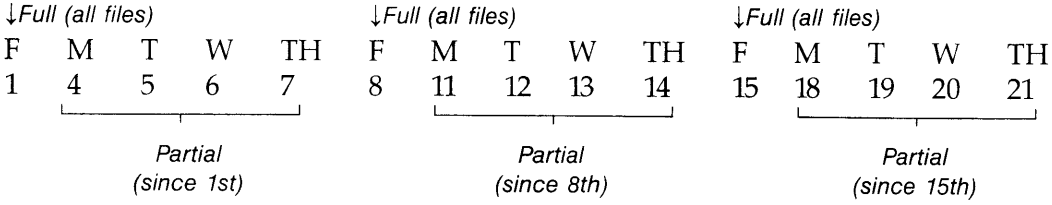
Keeping records of which files you duplicate is fairly straightforward. Each time you create a backup tape, the computer prints a description of the tape's contents. You can keep these reports in a file cabinet, organized by date, or attach them directly to the cartridge or reel with a piece of tape.

A Backup Schedule

There are two ways to back up your system. One, a "full backup", copies everything stored in your computer regardless if any of the information has changed. The second, a "partial backup", copies only those files that have been changed since the last full backup.

A good backup schedule combines both methods. Typically, you'll do a full backup once a week, for example, on Friday, and do a partial backup Monday through Thursday. (If people at your company use the computer over the weekend, you'll probably want to back up the computer Saturdays and Sundays as well.) This way, no more than 24 hours of work will be lost if something goes wrong.

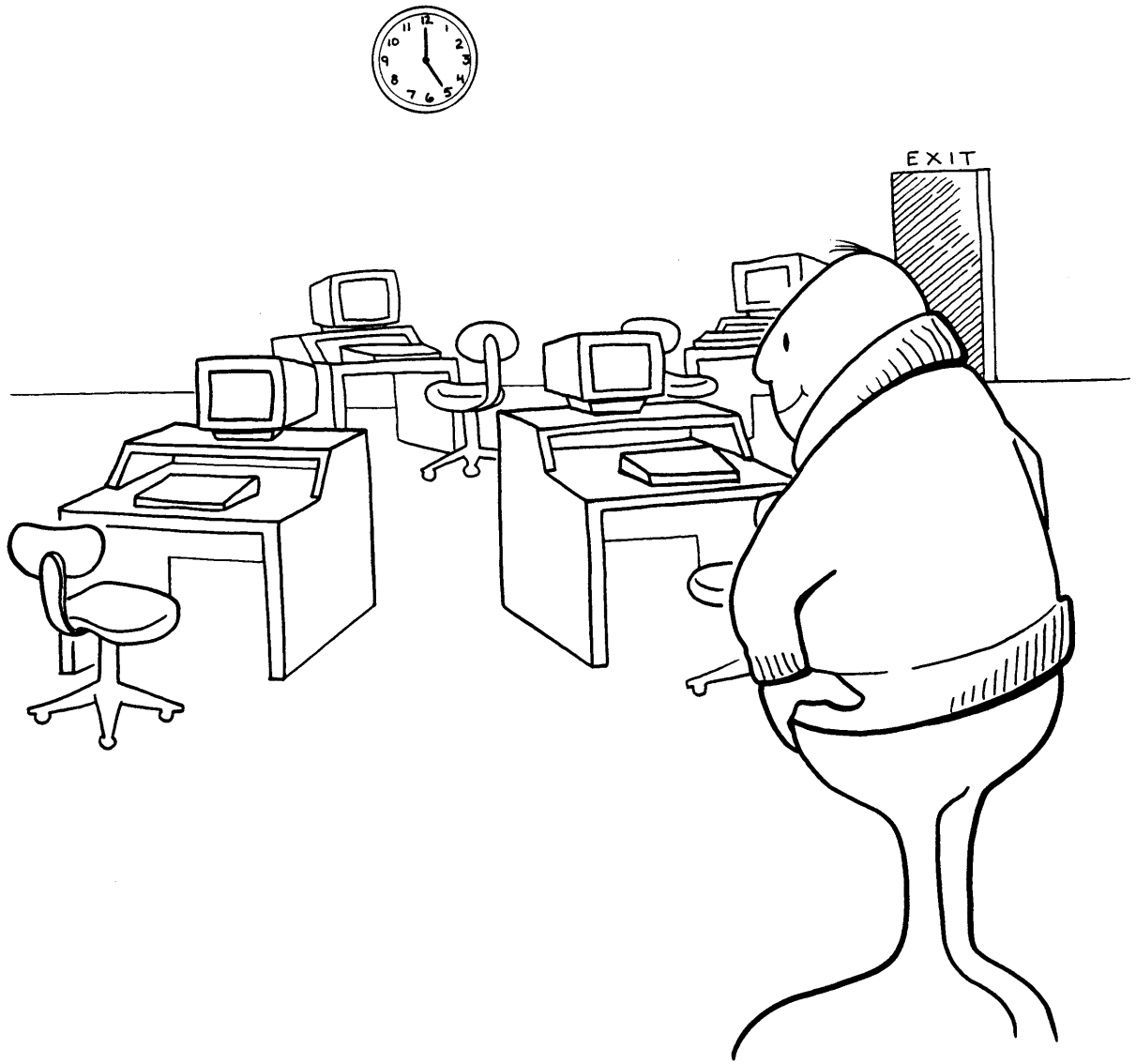
A typical backup schedule looks something like this:



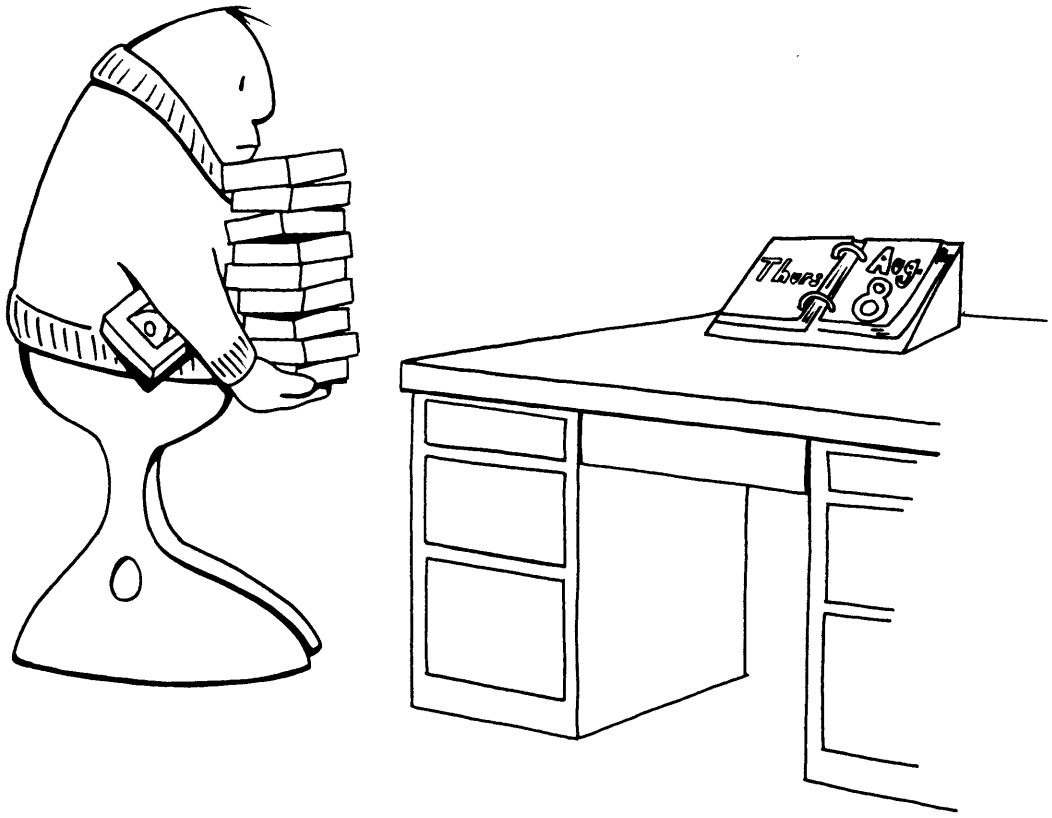
Important Things To Know About A Backup Schedule

There are two important things to consider when you're planning a backup schedule:

- Backups should be done when no one is using the computer. 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.
- Full backups always take more time and more tapes than partial backups. For example, doing a partial backup the day after a full backup requires less time (and fewer tapes) than the partial backup almost a week later. That's because as the week progresses, computer users modify and add more files since the last full backup, so there is more new information to duplicate.


EXIT

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.



Prepare For The Backup

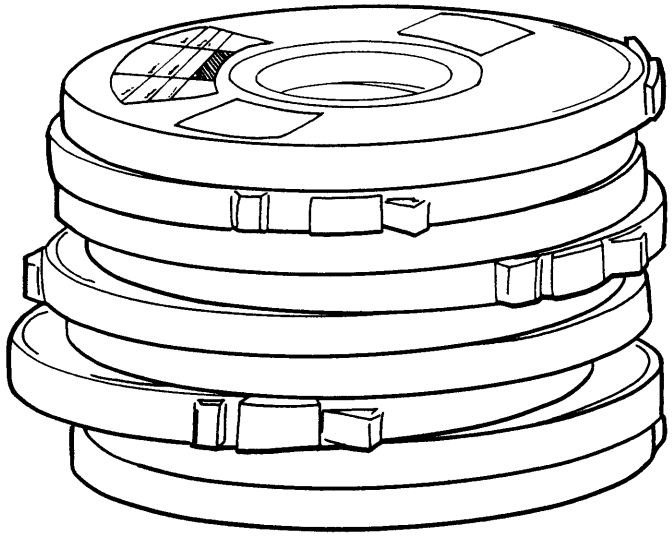
While someone is adding to or changing information in a file, it can't be duplicated. For this reason, everyone should save their files before you begin the backup.

As you may have guessed, 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, prevent people from using the computer.

Step One: Gather The Materials

When you're through with the backup, you will have a set of labelled tapes containing the most current computer information. Therefore, to prepare for the backup, you need the following things:

- Cartridge or reel tapes. The number of tapes you need depends upon whether you're doing a full or partial backup, and how much information your computer stores.
- Write rings for each reel tape you're using. If you're using cartridge tapes, you won't need write rings.
- Tape labels for each cartridge or reel tape you'll use.



Since computer tapes wear out and become unreliable after awhile, it's best to use new tapes. If necessary, you can reuse tapes:

- If they're still in good condition. Check the number written below "CYCLE" on the tape label; it tells you how many times the tape's been used. If the cycle number is higher than recommended by the manufacturer or by your System Manager, don't reuse the tape.
- If they contain only outdated information. The information on a used tape is outdated if the purge date on the label is earlier than today's date.

Step Two: Tell Everyone To Prepare For The Backup

About 15 minutes before you want to start the backup, tell everyone to finish up their work and log off by typing the following message at the Console. (Don't press Return until you've typed the entire message. Otherwise, everyone will get only part of it.)

Type: TELL @S;BACKUP WILL BEGIN IN 15

and: MINUTES. PLEASE FINISH AND LOG OFF.

and: TELL YOUR QUIET NEIGHBORS Return

If you did accidentally type the Return too soon, just start all over again.

Step Three: Prevent New System Activity

Prevent anyone who currently isn't using the computer from doing so.

Type: LIMIT 0,0 Return

and: JOBFENCE 14 Return

To check the new limits and jobfence,

type: SHOWJOB STATUS Return

The last line on your Console should exactly match the one below. If it doesn't, type the commands again.

```
JOBFENCE= 14; JLIMIT= 0; SLIMIT= 0
```

Step Four: Warn Everyone About The Backup

About 5 minutes before you plan to begin the backup, use the WARN command to send everyone a warning. (Remember, don't press Return until you're through typing the entire message.) Regardless what they're doing, they'll get the message.

Type: `WARN @S;BACKUP WILL BEGIN IN TEN`

and: `MINUTES. PLEASE LOG OFF.` Return

To find out who is still using the computer,

type: `SHOWJOB JOB=@S` Return

The computer responds by listing all sessions. Since you've 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's still working; another warning may be necessary.

Step Five: Take Care Of Any Console Requests

Type: `RECALL` Return

If the computer tells you that there are "NO REPLIES PENDING", skip to Step Six. If there are any unanswered Console requests, you'll have to get rid of them by telling the user that the tape drive or printer isn't available. To do so, type "0" instead of the device's LDEV number when you answer the requests:

Hold down CTRL and type: `A`

Type: `REPLY nn,0` Return

↑ *(use the PIN that appears in the request)*

Repeat this process for each request. As you answer them, users will see a "DEVICE UNAVAILABLE" message, and some other information, on their terminal. When you're through, press Return.

Type: **RECALL** Return

If you've gotten rid of all messages, you'll see this:

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

Step Six: Suspend Any Executing Jobs

Type: **SHOWJOB JOB=@J** Return

If the computer responds that there are "NO SUCH JOBS", or if the list contains no executing jobs (check the STATE column for "EXEC"), skip to Step Seven.

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, like this:

Type: **BREAKJOB #Jnnn** Return
↑ *(use a job number from your screen)*

Repeat the BREAKJOB command for each executing job in the list. When you're finished,

type: **SHOWJOB JOB=@J** Return

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'll be reminded to restart any suspended jobs.)

Step Seven: Send Another Warning

Type: SHOWJOB JOB=@S Return

If there are any remaining sessions, besides your own, send them one last warning:

Type: WARN @S;LOG OFF NOW!

and: BACKUP ABOUT TO BEGIN. Return

Step Eight: Abort Any Remaining Sessions

Type: SHOWJOB JOB=@S Return

If, after the last warning, there are still some sessions listed other than your own, you're going to have to abort them. To do so, use the session numbers that appear in the first column on your screen with the ABORTJOB command, like this:

Type: ABORTJOB #Snnn Return
↑ *(use a session number from your screen)*

IMPORTANT

Choose any session number that appears on your Console except your own. You don't want to abort your own session.

When you are finished, type: SHOWJOB Return

You are ready to back up your files when you see only your session and any suspended jobs, like this:

```
JOBNUM  STATE IPRI JIN   JLIST    INTRODUCED  JOB NAME

#S184   EXEC        20   20       FRI  1:03P  OPERATOR.SYS
#J17    SUSP        105  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= 14; JLIMIT= 0; SLIMIT= 0
```

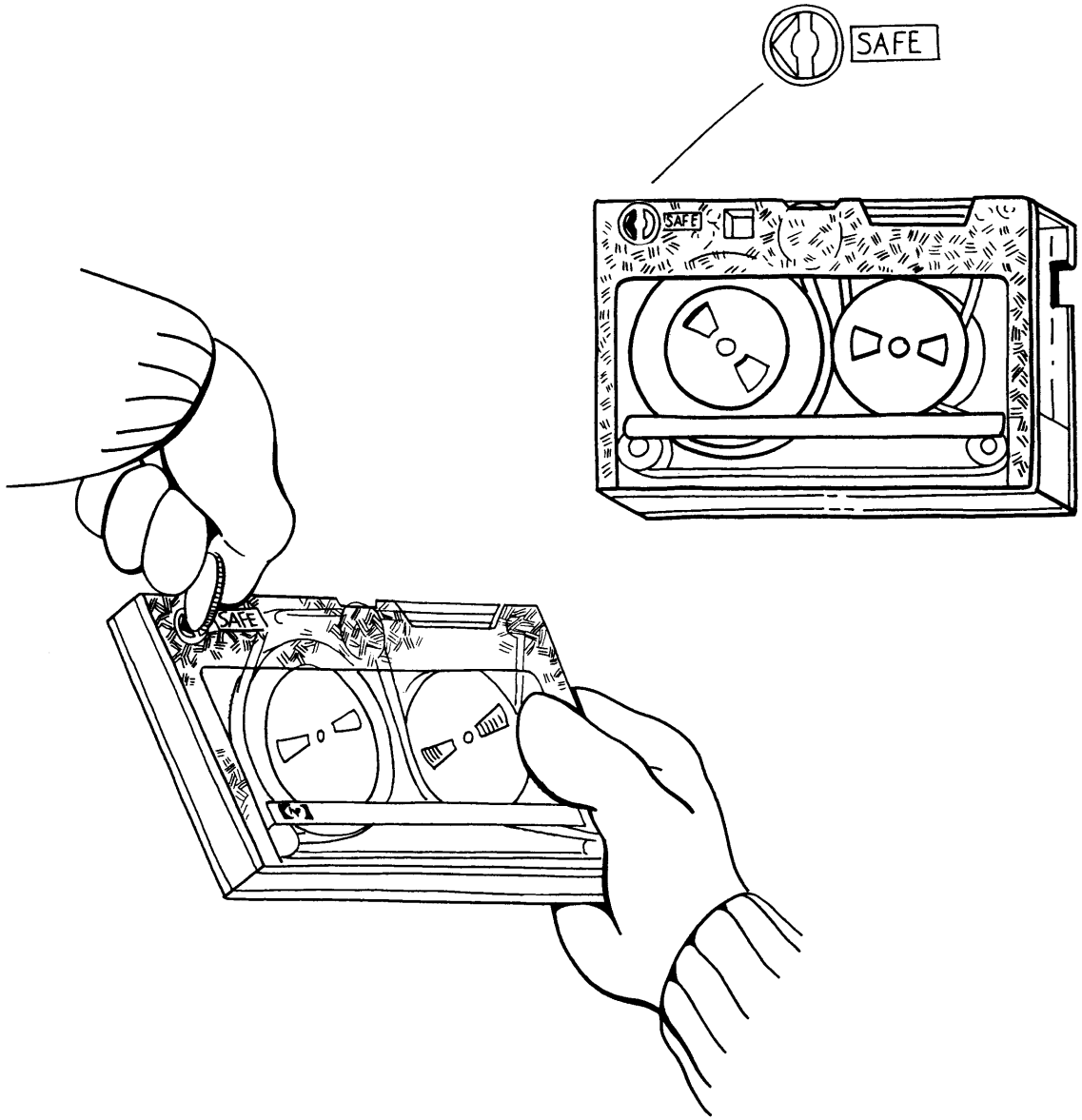
If you are using reel tapes, turn to page 7-28, "Backing Up The Computer With Reel Tapes". If you're using cartridge tapes, keep reading.

Backing Up The Computer With Cartridge Tapes

Now that you've completed the preliminary steps, you are ready to actually begin copying your computer files onto tape. The first three steps describe how to prepare and insert the cartridge tapes into the tape drive; the fifth step tells you how to answer the tape request. If you're comfortable handling tapes by now, skim these sections.

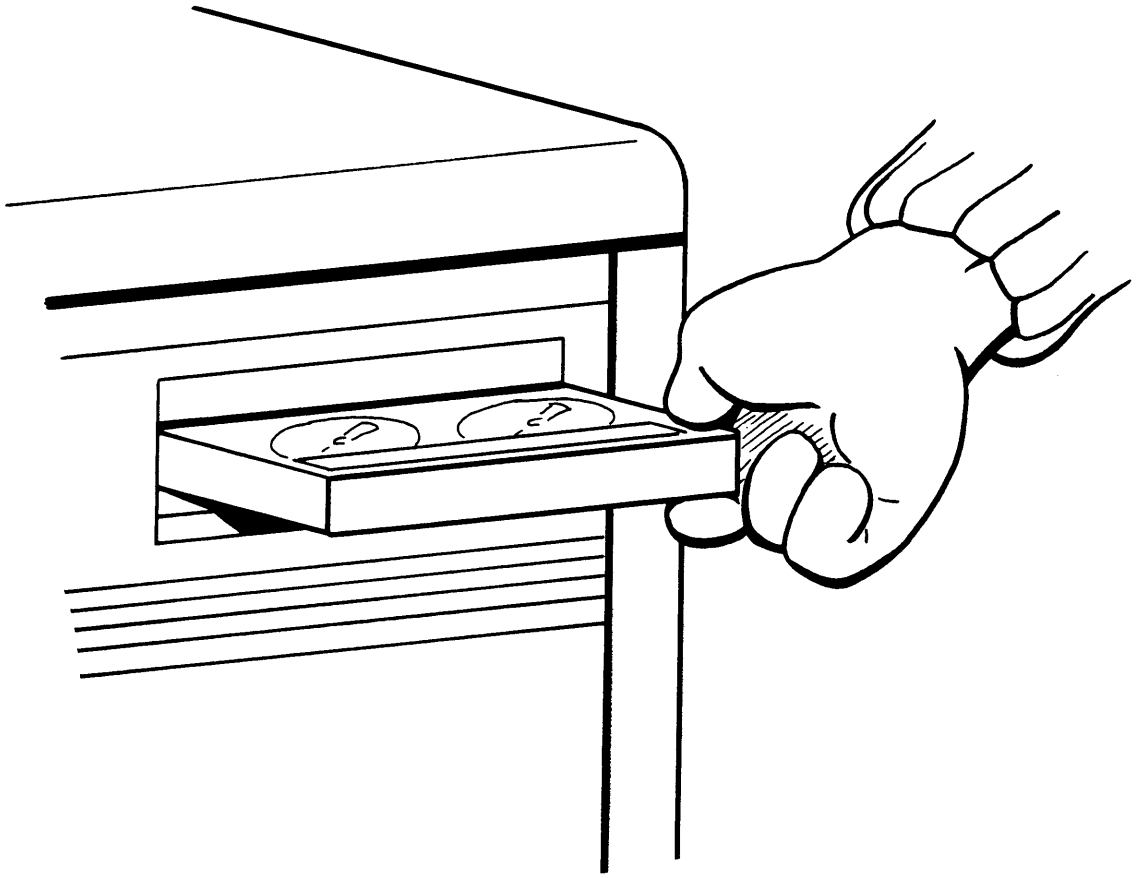
Step One: Prepare The Tape

Engraved on your cartridge tape is the word SAFE. Make sure that the arrow next to this label is pointing away from SAFE:



Step Two: Insert The Tape

Double check that the arrow on the tape is positioned away from SAFE. Now, insert the tape into the cartridge tape drive as shown:



Check the lights on the front of the tape drive. Everything's fine if the BUSY light, and no other, is lit. If the PROTECT light also comes on, read Step Three, below.

The BUSY light may stay on for as much as two minutes; when you're waiting, this seems like a long time. When it goes out, check your Console for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV nn
                (a number; check your screen)↑
```

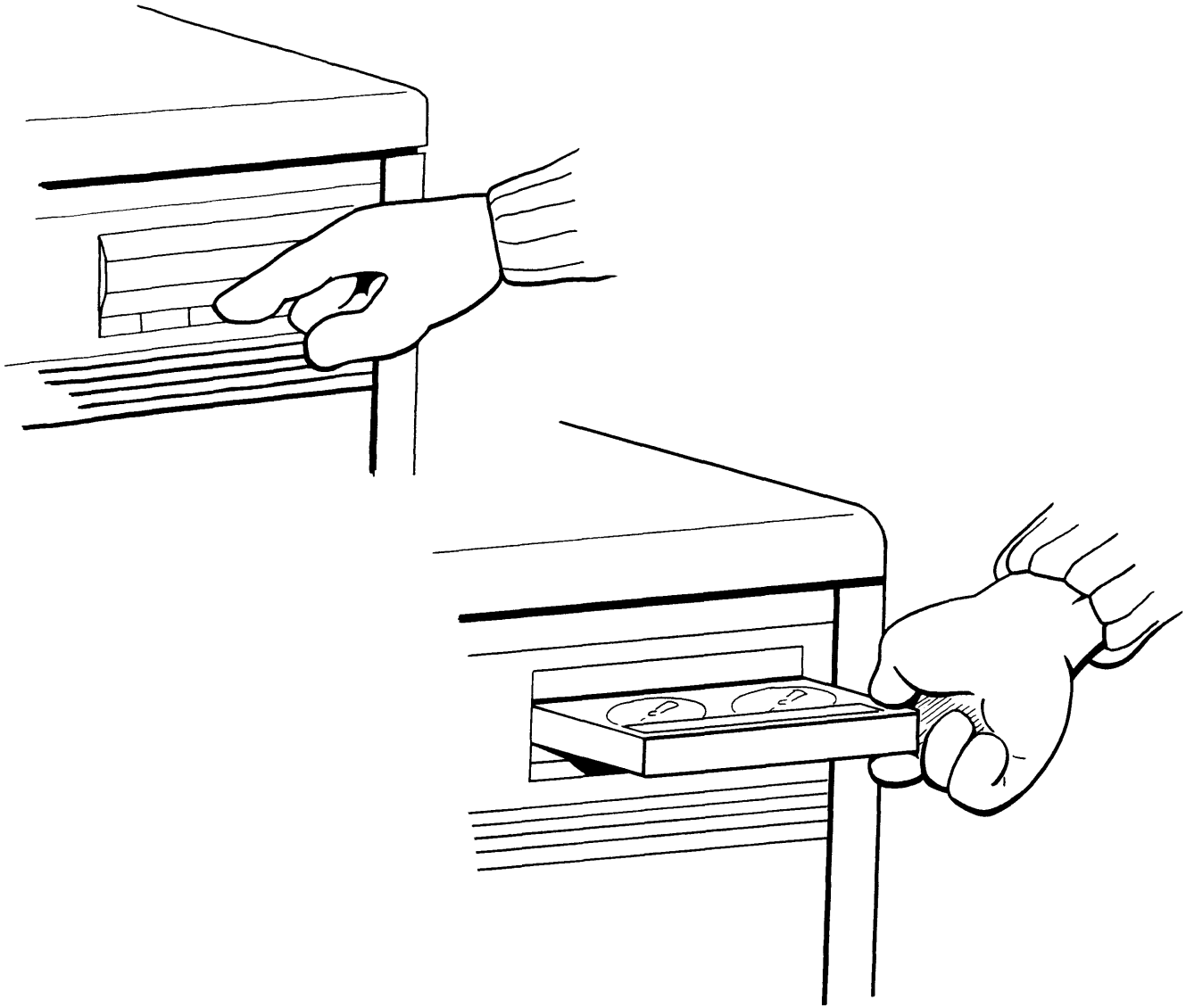
The computer sends you this message to let you know that the tape has been inserted ("MOUNTED") into the tape drive. Remember the number in the message. It's the tape drive's LDEV number, which you'll use to respond to the tape request. Skip to Step Four on page 7-18.

Step Three: If The PROTECT And BUSY Lights Are On

If both the PROTECT and BUSY lights are lit, you have forgotten to turn the arrow on the tape away from SAFE. Since this prevents information from being copied to the tape, you won't be able to back up any files.

To correct this mistake:

- Wait for the BUSY light to go out.
- Press the UNLOAD button on the tape drive. (The BUSY light will come on again.)
- Wait for the BUSY light to go out, which again may take up to two minutes. Then, eject the tape by pressing the button located directly below the tape compartment.
- Remove the tape.
- Turn the arrow on the tape away from SAFE.
- Go back to Step One, "Prepare The Tape" on page 7-14, and try again.



Step Four: Command The Computer To Begin The Backup

If you're copying only those files that have been recently changed or added (a partial backup),

type: FILE SYSDLIST;DEV=LP Return

and: PARTBACKUP Return

If you're copying all computer files (a full backup),

type: FILE SYSDLIST;DEV=LP Return

and: FULLBACKUP Return

If you mistype anything, the computer responds with an error message. They're easy to recognize: error messages include either "S/R", 'CIERR", or "FSERR" followed by a number. If you see one, just type the commands again.

IMPORTANT

Did the computer tell you that FULLBACKUP and PARTBACKUP are unknown commands? If so, check the version number of your operating system (recorded on page 1-2). If it begins with something other than "G.01", you must type a different sequence of commands to begin the backup procedure, and you must have OP capability to use these commands. Follow the instructions for "Using The SYSDUMP Command To Back Up Your System" on page 7-44, then continue with Step Five, on page 7-20.

When you type the information correctly, you will see one of two things:

- The BUSY light on the tape drive will come on. This means that your computer automatically answered the tape request, and the backup procedure has begun. Skip to Step Six, "Follow Your Progress", on page 7-21.
- A tape request, like the one below, appears on the Console. To answer it, continue with the next step.

```
?14:57/#S25/43/LDEV# FOR "DUMPTAPE" ON CTAPE (NUM),WRITE RING?
(Y/N)
```

IMPORTANT

If other people, besides you, are still using the computer, you'll also see a warning on the Console, like this:

```
WARNING:  A  SYSTEM BACKUP IS OCCURING WITH MORE THAN
ONE USER LOGGED ON.
```

The warning doesn't prevent you from beginning the backup procedure. It just lets you know that someone might still be updating their files, which prevents the computer from duplicating the latest changes. You may either continue with the backup, send another warning, or go talk to the user in person.

Step Five: Respond To The Tape Request

To answer a tape request, you must know:

- The LDEV number of your tape drive. This number appeared in the "VOLUME MOUNTED" message that was printed on the Console when you inserted the tape.
- The process identification number, or PIN, which is part of the tape request.

```
?14:57/#S25/43/LDEV# FOR "DUMPTAPE" ON CTAPE (NUM),WRITE RING?
(Y/N)          ↑ (the PIN; yours will be different)
```

If the request rolled up off the screen to make room for other Console messages, ask the computer to show it to you again. The computer will display your tape request, along with any others that are still pending.

Hold down CTRL and type: A

At the "=" prompt, type: RECALL Return

Use the PIN in your message and the LDEV number of your tape drive to answer the tape request.

Hold down CTRL and type: A

At the "=" prompt, type: REPLY nn,n,Y Return

(use your PIN) ↑ ↑ *(use your LDEV number)*

The BUSY light on the tape drive will come on, which tells you the backup has begun.

Step Six: Follow Your Progress

During the first ten minutes of the backup, nothing appears on the Console. It's an ideal time to get yourself a cup of coffee or catch up on some other work.

Next, you'll see the first of several progress messages:

```
STORE OPERATION IS 4% COMPLETE
```

A similar message will appear every minute or so:

```
STORE OPERATION IS 4% COMPLETE
STORE OPERATION IS 7% COMPLETE
STORE OPERATION IS 11% COMPLETE
STORE OPERATION IS 15% COMPLETE
              .
              .
              .
              (and so on)
```

These messages will continue to appear until you see one of two things:

- A message indicating that the tape is full, followed quickly by an "LDEV NOT READY" message (which appears when the tape rewinds and is ready to be removed):

```
15:28/#S415/59/MOUNT NEXT STORE REEL (#2) ON LDEV #nn (S/R 9024)

15:29/#S415/59/LDEV #nn NOT READY
                        ↑ (your tape drive's LDEV number)
```

IMPORTANT

The first message, above, was clearly written for reel-to-reel tape users. Don't worry: for you, it translates to "insert the next tape cartridge", since no more files can be stored on the tape.

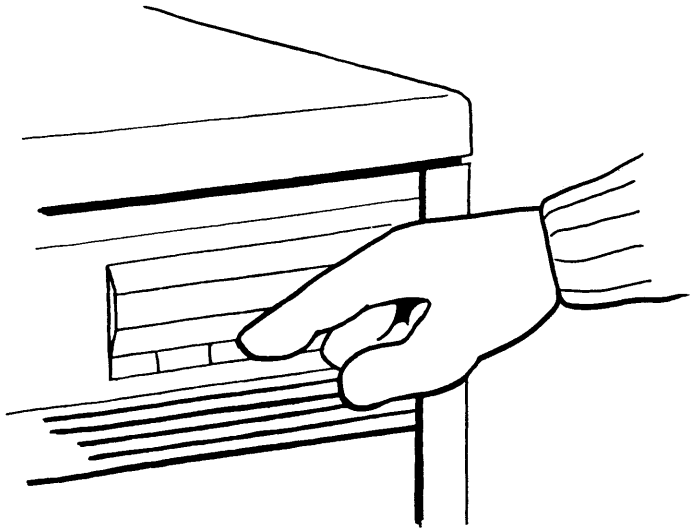
- The following message, which indicates that the backup is finished, and the tape can be removed.

```
END OF SUBSYSTEM
:

15:29/#S415/59/LDEV #nn NOT READY
                        ↑ (your tape drive's LDEV number)
```

Regardless which message you see, continue with the next three steps to remove, secure, and label the tape.

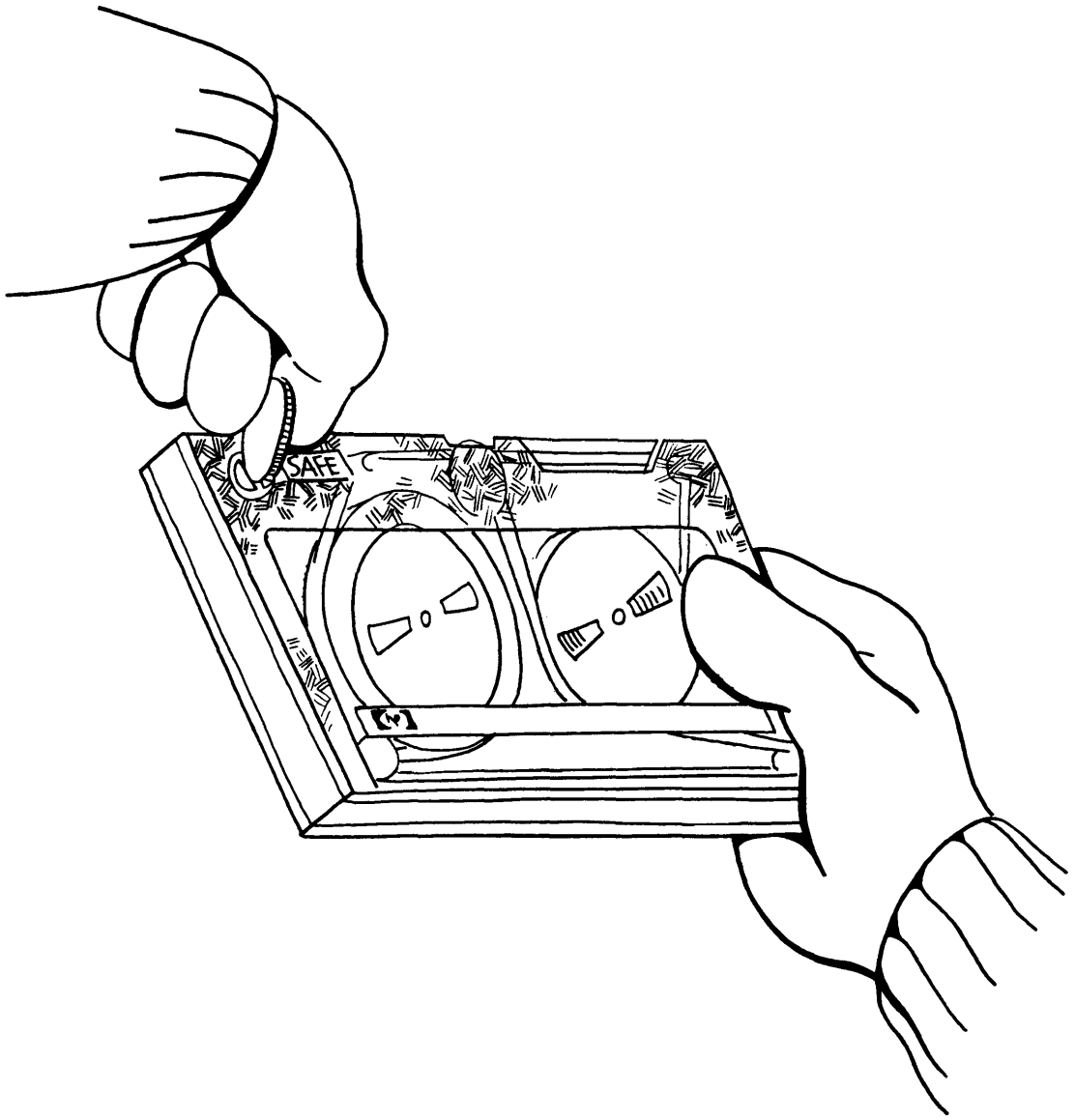
Step Seven: Remove The Tape

Check the BUSY light on the front of the tape drive. It stays on while the tape is rewinding, which could take up to two minutes. When the BUSY light goes out, press the button directly below the tape compartment to eject the tape. Remove the tape.



Step Eight: Secure The File

Turn the arrow on the tape so that it points toward SAFE. As long as the arrow is in this position, the files cannot be removed from the tape and no other files can be copied onto it.



Step Nine: Label The Tape

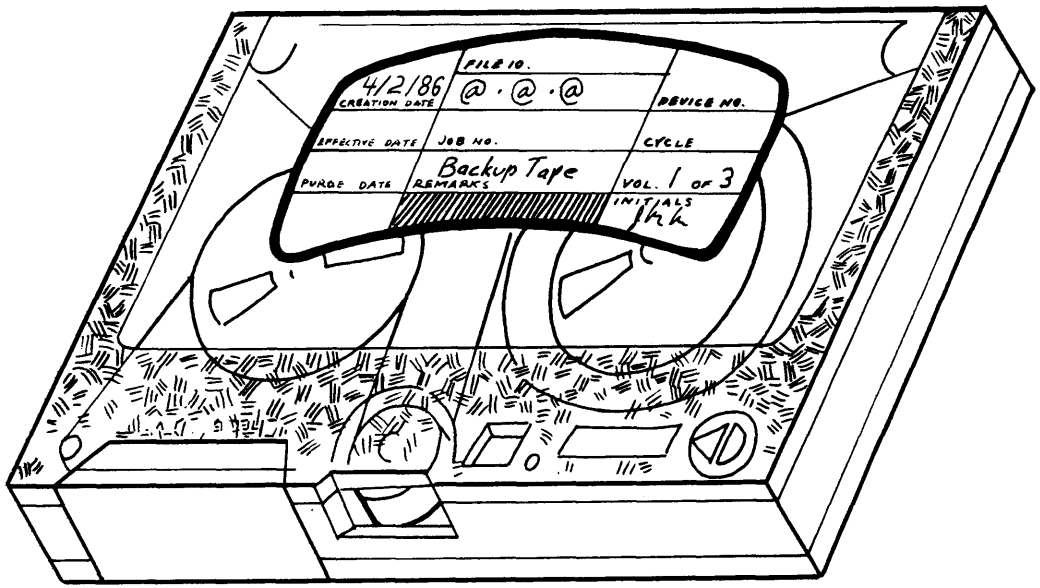
To ensure that everyone knows the tape contains important information, place a label on the tape directly above "CERTIFIED DATA CARTRIDGE". Write the following information on the label:

- Today's date, under "CREATION DATE".
- The number of times the tape has been used, under "CYCLE". For example, if you selected a new tape, write "1" under CYCLE, since this is the first time it's been used. If the tape's been used before, add 1 to the current cycle number to indicate that you've just used it again.
- Any remarks about the tape, under "REMARKS". Depending on which backup command you used to create the tape, indicate whether it's a partial backup tape or a full backup tape.
- The number of tapes required to complete the backup, under "VOL n OF n". For example, if you used a total of three tapes, label them "VOL 1 OF 3", "VOL 2 OF 3", and "VOL 3 OF 3" in the order that they were used. If you're not sure yet how many you'll use, just write down whether it's the first, second, or third tape, and complete the rest of the label when you're through with the backup.
- Your name or initials, under "INITIALS".
- The name given to your computer, under "SYSTEM NAME". (Names are frequently used to distinguish one system from another. If your company uses only one computer system, it may not have a formal name; the invectives you use when the computer's not doing what you want don't count!) This way, you'll know which computer the files belong to in case you need to transfer them back.

IMPORTANT

Files copied to tape during a system backup can be transferred back to the computer with the RESTORE command. For information about restoring files, refer to Chapter Six.

Here is an example of a correctly labelled backup tape:



Step Ten: If The Backup Isn't Complete

If you're not through copying all the files, get another cartridge tape. To continue, repeat the steps you just performed, with two exceptions: don't retype the commands (Step Four), and don't wait for a tape request (Step Five). None will appear since the backup is already in progress.

The steps you'll follow to continue with the backup are:

- Prepare the tape by turning the arrow away from SAFE.
- Insert the tape into the drive.
- When the BUSY light goes off, look for this message on the Console:

```
15:32/7/SERIAL DISC ON LDEV #nn
       (your tape drive's LDEV number) ↑
```

- Watch the Console for the progress messages; they'll begin appearing again, at one minute intervals.
- Several minutes later, one of two messages appear:

  If you're told to "MOUNT NEXT STORE REEL", then remove the tape, secure, and label it. Choose another tape and begin again.

  If you see the message below, the backup is complete:

```
END OF SUBSYSTEM
:_

15:45/19/VOLUME DISMOUNTED ON LDEV #nn
              (your tape drive's LDEV number) ↑
```

Remove the tape, secure, and label it. Continue with Step Eleven, next.

Step Eleven: Get Your Printed Report

The description of the files that were copied to the tape is produced in a report. Get the report from your printer and either keep it in a folder or a file drawer for your records. Or, attach it directly to the cartridge with tape.

Put the tape in your tape library, vault, or wherever you're keeping backup tapes. You'll only need to use it if the copy of the files on disc are lost or destroyed. In this case, you can use the RESTORE command to transfer the file(s) from the tape back to the computer's disc. For information about restoring files, refer to Chapter Six.

The next few pages describe how to backup your files using reel tapes. If your computer doesn't have a reel-to-reel tape drive, skip it and go on to "After You've Completed The Backup" on page 7-46.

Backing Up The Computer With Reel Tapes

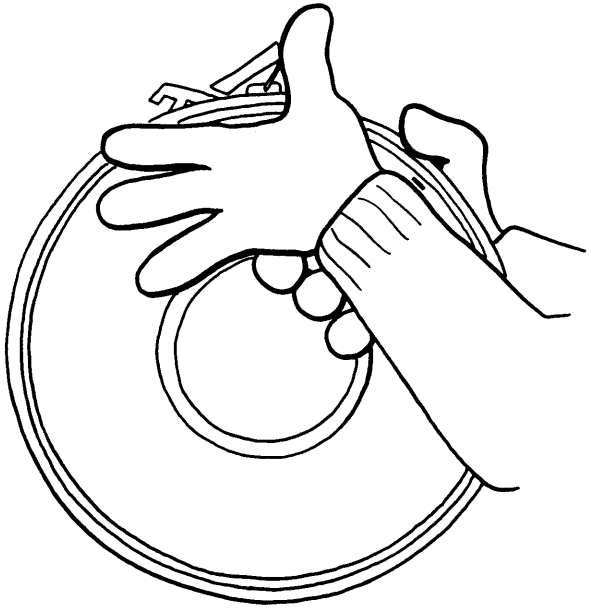
Now that you've completed the preliminary steps, you are ready to actually begin copying your computer files onto tape. The first three steps describe how to prepare and mount reel tapes onto the tape drive; the fifth step tells you how to answer the tape request. If you're comfortable handling tapes by now, skim these sections.

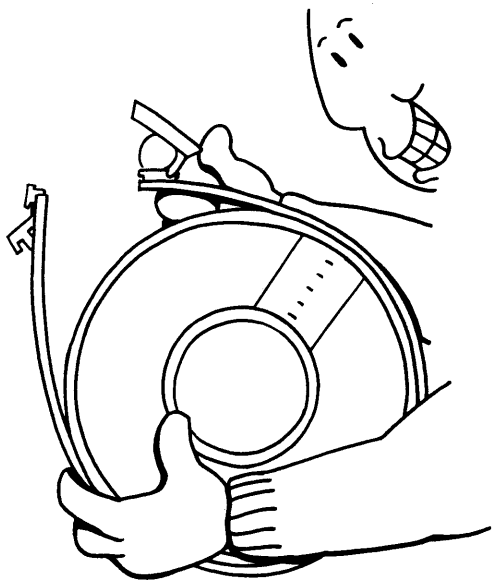
IMPORTANT

If you've just finished reading about cartridge tapes, most of the information in this section will be familiar. Skim through what you know, but pay particular attention to tape handling instructions (Steps One through Three, beginning on this page) and the commands typed at the Console (Step Four, on page 7-34).

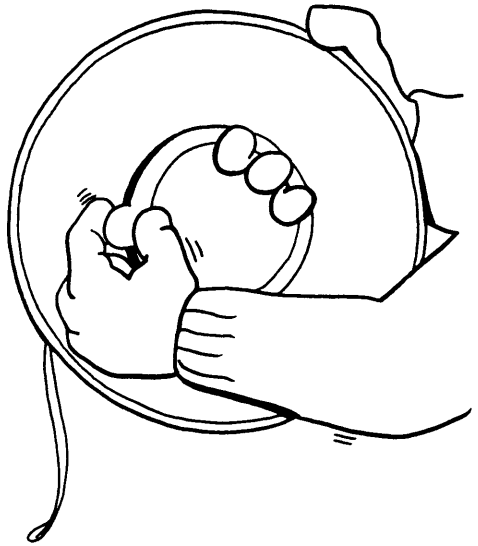
Step One: Prepare The Tape

Reel tapes are protected by a plastic band that wraps around the reel. Unlatch the band and remove it.



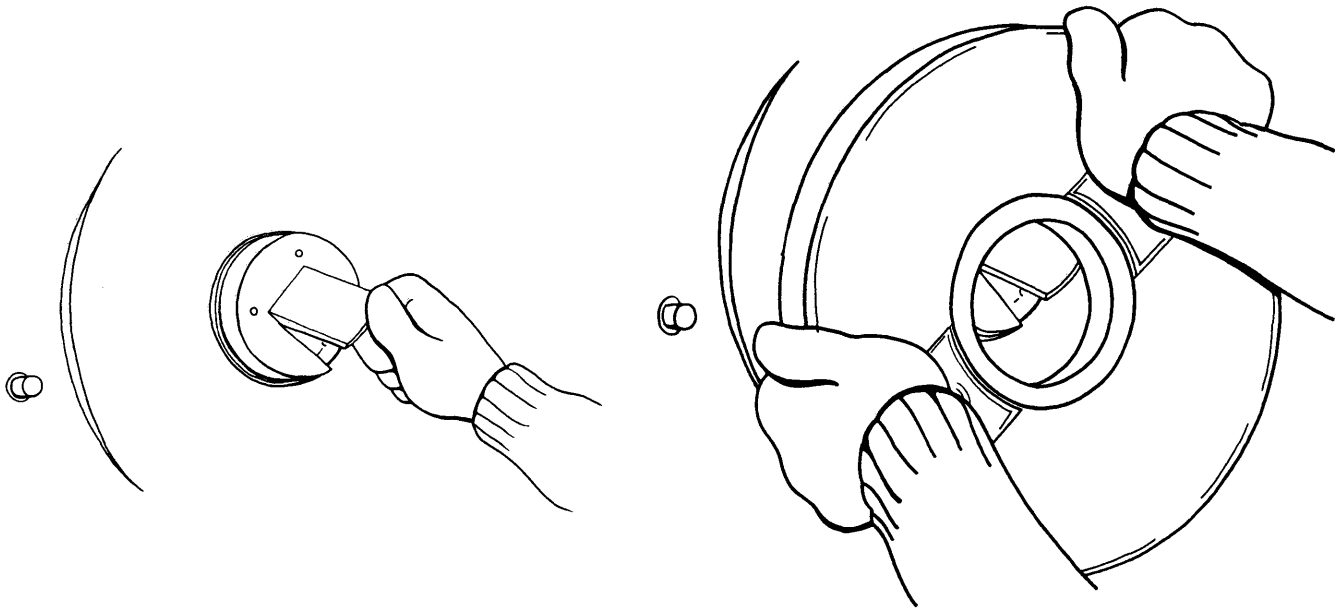


Find the circular groove on the back of the tape reel. Insert a plastic "write ring" into the groove, if it doesn't already have one.



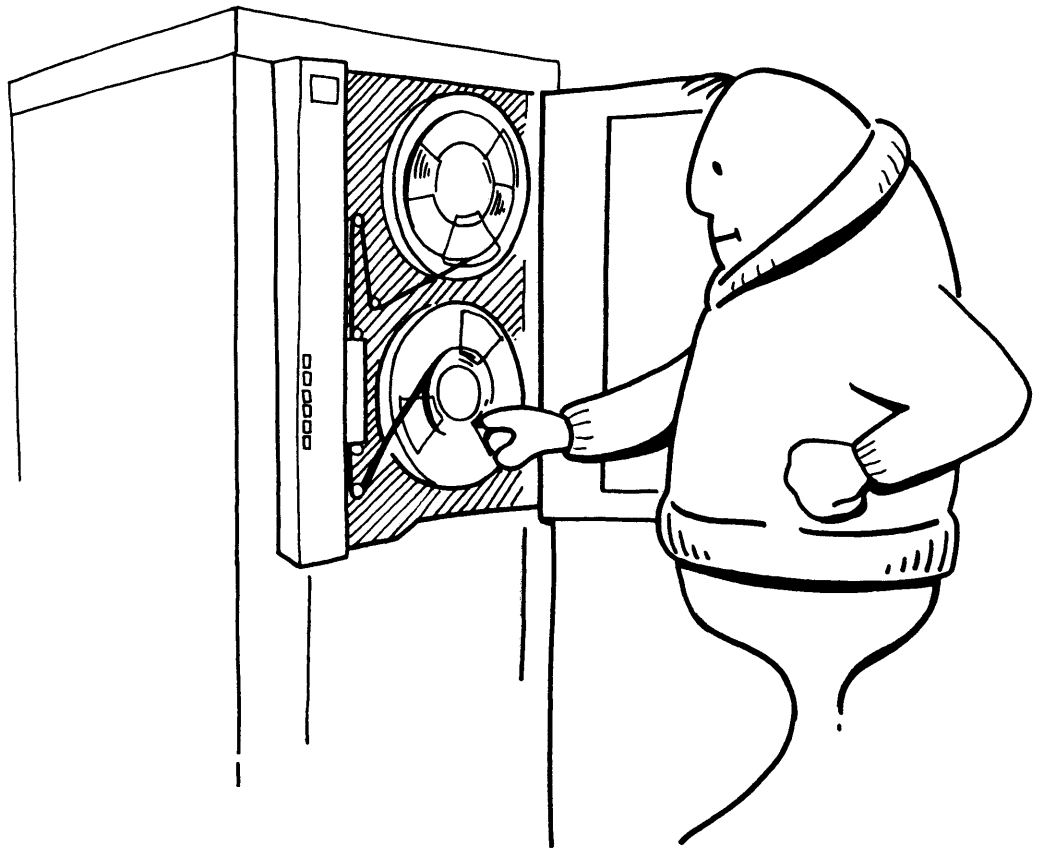
Step Two: Mount The Tape And Prepare The Tape Drive

Open the door of your tape drive. You'll see two spools, one without a reel, and one containing an empty, permanently fixed reel. If the spool without a reel has a latch, flip the latch up. Fit the tape reel onto this spool so that the side with the write ring is placed against the tape drive. The reel will fit snugly onto the spool. Flip the latch down to lock the reel in place.

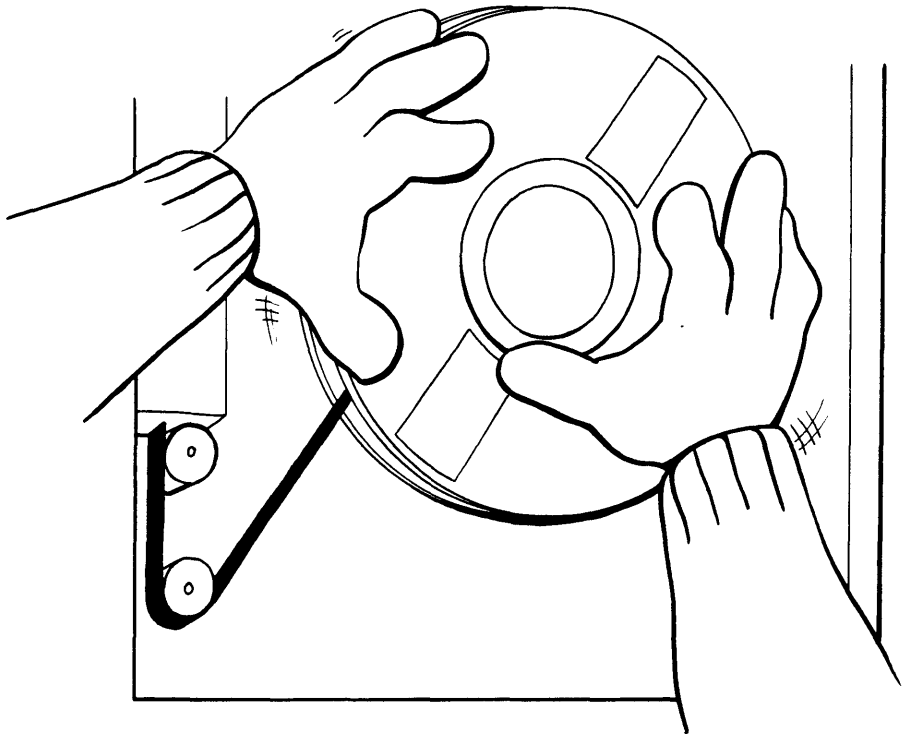


Next, unwind about four feet of tape from the reel. (This makes it easier to thread the tape, and you won't hurt anything. The first several feet of tape is "leader", and contains no information.)

Thread the tape around the pulleys using the diagram on the tape drive as a guide. If you've never threaded the tape before, it will be very awkward. Don't worry: just take your time and make sure the tape follows the path exactly as shown on the tape drive. When the tape is threaded, pull the free end up and over the top of the empty reel in a clockwise direction. Don't worry if the tape is a little bit loose.



Hold the end of the tape in place on the empty reel, and turn the reel clockwise. Rotate the reel a few times so that the free end won't come off the reel. Check the tension on the tape. If turning one spool by hand also turns the other spool, the tape is mounted securely.



Shut the door of your tape drive. Next, press the LOAD button, then the ONLINE button on the tape drive. The tape will begin to spin.

When the tape stops, go back to the Console and check for this message:

```
VOLUME (Unlabelled) MOUNTED ON LDEV# nn
                    (a number; check your screen) ↑
```

Remember the number in the message. It's the LDEV number of your tape drive, which you'll use to respond to the tape request in Step Five.

Step Three: Command The Computer To Begin The Backup

If you're copying only those files that have been recently changed or added (a partial backup),

type: FILE SYSDLIST;DEV=LP Return

and: PARTBACKUP Return

If you're copying all computer files (a full backup),

type: FILE SYSDLIST;DEV=LP Return

and: FULLBACKUP Return

If you mistype anything, the computer responds with an error message. They're easy to recognize: error messages include either "S/R", 'CIERR", or "FSERR" followed by a number. If you see one, just type the commands again.

IMPORTANT

Did the computer tell you that FULLBACKUP and PARTBACKUP are unknown commands? If so, check the version number of your operating system (recorded on page 1-2). If it begins with something other than "G.01", you must type a different sequence of commands to begin the backup procedure, and you must have OP capability to use these commands. Follow the instructions for "Using The SYSDUMP Command To Back Up Your System" on page 7-44, then continue with Step Five, on page 7-35.

When you type the information correctly, you will see one of three things:

- The tape begins moving. This means that your computer automatically answered the tape request, and the backup procedure has begun. Skip to Step Six, page 7-36, to follow your progress.
- A tape request, like the one below, appears on the Console. To answer it, skip to Step Five, page 7-35.

```
?14:57/#S25/43/LDEV# FOR "DUMPTAPE" ON TAPE (NUM),WRITE RING?
(Y/N)
```

- The computer tells you that there's "NO WRITE RING" in the tape reel, which means you can't copy any files to the tape. If you see this message, read Step Four, on the next page.

IMPORTANT

If other people, besides you, are still using the computer, you'll also see a warning on the Console, like this:

```
WARNING:  A  SYSTEM BACKUP IS OCCURRING WITH MORE THAN
ONE USER LOGGED ON.
```

The warning doesn't prevent you from beginning the backup procedure. It just lets you know that someone might still be updating their files. Until the files are saved, with the latest changes, the computer can't copy them to tape. In this case, you may either continue with the backup, send another warning, or talk to the user in person.

Step Four: What To Do If You See "NO WRITE RING"

If you forgot to insert a write ring into the tape reel earlier, you'll see a message like this:

```
14:57/2/LDEV#nn NO WRITE RING
              ↑ (a number; check your screen)
```

To correct this mistake:

- Press the REWIND button on the tape drive.
- When the tape stops spinning, open the door and flip the spool latch up to remove your tape reel. (If there is no latch, just remove your tape.)
- Insert a write ring into the circular groove on the back of the reel.
- Go back to Step Two, page 7-30, to mount the tape and prepare the tape drive.

Step Five: Respond To The Tape Request

To answer a tape request, you must know:

- The LDEV Number of your tape drive. This number appeared in the "VOLUME MOUNTED" message that was printed on the Console when you prepared the tape drive.
- The process identification number, or PIN, which is part of the tape request.

```
?14:57/#S25/43/LDEV# FOR "DUMPTAPE" ON TAPE (NUM),WRITE RING(Y/N)?
              ↑ (the PIN; yours will be different)
```

If the request rolled up off the screen to make room for other Console messages, ask the computer to show it to you again. The computer will display your tape request, along with any others that are still "pending".

Hold down CTRL and type: A

At the "=" prompt, type: RECALL Return

Use the PIN in your message and the LDEV number of your tape drive to answer the tape request.

Hold down CTRL and type: A

At the "=" prompt, type: **REPLY nn,n,Y** Return

(use your PIN) ↑ ↑ *(use your LDEV number)*

When the computer begins copying the files onto the tape, the tape will move.

Step Six: Follow Your Progress

During the first ten minutes of the backup, nothing is displayed on the Console. Then, the first of several progress messages from the computer appears, like this:

```
STORE OPERATION IS 4% COMPLETE
```

A similar message will appear every minute or so:

```
STORE OPERATION IS 4% COMPLETE
STORE OPERATION IS 7% COMPLETE
STORE OPERATION IS 11% COMPLETE
                   .
                   .
                   .
              (and so on)
```

These messages will continue to appear until you see one of two things:

- A message indicating that the tape is full:

```
15:28/#S415/59/MOUNT NEXT STORE REEL (#2) ON LDEV #nn (S/R 9024)
```

- The following message, which indicates that the backup is finished and the tape can be removed.

```
END OF SUBSYSTEM
:_
```

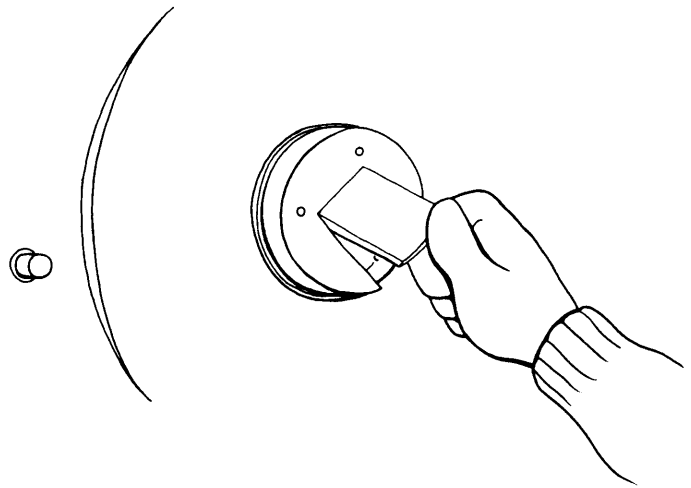
Regardless which message you see, continue with the next three steps to remove, secure, and label the tape.

Step Seven: Remove The Tape

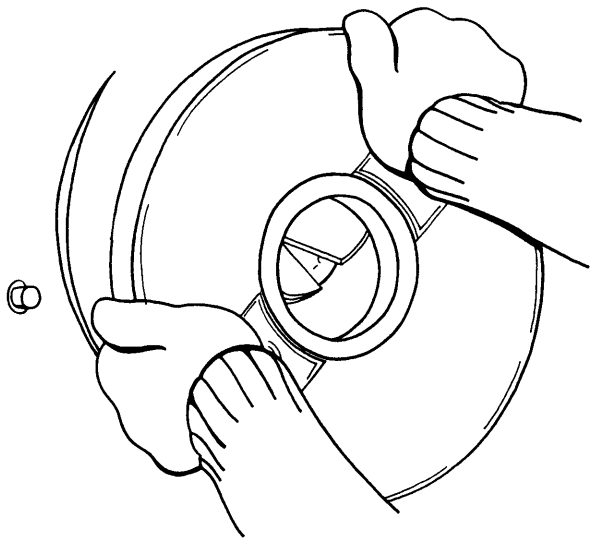
When the tape is full, or the backup is finished, press the REWIND button on the tape drive. The tape will rewind itself off the fixed reel, and a message like this will appear on the Console:

```
15:29/#S415/59/LDEV #nn NOT READY
                    ↑ (your tape drive's LDEV number)
```

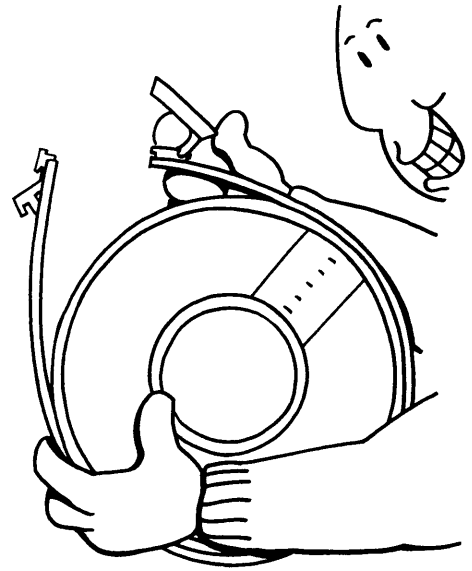
Open the door of the tape drive and flip the latch up (if there is one) to remove your tape.



Take the tape reel off the spool:



Wrap the tape band around the reel to protect the tape.



Step Eight: Secure The File

Remove the write ring from the back of the reel. This prevents anyone from copying other files onto the tape and destroying the information on it.

Step Nine: Label The Tape

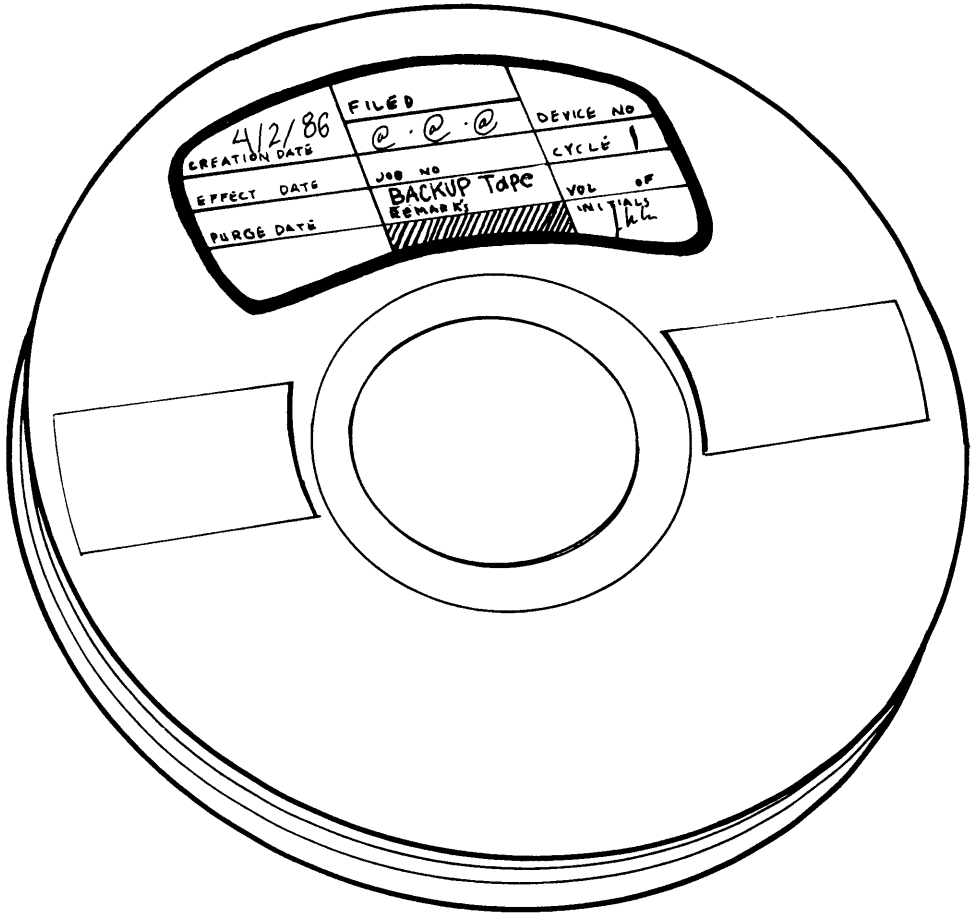
To ensure that everyone knows the tape contains important information, place a label on the tape and record the following information on it.

- Today's date, under "CREATION DATE".
- The number of times the tape has been used, under "CYCLE". For example, if you selected a new tape, write "1" under CYCLE, since this is the first time it's been used. If the tape's been used before, add 1 to the current cycle number to indicate that you've just used it again.
- Any remarks about the tape, under "REMARKS". Depending on which backup command you used to create the tape, indicate whether it's a partial backup tape or a full backup tape.
- The number of tapes required to complete the backup, under "VOL n OF n". For example, if you used a total of three tapes, label them "VOL 1 OF 3", "VOL 2 OF 3", and "VOL 3 OF 3" in the order that they were used. If you're not sure yet how many you'll use, just write down whether it's the first, second, or third tape, and complete the rest of the label when you're through with the backup.
- Your name or initials, under "INITIALS".
- The name given to your computer, under "SYSTEM NAME". (Names are frequently used to distinguish one system from another. If your company uses only one computer system, it may not have a formal name; the invectives you use when the computer's not doing what you want don't count!) This way, you'll know which computer the files belong to in case you need to transfer them back.

IMPORTANT

Files copied to tape during a system backup can be transferred back to the computer with the RESTORE command. For information about restoring files, refer to Chapter Six.

Here is an example of a correctly labelled backup tape:



Step Ten: If The Backup Isn't Complete

If the backup isn't complete, get another reel tape. To continue, repeat the steps you just performed with two exceptions: don't retype the commands (Step Three) and don't wait for a tape request (Step Five); none will appear since the backup is already in progress. The steps you'll follow to continue with the backup are summarized on the next page:

- Prepare the tape by unwrapping the tape band from the reel and inserting a write ring into it.
- Mount the tape on the drive and put the tape drive online.
- Watch the Console for the progress messages; they'll begin appearing again, at one minute intervals.
- Several minutes later, one of two messages appear:

  If you're told to "MOUNT NEXT STORE REEL", press the REWIND button to rewind the tape, then:

  - Take the tape off the spool.
  - Remove the write ring.
  - Place the tape band on the reel.
  - Label the tape.
  - Choose another tape and begin again.

  The other message you might see tells you that the backup is complete:

```
END OF SUBSYSTEM
:_
```

If you see the message above, press the REWIND button. When the tape winds off the fixed reel, check the Console for this message:

```
15:45/19/VOLUME DISMOUNTED ON LDEV #nn
                (your tape drive's LDEV number) ↑
```

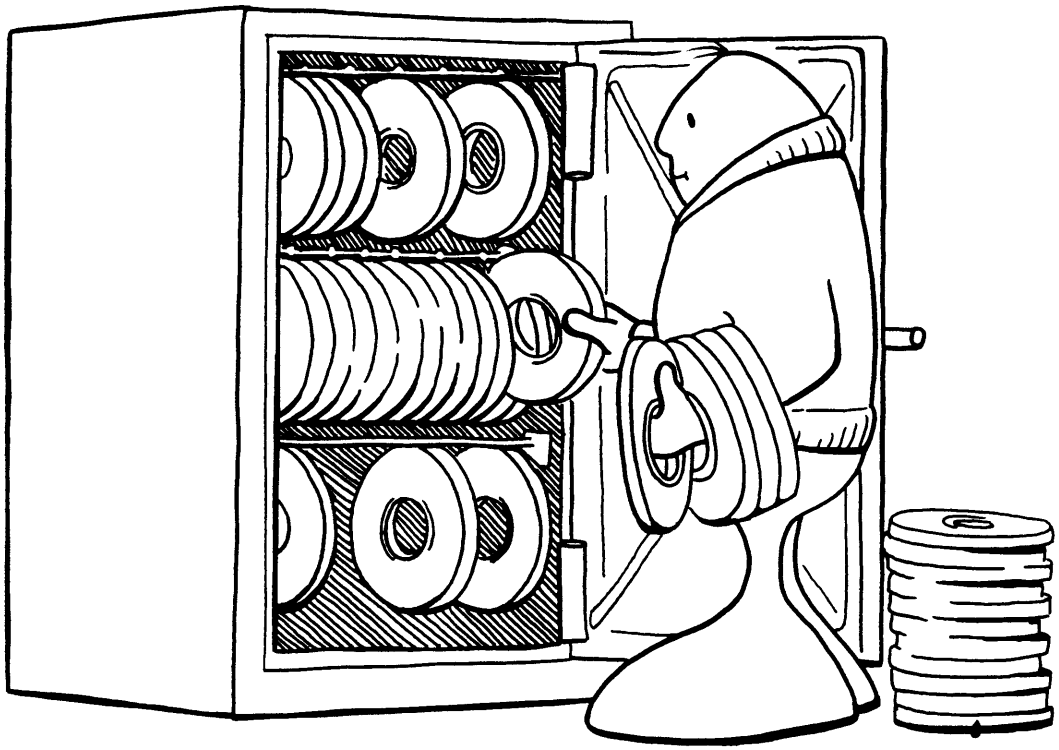
Then:

- Take the tape off the spool.
- Remove the write ring.
- Place the tape band on the reel.
- Label the tape.

Step Eleven: Get Your Printed Report

The description of the files that were copied to the tape is produced in a report. Get the report from your printer and either keep it in a folder or a file drawer for your records. Or, attach it directly to the reel with a piece of tape.

Put the tape in your tape library, vault, or wherever you're keeping backup tapes. You'll only need to use it if the copy of the files on disc are lost or destroyed.



Using The SYSDUMP Command To Back Up Your System

Some versions of the MPE operating system don't include the FULLBACKUP and PARTBACKUP commands. In this case, your alternative is to use the SYSDUMP command. To use SYSDUMP, however, you must be assigned OP capability. If you're not sure, check the list of capabilities assigned to OPERATOR.SYS on page 1-2. If you didn't record your capabilities yet, read "What Capabilities Is OPERATOR.SYS Assigned?" in Chapter One.

Cartridge Tape Backup

Select, prepare, and insert a cartridge tape into your drive. When the BUSY light goes out, and you're ready to type the commands,

type: FILE T;DEV=CTAPE Return

and: FILE L;DEV=LP Return

and: SYSDUMP *T,*L Return

To answer the question "ANY CHANGES?", press Return

When you see "ENTER DUMPDATE", do one of two things:

- For a full backup, type: 0 Return
- For a partial backup, type the date (mm/dd/yy) of the most recent full backup, followed by a carriage return. For example, "November 7, 1985" would be represented "11/07/85".

To respond to "ENTER DUMPFILE SUBSETS", type: @.@.@ Return

To respond to "LIST FILES DUMPED", type: Y Return

Continue with Step Five, page 7-20, to respond to the tape request.

Reel Tape Backup

Select, prepare, and mount a reel tape onto your tape drive. Press the LOAD and ONLINE buttons. When the tape is ready,

type: FILE T;DEV=TAPE Return

and: FILE L;DEV=LP Return

and: SYSDUMP *T,*L Return

To answer the question "ANY CHANGES?", press Return

When you see "ENTER DUMPDATE", do one of two things:

- For a full backup, type: 0 Return
- For a partial backup, type the date (mm/dd/yy) of the most recent full backup, followed by a carriage return. For example, "November 7, 1985" would be represented "11/07/85".

To respond to "ENTER DUMPFILE SUBSETS", type: @.@.@ Return

To respond to "LIST FILES DUMPED", type: Y Return

Continue with Step Five, page 7-35, to respond to the tape request.

After You've Completed The Backup

Once you're through with the backup, and you've labelled and put away your tapes, you can let people begin using the computer again. To do so, you need to:

- Reset the job limit and session limit to their original values.
- Reset the jobfence to its normal level.
- Start any suspended jobs.

Reset The Job And Session Limits

If you don't remember the original job and session limit, check the numbers you wrote down in Chapter Two on page 2-27. Using these numbers,

type: LIMIT nn,nn Return

(your original job limit) ↑ ↑ *(your original session limit)*

To check the new limits, type: SHOWOUT STATUS Return

The last line should report the correct job limit ("JLIMIT") and session limit ("SLIMIT") for your computer. If it doesn't, type the LIMIT command again.

Reset The Jobfence

Reset the jobfence to its original value. If you don't remember what it is, check the number you wrote down in Chapter Two, on page 2-27. Using this number,

type: JOBFENCE nn Return

↑ *(use your original jobfence)*

To check it, type: SHOWJOB STATUS Return

If the computer doesn't report the right number, repeat the JOBFENCE command.

Start Any Suspended Jobs

If, before doing the backup, you had to temporarily stop any jobs, now's the time to restart them.

To find out, type: SHOWJOB Return

The computer will list your session, and any suspended jobs, like this:

```
JOBNUM  STATE IPRI JIN   JLIST    INTRODUCED  JOB NAME

#S184   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
```

For each suspended job,

type: RESUMEJOB #Jnnn Return

↑ *(use the job number from the first column on your screen)*

Repeat the RESUMEJOB command for each job listed as "SUSP". When you've finished, check on them.

Type: SHOWJOB Return

The list will 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

#S184   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
   1 EXEC; INCL 1 SESSIONS
   1 SUSP
JOBFENCE= nn; JLIMIT= nn; SLIMIT= nn
```

Advanced Topics

The following information is optional. If you're comfortable with the material in the rest of the chapter, feel free to read this. The topics are:

- Streaming A Job To Do A Backup
- Creating A Coldload Tape

A prerequisite for the first topic is a good working knowledge of how to create and process jobs. Read Chapter Three if you need more information or just want to refresh your memory.

The second topic, "Creating A Coldload Tape", teaches you how to create a tape that you can use to restart the computer system.

Streaming A Job To Do A Backup

As you've seen, a system backup can be a tedious process. It's possible to skip most of the preliminary steps (preparing for the backup) and automate the rest. Doing this requires two things: timing, and a job file.

Timing is critical because it's the one way of avoiding most of the preliminaries. If you plan the backup at midnight, for example, it's a good bet that everyone (except the real workaholics) will be home asleep. You won't need to warn people about the backup, make sure they log off, and otherwise curtail system activity.

Still, how will you command the computer to start duplicating files? Easy: include the instructions in a job file, then schedule the job to begin at night. On the next page is a summary of what you'll do, and what the job will do for you.

Task	When To Do It
Answer Console requests	Before leaving work at night
Prepare the tape	Before leaving work at night
Insert/mount the tape	Before leaving work at night
Remove the tape	Early the next morning
Label the tape	Early the next morning

You may have noticed from this summary that there are two things that the job can't do for you.

- Jobs can't change tapes.
- Jobs can't answer a tape request.

If you use more than one tape to back up the system, or if tape requests aren't automatically answered by your computer, you'll have to do the backup yourself.

There's one final requirement: you must be able to schedule jobs on your computer system. If you're not sure, check the version number of your operating system (it should be written down in Chapter One, on page 1-2). If it begins with "G.01", then you can schedule a job to back up your system.

Type each line of instructions on the next few pages into a file "as is", or get someone to help you modify it for your needs.

Type: `!JOB BACKUP, OPERATOR.SYS, PUB; HIPRI` Return

and: `!COMMENT**********...*********` Return

and: `!COMMENT THIS JOB WILL AUTOMATICALLY DO A ****` Return

and: `!COMMENT PARTIAL BACKUP ON MONDAY THRU *****` Return

and: `!COMMENT THURSDAY AND A FULL BACKUP ON FRIDAY*` Return

and: `!COMMENT**********...*********` Return

and: `!FILE DUMPTAPE;DEV=TAPE` Return

and: `!SETJCW MONDAY=2` Return

and: `!SETJCW TUESDAY=3` Return

and: `!SETJCW WEDNESDAY=4` Return

and: `!SETJCW THURSDAY=5` Return

and: `!SETJCW FRIDAY=6` Return

and: `!IF HPDAY >= MONDAY AND HPDAY <= THURSDAY THEN` Return

and: `!  TELLOP PARTIAL BACKUP IS STARTING NOW` Return

and: `!  CONTINUE` Return

and: `!  PARTBACKUP *DUMPTAPE` Return

and: `!  IF JCW >= FATAL THEN` Return

and: `!  TELLOP PARTIAL SYSTEM BACKUP FAILED!!!` Return

and: `!  TELLOP PLEASE INFORM THE SYSTEM MANAGER` Return

and: !␣␣␣␣␣TELLOP␣AND␣THEN␣STREAM␣BKUPJOB.PUB.SYS Return

and: !␣␣␣ELSE Return

and: !␣␣␣␣␣TELLOP␣PARTIAL␣SYSTEM␣BACKUP␣SUCCESSFUL Return

and: !␣␣␣␣␣COMMENT-STREAM␣JOB␣FOR␣TOMORROW␣AT␣10PM Return

and: !␣␣␣␣␣IF␣HPDAY=MONDAY␣THEN Return

and: !␣␣␣␣␣␣␣␣STREAM␣BKUPJOB;DAY=TUESDAY;AT=22:00 Return

and: !␣␣␣␣␣␣ENDIF Return

and: !␣␣␣␣␣IF␣HPDAY=TUESDAY␣THEN Return

and: !␣␣␣␣␣␣␣␣STREAM␣BKUPJOB;DAY=WEDNESDAY;AT=22:00 Return

and: !␣␣␣␣␣␣ENDIF Return

and: !␣␣␣␣␣IF␣HPDAY=WEDNESDAY␣THEN Return

and: !␣␣␣␣␣␣␣␣STREAM␣BKUPJOB;DAY=THURSDAY;AT=22:00 Return

and: !␣␣␣␣␣␣ENDIF Return

and: !␣␣␣␣␣IF␣HPDAY=THURSDAY␣THEN Return

and: !␣␣␣␣␣␣␣␣STREAM␣BKUPJOB;DAY=FRIDAY;AT=22:00 Return

and: !␣␣␣␣␣␣ENDIF Return

and: !␣␣␣ENDIF Return

and: !ELSE Return

and: !␣␣␣IF␣HPDAY=FRIDAY␣THEN Return

and: `!  TELLOP FULL BACKUP IS STARTING NOW` Return

and: `!  CONTINUE` Return

and: `!  FULLBACKUP *DUMPTAPE` Return

and: `!  IF JCW >= FATAL THEN` Return

and: `!  TELLOP FULL SYSTEM BACKUP FAILED!!!` Return

and: `!  TELLOP PLEASE INFORM SYSTEM MANAGER` Return

and: `!  TELLOP THEN STREAM BKUPJOB.PUB.SYS` Return

and: `!  ELSE` Return

and: `!  TELLOP FULL SYSTEM BACKUP SUCCESSFUL` Return

and: `!  COMMENT-STREAM JOB FOR MONDAY 10PM` Return

and: `!  STREAM BKUPJOB;DAY=MONDAY;AT=22:00` Return

and: `!  ENDIF` Return

and: `!  ELSE` Return

and: `!  TELLOP BACKUP JOB LOGGED ON DURING WKEND` Return

and: `!  TELLOP IT IS BEING RESTREAMED` Return

and: `!  TELLOP TO RUN MONDAY.` Return

and: `!  STREAM BKUPJOB;DAY=MONDAY;AT=22:00` Return

and: `!  ENDIF` Return

and: `!ENDIF` Return

and: !TELLOP BACKUP JOB IS LOGGING OFF Return

and: !EOJ Return

and: !// Return

and: !KEEP BKUPJOB.PUB.SYS Return

and: !EXIT Return

IMPORTANT

Chances are, you probably mistyped some of this information. If so, the job file will not work like it should. Double check each line, and correct any mistakes you find. Save the corrected version of the file, using the same file name, and purge the old copy.

Start Things Up Before Going Home

When it's time to go home, start the backup. To get it going,

type: STREAM BKUPJOB.OPERATOR.SYS Return

Take care of these details, and you'll be off:

- Get rid of any Console requests.
- Prepare the tape.
- Insert or mount the tape.

Wrap Things Up The Next Morning

The following morning, remove and secure the tape. If you're using cartridge tapes, point the arrow towards SAFE. To protect the information on reel tapes, remove the write ring.

Label and store the tape. Finally, pick up your report from the printer and file it.

How To Handle Future Backups

You will have to use the STREAM command to restart the backup job if any of the following situations arise:

- Someone starts the computer using a coolstart, coldstart, update, or a reload. Since scheduled jobs aren't saved when the computer is started in these ways, you'll need to restart the job:

  Type: `STREAM BKUPJOB.PUB.SYS` Return

- You skip doing a backup for one or more days.
- Today's backup procedure will require more than one tape.

  In either of these situations, you must abort the old job file before restarting it. To do so, find out its job number, then use the number in the ABORTJOB command.

  Type: `SHOWJOB SCHED` Return

  Look for "BKUPJOB" in the last column, then read across to the first column to find the job number.

  Type: `ABORTJOB #Jnnn` Return

  ↑ *(use the job number from your screen)*

  Then, either restart the job or back up the system on your own.

Creating A Coldload Tape

You can use backup tapes to replace a file that is lost or damaged. To do so, you would use the RESTORE command, which is explained in Chapter Six, to transfer the good copy (on tape) to your computer's disc.

A coldload tape is a little different. It contains only the files that make up your operating system and application programs, but no files belonging to users. A coldload tape can be used to start your computer.

Coldload tapes also differ from backup tapes in that you don't create them on a daily basis. In fact, a new coldload tape only needs to be created when:

- A new piece of hardware, like a terminal, is added to or removed from your system.
- The system configuration is changed. (For a brief explanation of system configuration, refer to Chapter One.)
- Software is either installed or updated.

In other words, a new coldload tape should be created whenever your computer's hardware or software changes. Such changes are your System Manager's responsibility. For this reason, he or she is also usually responsible for creating new coldload tapes.

The process, though, is not much different than the one you followed to create a backup tape. In fact, you'll perform all the preliminary steps to curtail system activity. You'll select, prepare, and handle the tapes in exactly the same way you did to back up the computer. But, when it comes to typing in the commands, the similarity ends.

To create a coldload tape, use the information in this chapter to perform each of the following steps.

1. Begin to shutdown the computer system according to the directions in "Prepare For The Backup", beginning on page 7-7.
2. Select and prepare a cartridge or reel tape.
3. Insert or mount the tape.
4. If you're using cartridge tapes,

   type: FILE T;DEV=CTAPE Return

   If you're using reel tapes,

   type: FILE T;DEV=TAPE Return
5. Regardless of what type of tape you're using,

   type: FILE SYSDLIST;DEV=LP Return

   and: SYSDUMP *T Return
6. As you've seen before, the computer responds to the SYSDUMP command by printing the first of a series of questions on your screen, which begins the SYSDUMP dialog. As you answer each question, a new one is displayed until the dialog ends.

   The first question you'll see is this:

```
ANY CHANGES?_
```

7. If there are no changes, type: NO Return or: Return

IMPORTANT

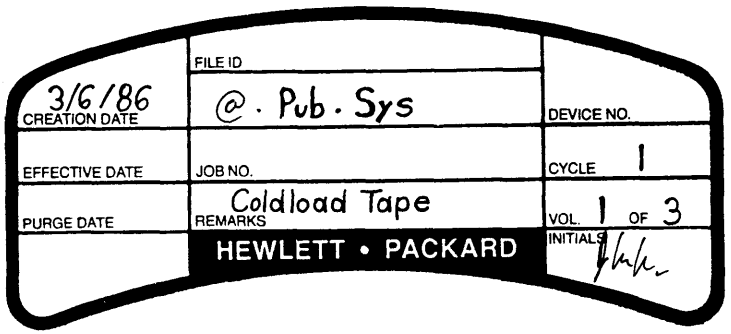
In this dialog, pressing Return means the same thing as answering "no" or "no changes".

IMPORTANT

If your System Manager has asked you to create a new Coldload tape because of a specific change to the hardware or software, you would answer the first question by typing "yes". In this case, though, you can expect precise instructions for responding to the remaining questions from your System Manager.

8. When you see "ENTER DUMPDATE:", type: 0 Return
9. When you see "ENTER DUMPFILE SUBSETS:",
   type: @.PUB.SYS Return
   ↑ *(this means all files in the PUB group of the SYS account)*
10. When you see "LIST FILES DUMPED?" type: YES Return
11. Reply to the tape request, if one appears.

    After ten minutes or so, the first of several progress messages will appear on the Console. They'll let you know what's happening at one minute intervals.
12. If you need another tape to continue, you'll see a message to that effect. Rewind and remove the tape, and turn the arrow toward SAFE (on a cartridge tape) or remove the write ring (on a reel tape).
13. Label the tape just as you labelled backup tapes, with one exception: Under "REMARKS", indicate that it is a Coldload tape.



14. Choose another tape and start over again.

IMPORTANT

If you're continuing the procedure with a second or third tape, you won't need to retype the FILE or SYSDUMP commands or answer a tape request.

15. You are finished when you see this:

```
END OF SUBSYSTEM
:
```

16. Remove the last tape, secure, and label it.
17. Pick up your report from the printer.

For More Information

To learn more about system backup and creating coldload tapes, refer to the MPE V/R Commands Reference Manual (Part Number 32033-90006). It describes the PARTBACKUP, FULLBACKUP, and SYSDUMP commands that you've used in this chapter.

Looking Back

1. Why should you backup your system on a regular basis?

2. What are three differences between a full backup and a partial backup?

3. What are the five basic things you do to prepare for a backup?

4. If you type SHOWJOB just before you begin the backup, what will you see?

5. When, why, and how do you create a coldload tape?

System Backup Quick Reference

To Do:	Do This:
Back up the computer:	1. Type: LIMIT 0,0 Return 2. Type: JOB FENCE 14 Return 3. Type: WARN @S; BACKUP WILL BEGIN and: IN TEN MINUTES and: PLEASE LOG OFF Return 4. Type: RECALL Return 5. For each Console request, hold down CTRL and type: A and type: REPLY nn,0 Return ↑ *(the PIN)* 6. Type: SHOWJOB Return 7. For each executing job, type: BREAKJOB #Jnnn Return 8. Type: WARN @S;LOG OFF NOW. BACKUP and: ABOUT TO BEGIN Return 9. Abort each session except your own: Type: ABORTJOB #Snnn Return 10. Verify that there are no executing jobs, and no sessions but your own: Type: SHOWJOB Return 11. Prepare your first backup tape. Point the arrow on a cartridge tape away from SAFE; insert a write ring into a reel tape. 12. Insert/mount the tape. On a cartridge tape drive, wait for the BUSY light to go out. On a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons.

To Do:	Do This:
Back up the computer: *(continued)*	13. Type in the commands: If a partial backup, type: FILE SYSDLIST;DEV=LP Return and: PARTBACKUP Return If a full backup, type: FILE SYSDLIST;DEV=LP Return and: FULLBACKUP Return 14. Reply to the tape request if one appears. Hold down CTRL and type: A Type: REPLY nnn,n Return *(the PIN)* ↑ ↑ *(the LDEV number)* 15. Follow your progress on the Console screen. 16. Remove the tape. On a reel tape drive, press REWIND to rewind the tape, then take the reel off the drive. (Cartridge tapes rewind automatically.) 17. Secure the files. On a cartridge tape, turn the arrow towards SAFE; on a reel tape, remove the write ring. 18. Label your backup tape. **IMPORTANT** **If you are not finished with the backup, go back to Step #11 and repeat Steps #11 through #18 with another tape. If you are finished, continue with the next step.** 19. Get your printed report. 20. Type: SHOWJOB Return For each suspended job, type: RESUMEJOB #Jnnn Return 21. Type: JOBFENCE n Return ↑ *(use your original jobfence or 7)* 22. Reset the job and session limits to their original values: Type: LIMIT n,n Return *(use your original job limit)* ↑ ↑ *(use your original session limit)*

To Do:	Do This:

Create a Coldload tape:

1. Prepare the system in the same way you prepared for a backup:
   - Reset limits and fences
   - Answer all tape requests
   - Suspend all jobs
   - Abort all sessions, except your own.
2. Prepare your first tape. Point the arrow on a cartridge tape away from SAFE; insert a write ring into a reel tape.
3. Insert/mount the tape. On a cartridge tape drive, wait for the BUSY light to go out; on a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons.
4. Type: **FILE SYSDLIST;DEV=LP** Return

   and: **SYSDUMP *T** Return
5. When you see "ANY CHANGES?", you can do one of two things:

   If you are reconfiguring the system, type: **YES** Return

   At this time, ask your System Manager for help with the remainder of the dialog.

   If you are not reconfiguring the system, type: **NO** Return
6. For each message that appears, answer as indicated:

   "ENTER DUMPDATE:" Type: **0** Return
   "ENTER DUMPFILE SUBSETS:" Type: **@.PUB.SYS** Return
   "LIST FILES DUMPED?" Type: **YES** Return
7. Follow your progress on the Console screen.
8. Remove the tape. On a reel tape drive, press REWIND to rewind the tape, then take the reel off the drive. (Cartridge tapes rewind automatically.)
9. Secure the files. On a cartridge tape, turn the arrow towards SAFE; on a reel tape, remove the write ring.
10. Label your Coldload tape.

To Do:	Do This:

Create a Coldload tape: *(continued)*

IMPORTANT

If you need another tape to continue, get one and go back to Step #2. Repeat Steps #2 through #10. When you are finished, continue with the next step.

11. Get your printed report.
12. Type: SHOWJOB Return

    For each suspended job, type: RESUMEJOB #Jnnn Return
13. Type: JOBFENCE n Return

    ↑ *(use your original jobfence or 7)*
14. Reset the job and session limits to their original values:

    Type: LIMIT n,n Return

    (use your original job limit) ↑ ↑ *(use your original session limit)*

Introduction To Chapter Eight

Before anyone can use your computer system, it must be started. This chapter teaches you how to do this.

"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, disc drives, tape drives, printers, and the Console. That's because, during normal usage, computer hardware remains on. If the hardware is ever turned off, your System Manager or Hewlett-Packard Customer Engineer will be close by to supervise the process.

There are five ways to start the operating system:

- Warmstart, the method you'll use after a system hang, failure, or power fail, or when you need to save spool files or scheduled jobs.
- Coolstart, which you'll use after a normal, scheduled system shutdown.
- Coldstart, which starts the computer from a completely "clean" copy of the operating system stored on tape. You'll coldstart the computer at the recommendation of your System Manager, who may also supervise the process.

The last two startup options, explained only briefly in this chapter, are your System Manager's responsibility:

- Update, as the name implies, is used to update your computer's software.
- Reload, your last resort if all other startup options fail.

8 System Startup

Has The Computer Been Started?

There's a simple way to find out if you need to start your computer system: turn on the power to the Console, if it isn't on already, and allow about a minute for it to warm up.

On the Console keyboard, press Return

Do you see a colon prompt? If so, type: **SHOWME** Return

If the computer responds with a message of some sort, then the system has been started. Furthermore, if the response is a description of your session like the one below, then you're logged onto the Console.

```
USER: #S2,OPERATOR.SYS,OPERATOR      (NOT IN BREAK)
MPE VERSION:  HP32033G.01.01.       (BASE G.01.01).
CURRENT:  WED JUNE 19, 1985,  3:37 PM
LOGON:    WED JUNE 19, 1985,  2:36 PM
CPU SECONDS: 8           CONNECT MINUTES:  242
$STDIN LDEV: 20          $STDLIST LDEV:  20
```

If the computer tells you it "EXPECTED HELLO. . .", then the system has been started, but no one is logged onto the Console. In this case, you just need to start your session.

Type: **HELLO OPERATOR.SYS** Return

The computer will prompt you for any passwords, then display logon information. Finally, you'll see the colon prompt on the left side of the screen.

IMPORTANT

If you only see a blinking cursor, and no prompt, wait a minute to make sure your Console has warmed up. Press Return several times. If you still see nothing but the blinking cursor, then it's likely that the power to your computer has been turned off. Call your System Manager for help, or consult the manuals that came with the hardware for instructions about turning the power to your equipment on.

If you don't see the colon prompt, do you see something like this on the screen?

```
H for help->_
```

Or this?

```
M>_
```

These are called "Control-B" prompts because you generate them by pressing the CTRL key and B at the same time. (The important thing to look for is the arrow, ">", next to the blinking cursor. The phrase or letter that precedes the arrow varies from system to system.)

You probably do need to start your computer system, but check one more thing to make sure:

At the Control-B prompt, type: E X I T [Return]

Then press [Return] again.

This takes you out of "Control-B mode" and, if the system were already started, you'd see the colon prompt printed on your screen.

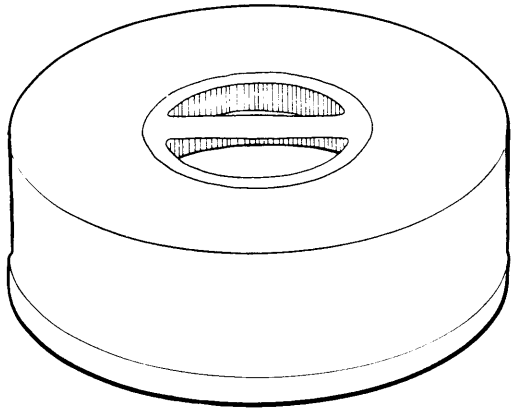
```
H for help-> EXIT (what you typed)

:_
```

If you don't see the colon, hold down [CTRL] and type: B

You'll see the ">" prompt on your screen again. You now know that you need to start the computer.

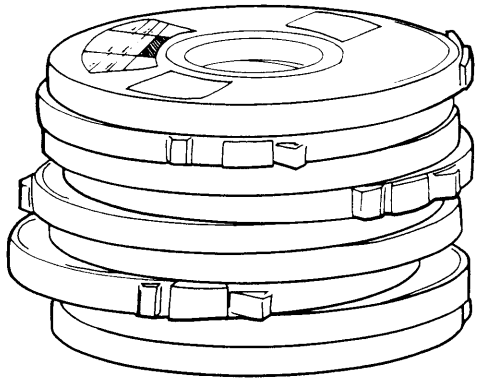
Starting Your Computer System

When you start the operating system, you transfer programs that are stored permanently on disc or on a tape to the computer. You'll almost always start the system in one of two ways: a "warmstart" or a "coolstart". The three other ways to start the computer—a "coldstart", "update", and "reload"—are required only in specific situations. Although you'll occasionally coldstart the system on your own, you'll rarely update or reload the computer without your System Manager's help or supervision.



Warmstart

Coolstart



Coldstart

Update

Reload

Warmstarts and coolstarts are easier and less time consuming than the other methods because everything you need to start the computer is on disc. The only thing you'll do is type the answer to a few questions at the Console.

Which Startup Option Do You Use?

Use the "warmstart" option:

- After a system hang or failure.
- Anytime you need to save spool files and scheduled jobs.

Use the "coolstart" option:

- After a routine shutdown of your computer system.
- When the space on your disc(s) has become fragmented, a problem that typically affects the disc used to store spool files. For more information, refer to the discussion of "SPOOFLE I/O ERRORS" in Chapter Four.
- If a warmstart failed.

Use the "coldstart" option:

- When you change the configuration of your computer system by adding or removing equipment or changing the system software. In this case, you'll use a coldload tape (explained in Chapter Seven) to start the computer.
- If a coolstart failed.
- If a previous coldstart failed.

Use the "update" option:

- To install a new version of the operating system.
- If a coldstart failed after the second attempt to coolstart the system.

A reload is always the last resort, and should never be attempted without notifying your System Manager. Reload the system only:

- When you need to make a major change to the system software.
- If important system files are erased or destroyed.
- When the space on your disc(s) is fragmented and a coolstart doesn't solve the problem. For more information, refer to the discussion of "SPOOFLE I/O ERRORS" in Chapter Four.
- If you tried to start the system using the update option and it failed.

This chapter explains how to do a warmstart and a coolstart. It also explains a coldstart, since of the three startup options using tapes, you're more likely to coldstart the computer. Because your System Manager is responsible for doing an update or a reload, this chapter doesn't explain them. For information, refer to these other manuals:

- The HP 3000 Software Update Manual (Part Number 32033-90036). It explains how to update your computer.
- The Series 37 Software Installation Manual (Part Number 32033-90037).
- The HP 3000 Software Installation Manual (Part Number 32033-90039).

Warmstart

Use the "warmstart" option:

- After a system hang or failure.
- Anytime you need to save spool files and scheduled jobs.

Step One: Check For The Control-B Prompt

On the Console keyboard, press: Return

Look for the Control-B prompt, which is an arrow next to the blinking cursor. (Ignore whatever precedes the arrow; it varies from system to system.) If you don't see it, go back to the beginning of this chapter to see if the computer's been started.

Step Two: Tell The Computer To Start

Type: **START** Return

```
WHICH OPTION (WARMSTART/COOLSTART)?_
```

Type: **WARM** Return

The computer begins by sending you this warning:

```
**WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP
PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS
```

This message means:

- DO NOT turn off the power to the computer.
- DO NOT generate the Control-B prompt (>).

If you do this before " *WELCOME* " appears, you'll have to reload the operating system, which literally can take days. If you do this after " *WELCOME* " appears, you'll have to start over at the beginning of this chapter.

Step Three: Watch For Progress Reports

Soon after the warning, the computer begins sending you progress reports about the startup procedure. You're not expected to undertand what each of the messages means. If nothing else, they reassure you that something is happening.

```
DIRECTORY MAINTENANCE COMPLETED
LOADING OF SYSTEM FILES IN PROGRESS
LOADING OF SYSTEM FILES COMPLETED
PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP
PART 2 OF 6 COMPLETED - SL BINDING
PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION
PART 4 OF 6 COMPLETED - DRIVER LOADING
PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP
PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION
BANK 0 DEPENDENT MEMORY USED -
```

IMPORTANT

These progress messages, and some of the other messages included in the examples throughout this chapter, are a feature of the G.01.00 version of MPE. If you're using an earlier version of the operating system, you won't see them. You will, however, be asked the same series of questions that guide you in starting the system.

The last message asks you to type in or verify the date and time. On a Series 37 computer, you'll see something like this:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
```

The date and time you see will be different, of course, but if you see a message like the one above, skip to Step Six on the next page.

Other models of the HP 3000 computer don't have an internal clock to keep track of time. If you're using something other than the Series 37, you'll see this:

```
DATE (M/D/Y)?_
```

Follow the directions in the next step to set the date and time.

Step Four: Set The Date And Time

Type today's date, beginning with the month, then the day, then the year. For example:

If today is June 18, 1985, type: 0 6 / 1 8 / 8 5 Return

The computer will then ask you for the correct time:

```
TIME (H:M)?_
```

Type the time using a 24-hour (military) clock. For example:

If it's 8:35 in the morning, type: 0 8 : 3 5 Return

But, if it's 8:35 in the evening, type: 2 0 : 3 5 Return

Step Five: Verify The Date And Time

If you've just typed in the date and time, or if the computer keeps track of it for you, it will ask for verification:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
   ↑ (it figures out the day for you)
```

If either the date or time is incorrect, type: N O Return

You'll then see:

```
DATE (M/D/Y)?_
```

To type the correct date and time, go back to Step Four.

If both the date and time are correct, type: **YES** Return

You'll see the " *WELCOME* " message on the Console and, in most cases, the computer will automatically start your session:

```
*WELCOME*
:HELLO OPERATOR.SYS;HIPRI

                    (and some other information)
```

IMPORTANT

If your session wasn't automatically started, you'll have to log onto the Console yourself. To do so,

type: HELLO OPERATOR.SYS;HIPRI Return

Adding "HIPRI" allows you to start a session regardless what the session limit or jobfence is set to. If you see an error message, you're probably not assigned OP capability (and, therefore, not allowed to log on with high priority). The computer may still have started your session, though. To check,

type: SHOWME Return

If you see "EXPECTED HELLO. . .", contact your System Manager.

You've just "warmstarted" the computer. Since there are probably some final details to take care of, skip to "Taking Care Of The Final Details" on page 8-22.

Coolstart

Use the "coolstart" option:

- After a routine shutdown of your computer system.
- When the space on your disc(s) has become fragmented, a problem that typically affects the disc used to store spool files. For more information, refer to the discussion of "SPOOFLE I/O ERRORS" in Chapter Four.
- If a warmstart fails.

IMPORTANT

The procedure for "coolstarting" your computer is nearly identical to a warmstart. If you've just read the preceding section, the explanation below will repeat much of the information you already know.

Step One: Check For The Control-B Prompt

On the Console keyboard, press: Return

Look for the Control-B prompt, which is an arrow next to the blinking cursor. (Ignore whatever precedes the arrow; it varies from system to system.) If you don't see it, go back to the beginning of this chapter to see if the computer's been started.

Step Two: Tell The Computer To Start

Type: **S T A R T** Return

```
WHICH OPTION (WARMSTART/COOLSTART)?_
```

Type: C O O L Return

The computer then asks you if you want to make any changes to the system. Unless your System Manager tells you otherwise, answer no.

```
ANY CHANGES?_
```

Type: N O Return

You'll then see this warning:

```
**WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP
PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS
```

This message means:

- DO NOT turn off the power to the computer.
- DO NOT generate the Control-B prompt (>).

If you do this before " *WELCOME* " appears, you'll have to reload the operating system, which literally can take days. If you do this after " *WELCOME* " appears, you'll have to start over at the beginning of this chapter.

Step Three: Watch For Progress Reports

Soon after the warning, the computer begins sending you progress reports about the startup procedure. You're not expected to undertand what each of the messages means. If nothing else, they reassure you that something is happening.

```
DIRECTORY MAINTENANCE COMPLETED
LOADING OF SYSTEM FILES IN PROGRESS
LOADING OF SYSTEM FILES COMPLETED
PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP
PART 2 OF 6 COMPLETED - SL BINDING
PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION
PART 4 OF 6 COMPLETED - DRIVER LOADING
PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP
PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION
BANK 0 DEPENDENT MEMORY USED -
```

The last message asks you to type in or verify the date and time. On a Series 37 computer, you'll see something like this:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
```

The date and time you see will be different, of course, but if you see a message like the one above, skip to Step Five on the next page.

Other models of the HP 3000 computer don't have an internal clock to keep track of time. If you're using something other than the Series 37, you'll see this:

```
DATE (M/D/Y)?_
```

Step Four: Set The Date And Time

Type in today's date, beginning with the month, then the day, then the year. For example:

If today's date is June 18, 1985, type: 0 6 / 1 8 / 8 5 Return

The computer will then ask you for the correct time, like this:

```
TIME (H:M)?_
```

Type in the time using a 24-hour (military) clock. For example:

If it's 8:35 in the morning, type: 0 8 : 3 5 Return

If it's 8:35 in the evening, type: 2 0 : 3 5 Return

Step Five: Verify The Date And Time

If you've just typed in the date and time, or if the computer keeps track of it for you, it will ask for verification:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
   ↑ (it figures out the day for you)
```

If either the date or time is incorrect, type: N O Return

You'll then see:

```
DATE (M/D/Y)?_
```

To type the correct date and time, go back to Step Four.

If both the date and time are correct, type: Y E S Return

You will see the " *WELCOME* " message on the Console and, in most cases, the computer will automatically start your session:

```
*WELCOME*
:HELLO OPERATOR.SYS;HIPRI

                    (and some other information)
```

IMPORTANT

If your session wasn't automatically started, you'll have to log onto the Console yourself. To do so,

type: HELLO OPERATOR.SYS;HIPRI Return

Adding "HIPRI" allows you to start a session regardless of the session limit or jobfence. If you see an error message, you're probably not assigned OP capability (and, therefore, not allowed to log on with high priority). The computer may still have started your session, though. To check,

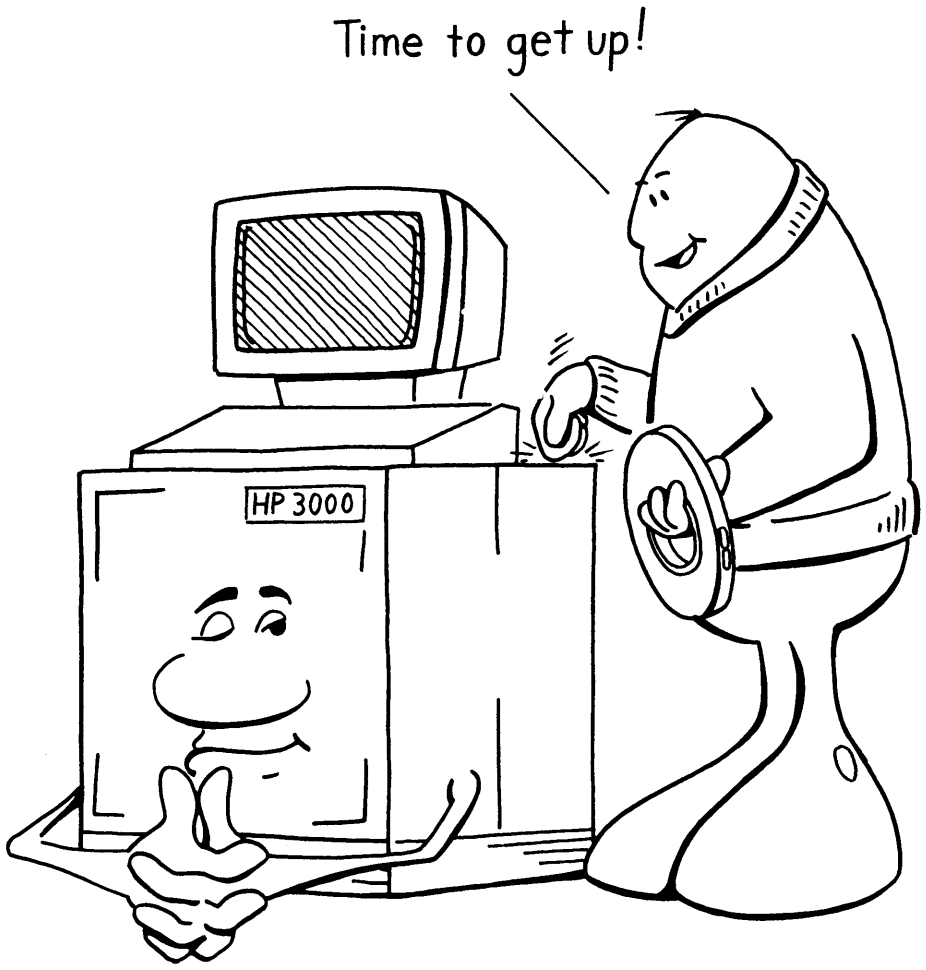
type: SHOWME Return

If you see "EXPECTED HELLO. . .", contact your System Manager.

You've just "coolstarted" the computer. Since there are probably some final details to take care of, skip to "Taking Care Of The Final Details" on page 8-22.

Coldstart

To coldstart your computer system, you'll use a tape and the tape drive. For this reason, it involves a little bit more than typing commands and answering questions.



You need the most recent coldload tape to coldstart the computer. It should be clearly labelled "coldload tape", and not "backup tape", "STORE tape", or something else. Also, check the date to make sure the tape includes your latest system configuration changes. If you're not sure, check with your System Manager.

Use the "coldstart" option:

- When you change the configuration of your computer system by adding or removing equipment, or changing the system software.
- If a coolstart failed.
- If a previous coldstart failed.

Step One: Check For The Control-B Prompt

On the Console keyboard, press: Return

Look for the Control-B prompt, which is an arrow next to the blinking cursor. (Ignore whatever precedes the arrow; it varies from system to system.) If you don't see it, go back to the beginning of this chapter to see if the computer's been started.

Step Two: Insert Or Mount The Coldload Tape

If you're using a cartridge tape, insert it into the tape drive and wait for the BUSY light to go out. If you're using a reel tape, mount the tape and put the tape drive online. (Complete tape handling instructions are included in Chapter Seven. For cartridge tapes, refer to page 7-14. For reel tapes, refer to page 7-28.)

Step Three: Tell The Computer To Load The Information From The Tape

On the Console keyboard, type: LOAD Return

```
WHICH OPTION (COLDSTART/RELOAD/UPDATE)?
```

To answer this question, type: COLD Return

When asked if there are any changes, answer "no" unless your System Manager tells you otherwise:

```
ANY CHANGES?
```

Type: NO Return

You'll then see this warning:

```
**WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP
PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS
```

This message means:

- DO NOT turn off the power to the computer.
- DO NOT generate the Control-B prompt (>).

  If you do this before " *WELCOME* " appears, you'll have to reload the operating system, which literally can take days. If you do this after " *WELCOME* " appears, you'll have to start over at the beginning of this chapter.

Step Four: Watch For Progress Reports

Soon after the warning, the computer begins sending you progress reports about the startup procedure. You're not expected to undertand what each of the messages means. If nothing else, they reassure you that something is happening.

```
DIRECTORY MAINTENANCE COMPLETED
LOADING OF SYSTEM FILES IN PROGRESS
LOADING OF SYSTEM FILES COMPLETED
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PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION
PART 4 OF 6 COMPLETED - DRIVER LOADING
PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP
PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION
BANK 0 DEPENDENT MEMORY USED -
```

The last message asks you to type in or verify the date and time. On a Series 37 computer, you'll see something like this:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
```

The date and time you see will be different, of course, but if you see a message like the one above, skip to Step Five on the next page.

Other models of the HP 3000 computer don't have an internal clock to keep track of time. If you're using something other than the Series 37, you'll see this:

```
DATE (M/D/Y)?_
```

Step Five: Set The Date And Time

Type in the date, beginning with the month, then the day, then the year. For example:

If today is June 18, 1985, type: 0 6 / 1 8 / 8 5 Return

The computer will then ask you for the correct time, like this:

```
TIME (H:M)?_
```

Type in the time using a 24-hour (military) clock. For example:

If it's 8:35 in the morning, type: 0 8 : 3 5 Return

If it's 8:35 in the evening, type: 2 0 : 3 5 Return

Step Six: Verify The Date And Time

If you've just typed in the date and time, or if the computer keeps track of it for you, it will ask for verification:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
   ↑ (it figures out the day for you)
```

If either the date or time is incorrect, type: N O Return

You'll then see:

```
DATE (M/D/Y)?_
```

To type the correct date and time, go back to Step Five.

If both the date and time are correct, type: Y E S Return

You will see the " *WELCOME* " message on the Console and, in most cases, the computer will automatically start your session:

```
*WELCOME*
:HELLO OPERATOR.SYS;HIPRI

                    (and some other information)
```

IMPORTANT

If your session wasn't automatically started, you'll have to log onto the Console yourself. To do so,

type: HELLO OPERATOR.SYS;HIPRI Return

Adding "HIPRI" allows you to start a session regardless what the session limit or jobfence is set to. If you see an error message, you're probably not assigned OP capability (and, therefore, not allowed to log on with high priority). The computer may still have started your session, though. To check,

type: SHOWME Return

If you see "EXPECTED HELLO. . .", contact your System Manager.

Remove the coldload tape. Then, take care of the last few details.

Taking Care Of The Final Details

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.

In addition to checking these values, you might need to transfer spool files from a SPOOK tape to your computer's disc so that they can be printed.

Check And Set The Job And Session Limit

Type: SHOWJOB_STATUS Return

The last line of information on your screen tells you the current values for your job limit ("JLIMIT") and session limit ("SLIMIT").

If you know what the values should be, set them now, using the LIMIT command:

Type: LIMIT_nn,nn Return

(the job limit) ↑ ↑ *(the session limit)*

If you're not sure what the limits should be, set them to the values you recorded in Chapter Two (page 2-27) or in Chapter Three (page 3-2).

IMPORTANT

If you're uncertain what values to use, check with your System Manager. If he or she isn't 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.

To check the limits, type: SHOWJOB STATUS Return. If they're incorrect, type the LIMIT command again.

Check And Set The Jobfence

Type: SHOWJOB STATUS Return

Check the last line on your screen for the current jobfence. If it's a number other than 0 or 14, then it has been automatically set for you. Skip to "Check And Set The Outfence", below.

If the jobfence is equal to 0 or 14, reset it to 6.

Type: JOBFENCE 6 Return

To verify the jobfence, type: SHOWJOB STATUS Return

Check the last line; it should now say "JOBFENCE= 6".

Check And Set The Outfence

Like the jobfence, the outfence already may have been set for you. To check, type: SHOWOUT STATUS Return

You may see one or more outfences, like this:

```
0 FILES
   0 ACTIVE
   0 READY; INCLUDING 0 SPOOFLES, 0 DEFERRED
   0 OPENED; INCLUDING 0 SPOOFLES
   0 LOCKED; INCLUDING 0 SPOOFLES
   0 SPOOFLES; 00000 SECTORS
OUTFENCE= nn ← (the system outfence)
OUTFENCE= nn  FOR LDEV nn
          ↑ (a second separate outfence)
```

If your system-wide outfence is equal to a number other than 1 or 14, then it's been set for you during the startup procedure. If it's equal to 1 or 14, reset it:

Type: `OUTFENCE 6` Return

To check it, type: `SHOWOUT STATUS` Return

To reset individual outfences,

type: `OUTFENCE 6;LDEV=nn` Return
(your printer's LDEV number) ↑

Set The Streams Device

To allow users to stream jobs, type: `STREAMS 10` Return

If you warmstarted the computer, you're finished. Skip to "Startup Summary And Configuration Discussion", on the next page. It summarizes and reviews what you've just learned, and tells where you can get information about:

- The file SYSSTART.PUB.SYS, which your computer may use to automatically set the job and session limit, jobfence, outfence, and streams device when you start the computer.
- A logon UDC for OPERATOR.SYS, which can also automate parts of the startup procedure.

Handling Spool Files

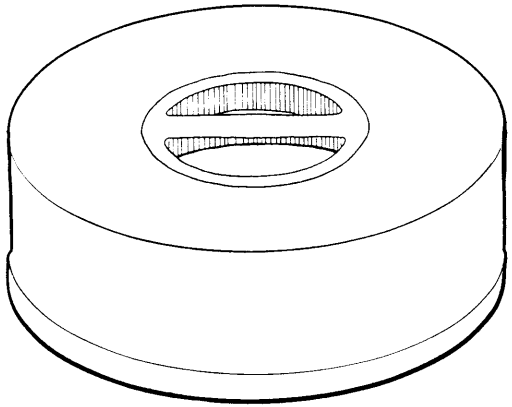
If you did a coolstart or a coldstart, and you copied spool files to a tape during the shutdown, then you have one more thing to do: transfer the spool files back to the disc. You'll find complete instructions at the end of Chapter Four, in the discussion of "Printing Reports From A SPOOK Tape".

When you're through taking care of any spool files, continue by reading the "Startup Summary And Configuration Discussion", which begins on the next page.

Startup Summary And Configuration Discussion

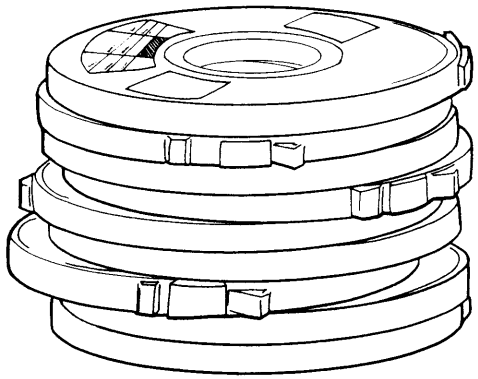
The five software startup options can be summarized as follows:

Option:	Person responsible:	Type:	Transfers programs from:
WARMSTART	System Operator	START	Disc
COOLSTART	System Operator	START	Disc
COLDSTART	Operator/Manager	LOAD	Tape
UPDATE	System Manager	LOAD	Tape
RELOAD	System Manager	LOAD	Tape



Warmstart

Coolstart



Coldstart

Update

Reload

When you start the computer, the limits, fences, and streams device may be pre-set (so that you'll only have to check them) in one of two ways:

- The system assigns values during the startup, by default.
- You (or the System Manager) assign values before the startup, by creating your own configuration in the file SYSSTART.PUB.SYS or in a logon UDC for OPERATOR.SYS.

Unless otherwise instructed, the system will assign the following values when it's started:

Option	Jobfence	Outfence	Streams	Job Limit	Session Limit
WARMSTART	14	14	off	0	0
COOLSTART	0	1	off	preset*	preset*
COLDSTART	0	1	off	preset*	preset*
UPDATE	0	1	off	preset*	preset*
RELOAD	0	1	off	preset*	preset*

* Preset by you (or the System Manager) with the program SYSDUMP.

You can change any of the values assigned by the system (or preset using the SYSDUMP program) so that the values you select automatically take effect each time the system is started. You'll do this in one of two ways:

- Create or edit the file SYSSTART.PUB.SYS. This requires version G.01.00 or later of the MPE operating system.
- Create a User-Defined Command file (UDC) that executes your instructions each time OPERATOR.SYS logs onto the Console. UDCs can be used with any version of the operating system.

This section does not include specific instructions for creating or editing UDCs or the file SYSSTART.PUB.SYS. For information about SYSSTART, refer to:

- The Communicator 3000, Volume 2, Issue 3 (Part Number 5958-3125).
- The MPE V/R System Operation and Resource Management Reference Manual (Part Number 32033-90005), update incorporated in January, 1985.

For information about UDCs, refer to:

- The MPE V/R Commands Reference Manual (Part Number 32033-90006).
- The MPE V/R System Operation and Resource Management Reference Manual (Part Number 32033-90005).

Looking Back

1. How do you determine if the system has been started or not?

2. What's the difference between a warmstart and a coolstart, and under what circumstances do you use each?

3. What do you use to coldstart the computer, and under what circumstances would you need to do so?

4. What are the other two startup options, and under what circumstances might you choose them?

5. Once the system has been started, what things might you check?

System Startup Quick Reference

To Do:	Do This:
Warmstart or coolstart the computer:	1. Type: **START** Return 2. If you're warmstarting the computer, type: **WARM** Return Skip to Step #4. If you're coolstarting the computer, type: **COOL** Return 3. When you see "ANY CHANGES?", type: **NO** Return

IMPORTANT

If there are any changes, your System Manager will tell you what they are and supervise the remainder of the process.

4. Watch the Console for the warning and progress messages.
5. Set and verify the date and time, or, if you're using a Series 37 computer, verify the date and time:

   If the date isn't displayed, type: **mm/dd/yy** Return
   (today's date, in this format) ↑

   Then type: **hh:mm** Return
   ↑ *(the correct time, using a 24-hour clock)*

   If the displayed date and time are correct, type: **YES** Return

   If they are incorrect, type: **NO** Return, then go back to the beginning of this step to set the date and time.
6. Watch the Console for the Welcome and logon message for OPERATOR.SYS.
7. If your session isn't automatically started,

   type: **HELLO OPERATOR.SYS;HIPRI** Return
8. Type: **SHOWJOB STATUS** Return
9. If the job and session limits aren't set correctly,

   type: **LIMIT nn,nn** Return
   (use your original job limit) ↑ ↑ *(use your original session limit)*

To Do:	Do This:
Warmstart or coolstart the computer: *(continued)*	11. Type: SHOWOUT STATUS Return 12. If the outfence isn't correct, type: OUTFENCE n Return *(use your original outfence or 6)* ↑ 13. Type: STREAMS 10 Return 14. Type: SHOWJOB Return 15. For each suspended job in the list, type: RESUMEJOB #Jnnnn Return 16. If you created a SPOOK tape before shutting down the computer, transfer the spool files back to the computer's disc. For directions, refer to Chapter Four.
Coldstart the computer:	1. Get your coldload tape(s). 2. Insert/mount the tape. On a cartridge tape drive, wait for the BUSY light to go out; on a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons. 3. Type: LOAD Return 4. When you see "WHICH OPTION (COLDSTART/RELOAD/UPDATE)?", type: COLD Return 5. When you see "ANY CHANGES?", type: NO Return **IMPORTANT** **If there are any changes, your System Manager will tell you what they are, and supervise the remainder of the process.** 6. Watch for the warning message on the Console.

To Do:	Do This:
Coldstart the computer: *(continued)*	7. Set and verify the date and time, or, if you're using a Series 37 computer, verify the date and time: If the date isn't displayed, type: m m / d d / y y Return *(today's date, in this format)* ↑ Then type: h h : m m Return ↑ *(the correct time, using a 24-hour clock)* If the displayed date and time are correct, type: Y E S Return If they are incorrect, type: N O Return, then go back to the beginning of this step to set the date and time. 8. Watch the Console for the Welcome and logon message for OPERATOR.SYS. 9. If your session isn't automatically started, type: H E L L O _ O P E R A T O R . S Y S ; H I P R I Return 10. Type: S H O W J O B _ S T A T U S Return 11. If the job and session limits aren't set correctly, type: L I M I T _ n n , n n Return *(use your original job limit)* ↑ ↑ *(use your original session limit)* 12. If the jobfence isn't correct, type: J O B F E N C E _ n Return *(use your original jobfence or 7)* ↑ 13. Type: S H O W O U T _ S T A T U S Return 14. If the outfence isn't correct, type: O U T F E N C E _ n Return *(use your original outfence or 7)* ↑ 15. Type: S T R E A M S _ 1 0 Return 16. Type: S H O W J O B Return 17. For each suspended job in the list, type: R E S U M E J O B _ # J n n n Return 18. If you created a SPOOK tape before shutting down the computer, transfer the spool files back to the computer's disc. For directions, refer to Chapter Four.

Introduction To Chapter Nine

This chapter teaches you how to turn the computer off in an orderly manner. This procedure, called a "system shutdown", involves a series of steps, including:

- Warning everyone well in advance of a planned shutdown.
- Telling everyone a few minutes before the shutdown.
- Preventing anyone from starting a new job or session, or printing new reports.
- Clearing the backlog of reports before the shutdown.
- Answering any Console requests.
- Suspending or aborting any jobs, and aborting any remaining sessions.
- And finally, typing the SHUTDOWN command.

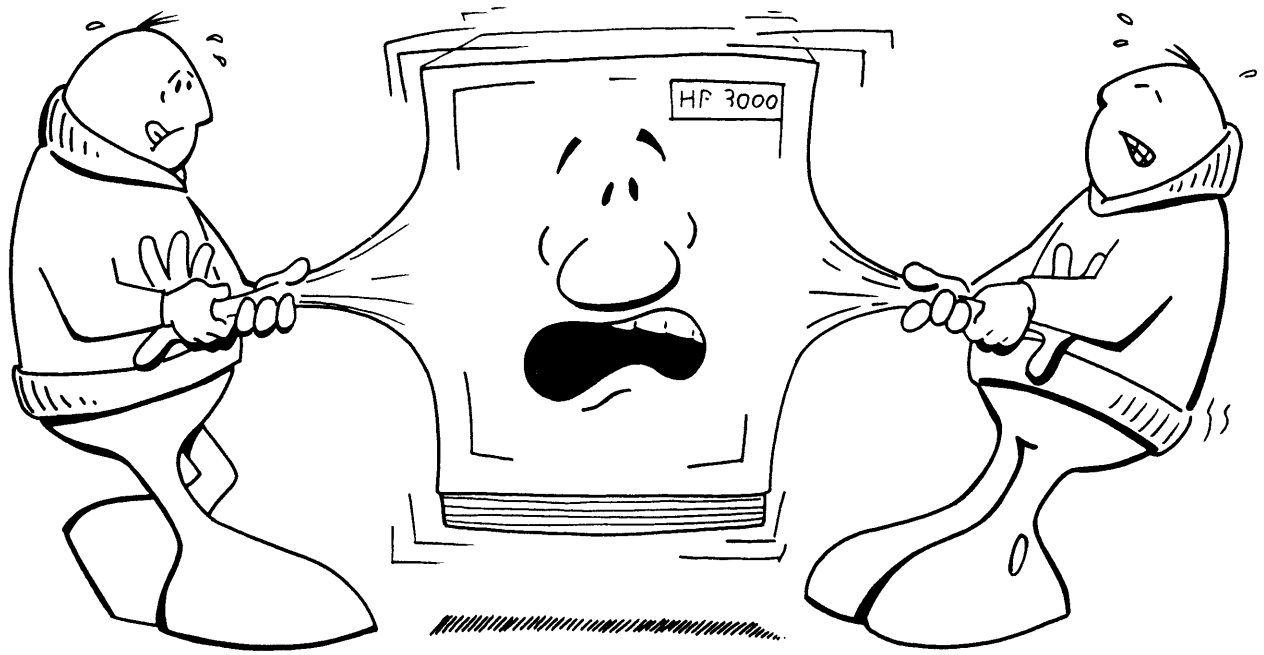
A system shutdown rarely implies turning off power to the computer hardware. Instead, "system shutdown" means stopping the computer's operating system, which is the software that controls computer activity. Stopping all, or almost all, system activity makes the computer inaccessible to users. From their perspective, it's immaterial whether you also turn off the SPU, disc 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 duplicate the information in a procedure known as a "system backup". (System backup is explained in Chapter Eight.) You'll also shutdown the computer to change its "configuration", or how all the pieces fit, and work, together. To do this, you'll probably work with your System Manager.

9 System Shutdown

Give Computer Users Advance Notice

The computer is a tool that people use to do their jobs. If you take it away from them without warning, you're likely to have some aggravated people on your hands.



So, how can you keep the peace?

- Plan a regular shutdown schedule that's convenient for the majority of computer users.
- Let everyone know what it is ahead of time.

Scheduled shutdowns frequently coincide with system backups because users must stop making changes to their files, and stop using the computer, to copy the information to tapes. As you read this chapter, you'll notice that the steps you take to shut down the system are nearly identical to those needed to prepare for a backup.

Including Shutdown Information In The Welcome Message

It's a good idea to include shutdown information in the Welcome message. This way, users know what to expect as soon as they log onto the computer, and can plan their workday accordingly.

Below is an example of an informative Welcome message. It's clear, concise, and lets people know they can call you if the shutdown schedule presents a problem.

```
****************************************
*                                      *
*      Welcome! The system will        *
*      be shutdown at 5 PM today.      *
*      If you have any questions,      *
*      call extension 1234.            *
*                                      *
****************************************
```

You create the Welcome message for your computer and change it as needed. To learn how, read "How To Use The Welcome Message" in Chapter Two.

In addition to the Welcome message, it's important to let everyone know when you're about to begin the shutdown. You'll use two types of messages for this:

- A Tell message, approximately 15 minutes beforehand.
- One or more warnings, a few minutes before shutdown.

Telling Users About The Shutdown

About fifteen minutes before the shutdown, send a Tell message. It reaches almost everyone, and gives them enough time to finish their work and log off.

Type: `TELL @S;Shutdown in 15 minutes.`

and: `Please log off` Return

To find out who didn't get the message,

type: `SHOWJOB JOB=@S` Return

Check the third column of information on your screen. Anyone who's session is described as "QUIET" didn't receive your message. You can't do anything about that: users, and not you, choose whether or not to suppress Tell messages. But, there's a way around it.

Letting Quiet Users Know What's Happening

One way to get the word out is to repeat the Tell message a few minutes later with an extra note, like this:

Type: `TELL @S;Shutdown in 10 minutes.`

and: `Please tell your QUIET neighbors` Return

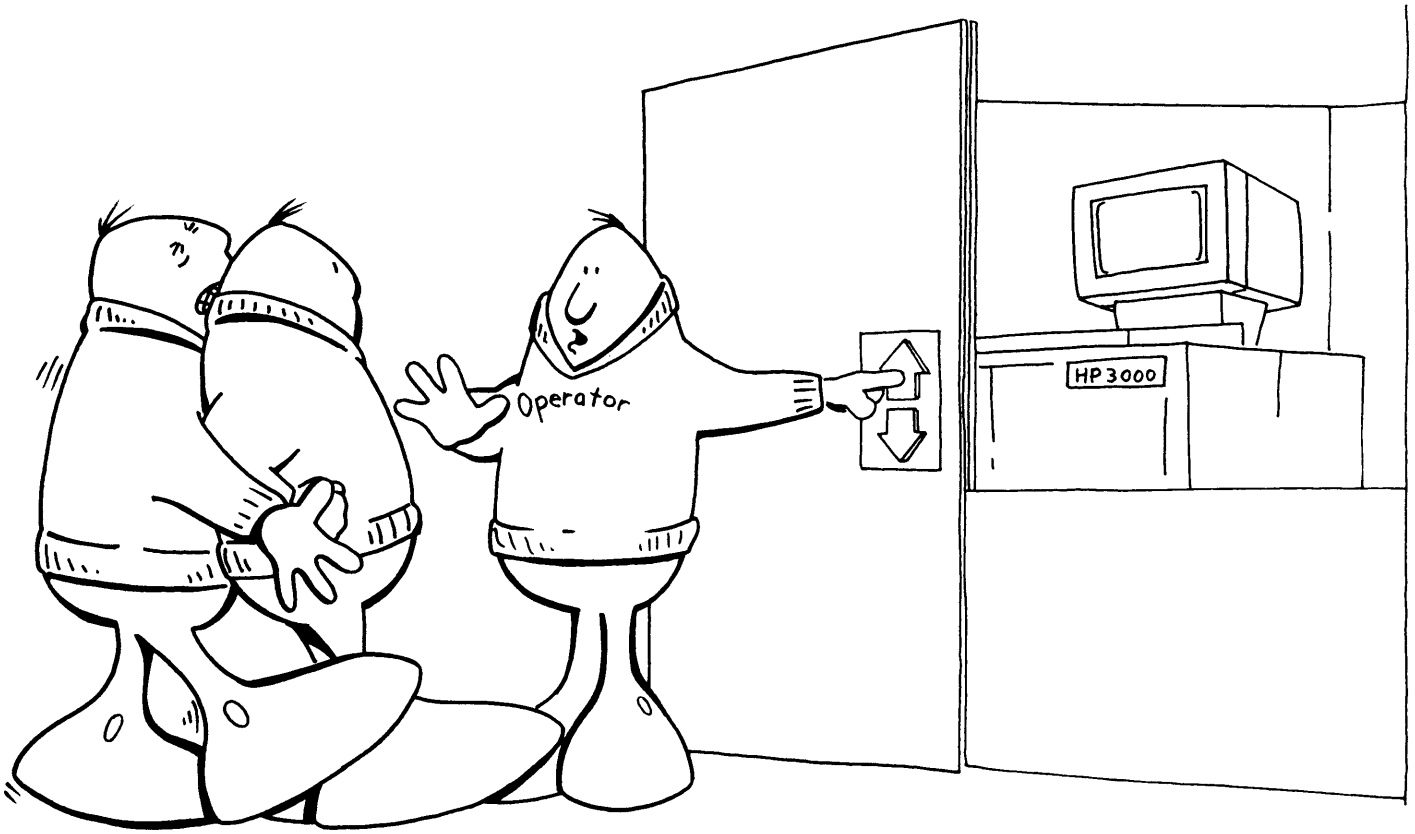
If it isn't convenient for you to contact the quiet users, they'll have to wait for the warning, which you'll send about two minutes before the shutdown. Warnings are displayed on everyone's terminal.

Prevent New System Activity

In addition to asking users to quit using the computer, you also need to make sure nobody starts any new work. About 10 minutes before the shutdown,

type: `LIMIT 0,0` Return

and: `JOBFENCE 14` Return



To check the new jobfence and limits, type: SHOWJOB_STATUS Return

The last line of information on your Console should exactly match the one below. If it doesn't, repeat the JOBFENCE and LIMIT commands.

```
JOBFENCE= 14; JLIMIT= 0; SLIMIT= 0
```

Stop The Printing Process

After you've sent everyone a Tell message and set the jobfence and limits, it's time to check the printers. Since you can't shut down the computer when the printer's busy, preparing your printer(s) for a system shutdown requires two steps:

- Prevent users from sending new reports to the printer(s).
- Decide what to do about any reports that have already been sent to the printer. You may either print them before you shut down the computer, or copy them onto a tape and print them after you restart it.

Step One: Check Printing Activity

Type: SHOWOUT_SP Return

You'll see one of two things: the message "NO SUCH FILE(S)" or a list of every report waiting to be printed. If the list is short or if there are no spool files waiting to be printed at all, you can wait a few minutes before shutting the spool queues. Skip to "The Two Minute Warning" on page 9-11.

If the list is long, you'll want to shut the spool queues soon. This prevents users from sending new reports to the printer, so that those already waiting will have a chance to be printed. To do so, skip to Step Two on page 9-8 now.

LP
OFF
LIMITS

Step Two: Prevent Users From Printing New Reports

When you shut the spool queue, people can't send reports to the printer. This won't affect existing spool files, though. If they're eligible for printing, they'll still be printed.

To check the status of your printer, type: **SHOWDEV nn** Return
(use your printer's LDEV number) ↑

```
LDEV    AVAIL      OWNERSHIP       VOLID           DEN    ASSOCIATION
nn      AVAIL      SPOOLER OUT
          ↑ (your printer is available to everyone)
```

To shut the spool queue, type: **SHUTQ nn** Return
(use your printer's LDEV number) ↑

IMPORTANT

If you're told that SHUTQ is an "UNKNOWN COMMAND NAME", then you must stop the spooler and restart it (with a shut spool queue). Repeat the following series of commands for each printer connected to your computer, substituting the printer's LDEV number for "nn":

Type: **SUSPENDSPOOL nn** Return

and: **STOPSPOOL nn** Return

and: **STARTSPOOL nn;SHUTQ** Return

Check the printer's status now by typing: **SHOWDEV nn** Return
(use your printer's LDEV number) ↑

If you succeeded in shutting the queue, you'll see this:

```
LDEV    AVAIL      OWNERSHIP       VOLID           DEN    ASSOCIATION
nn      UNAVAIL    SPOOLER OUT
↑            ↑ (no new reports can be added to the queue)
(your printer's LDEV number)
```

Step Three: Clear The Backlog Of Existing Reports

Shutting each printer's queue prevents the addition of new reports to the list of those already waiting to be printed. Before you can shut down the computer, though, you should clear this backlog.

To list all spool files, type: **SHOWOUT SP** Return

The printer will continue to print any spool files that are ready, so long as their priority exceeds the outfence. Scan the RANK column to see if any spool files are listed as "D" (for deferred), or look at the summary information, which reports the total number of deferred spool files. If none are deferred, skip to "The Two Minute Warning" on page 9-11.

Step Four: Handle Deferred Reports

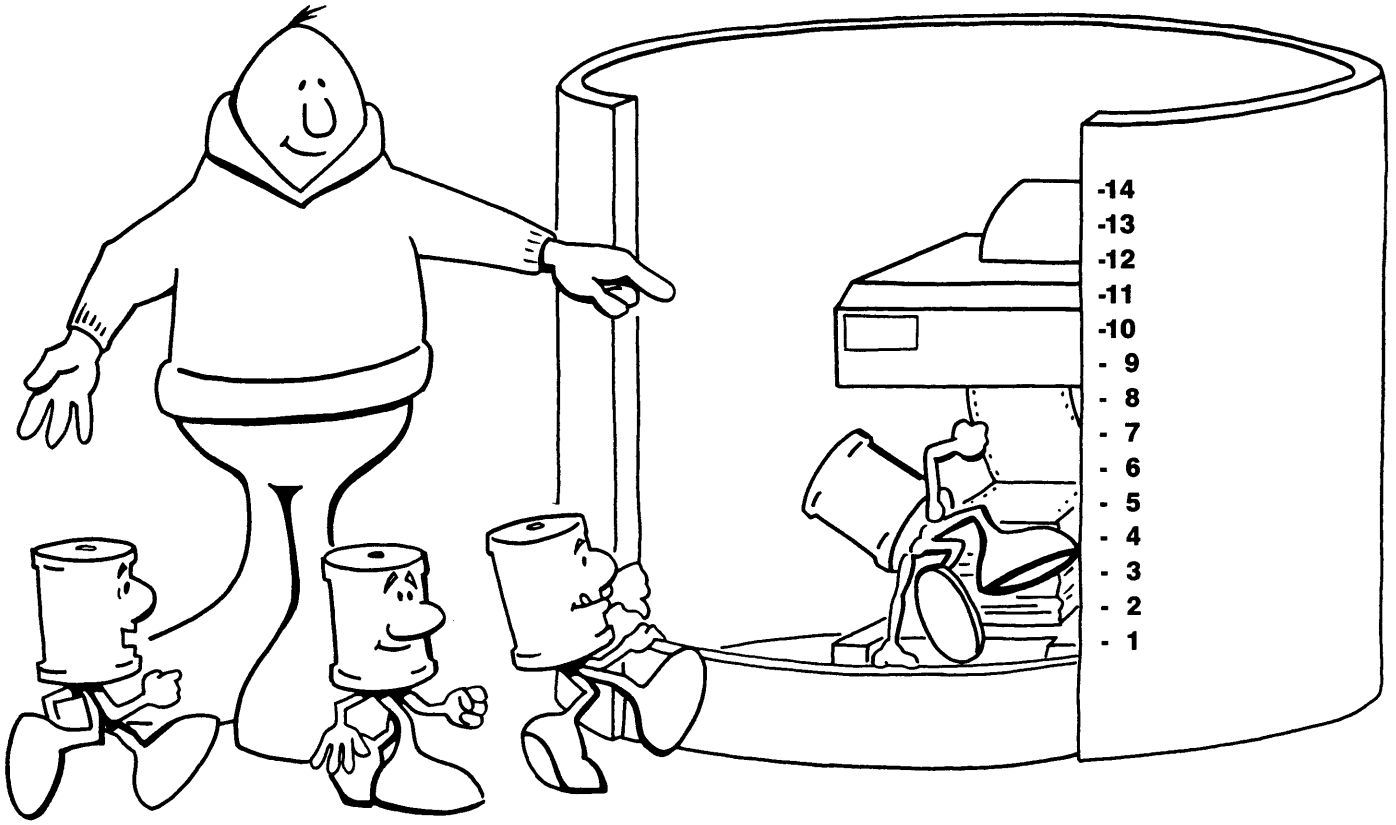
If your list includes some deferred reports, you must choose whether to print them or not. To print deferred reports, lower the outfence and/or raise each report's priority to a number greater than the outfence.

To reset the system outfence to 1, type: **OUTFENCE 1** Return

To reset the outfence for a specific printer,

type: **OUTFENCE 1;LDEV=nn** Return

↑ *(use that printer's LDEV number)*


-14
-13
-12
-11
-10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1

Instead of lowering the outfence, you can raise a report's priority. To do so, use the report's device file ID number in the following command:

Type: ALTSPOOLFILE #nnn;PRI=n Return

(the letter "O", and the DFID number) ↑ ↑ *(a number greater than the outfence)*

Another way to handle spool files before a shutdown is to copy the deferred reports onto a tape. Once you restart the computer, you can transfer the files from the tape back to your computer's disc, where the spooler will select them for printing. For more information, refer to "Creating A SPOOK Tape" in Chapter Four.

Step Five: Check The Printer's Progress

Type: SHOWOUT SP Return

The list of spool files waiting to be printed should be getting shorter. Periodically check the printer's progress until the computer tells you there are "NO SUCH FILE(S)", or until it's a couple of minutes before shutdown.

The Two Minute Warning

A few minutes before you shut down the computer, send everyone a warning and check the following three things:

- Who's still using the computer.
- What jobs, if any, the computer is processing.
- How many reports are still waiting to be printed.

Warn Everyone Of The Shutdown

Type: `WARN @S;SYSTEM SHUTDOWN IN 2`

and: `MINUTES. PLEASE LOG OFF` Return

Remember, press Return only after you've typed in the entire message. Otherwise, people will see only part of it.

Find Out Who's Still Using The Computer

Type: `SHOWJOB JOB=@S` Return
↑ *("all sessions")*

The list of sessions should be very short by now, since users have been told and warned about the shutdown. In fact, everyone except you may have already logged off their terminals. But, if there are still some people using the computer, give them another minute or so to finish up while you take care of the next few details.

Suspend Or Abort Any Jobs

Type: `SHOWJOB JOB=@J` Return
↑ *("all jobs")*

If the computer tells you that there are "NO SUCH JOB(S)", skip to the next section and take care of any remaining spool files. If the computer is keeping track of any jobs, they'll be listed by job number, like this:

```
JOBNUM  STATE IPRI JIN   JLIST    INTRODUCED  JOB NAME

#J9     EXEC        105  LP       TUE  8:22A  MYJOB,OPERATOR.SYS
#J12    EXEC        105  LP       TUE 12:27P  UPDT,MGR.PAYROLL
#J34    EXEC        105  LP       TUE 12:44P  AJOB,USER.ACCOUNT
```

IMPORTANT

Any scheduled jobs will be grouped in a separate list, below the others.

You can handle jobs in one of two ways, depending upon how you plan to restart the computer:

- Suspend them if you're planning to warmstart the computer. The computer keeps track of them, even after the shutdown, so that job processing can be resumed.
- Abort the jobs if you intend to coolstart the computer or start it using a tape. The computer won't keep track of jobs, so you'll need to start them again anyway (using the STREAM command).

IMPORTANT

Under normal circumstances, you'll warmstart the computer. This means that you need only suspend any waiting, executing, or introduced ("INTRO") jobs; the computer will keep track of scheduled jobs for you. If you intend to start the computer another way, you must abort each job. For more information about starting the computer system, refer to Chapter Eight.

Using the job numbers on your screen, type the command below to suspend each job, except those that are already suspended or scheduled jobs.

Type: BREAKJOB #Jnnn Return

↑ *(use your job numbers)*

When you're through, type: SHOWJOB JOB=@S Return

Although the numbers and names on your screen will be different, the jobs you suspended should be listed like this:

```
:SHOWJOB JOB=@S (what you typed)
JOBNUM   STATE IPRI JIN   JLIST    INTRODUCED  JOB NAME

#J9      SUSP        105  LP       TUE  8:22A  MYJOB,OPERATOR.SYS
#J12     SUSP        105  LP       TUE 12:27P  UPDT,MGR.PAYROLL
#J34     SUSP        105  LP       TUE 12:44P  AJOB,USER.ACCOUNT
           ↑ (they're all suspended)
```

To get rid of all jobs, including those that are suspended, waiting, scheduled, or executing, use the ABORTJOB command.

IMPORTANT

Before you abort any scheduled jobs, write down the job name (in the last column) and the date and time it's scheduled to begin. This way, you can correctly reschedule the jobs after you start the computer again.

To abort a job, type: ABORTJOB #Jnnn Return

(use your job numbers) ↑

Did you see this error message?

```
NO PARAMETERS ARE ALLOWED WITH "ABORT".  (CIERR 991)
```

It means you accidentally typed "ABORT" instead of "ABORTJOB". Don't worry, just try the command again.

Each time you abort a job, you can expect to see a job logoff message on the Console, like the one below (though the numbers will be different).

```
17:12/#J13/23/LOGOFF ON LDEV #10
```

After you've aborted all jobs, type: SHOWJOB JOB=@J Return

The computer should tell you that it finds "NO SUCH JOB(S)". If it lists any of the jobs you tried to get rid of, repeat the ABORTJOB command.

Decide What To Do With The Remaining Spool Files

Type: SHOWOUT SP Return

If there are no remaining spool files, or only a few small files left, skip to "The One Minute Warning" on page 9-17.

IMPORTANT

Spool file size is measured in disc sectors, not pages. Check the SPACE column on your screen. Any file using less than 1,000 sectors is, by most standards, considered small.

If there are a lot of spool files, or the few remaining are large (i.e. more than 1000 sectors; check the SPACE column), you can do one of two things:

- If you're planning to warmstart the system, leave the remaining spool files. They'll automatically be printed when you restart the computer. (For more information, read Chapter Eight.) Skip to "The One Minute Warning" on the next page.
- If you're not planning to warmstart the system, or if you're not sure, copy the remaining spool files onto a tape. After you restart the computer, you'll transfer the files from the tape to your computer's disc, where the spooler will select them for printing.

  To copy spool files to a tape, read "Creating A SPOOK Tape" in Chapter Four. Then continue with the shutdown procedure by checking session activity.

In either case, prevent any more reports from being printed by raising the outfence:

Type: `OUTFENCE 14` Return

If any separate outfences are set for individual printers, reset them, too.

Type: `OUTFENCE 14;LDEV=nn` Return

↑ *(use your printer's LDEV number)*

The One Minute Warning

By now, you should have taken care of jobs and spool files, and limited system activity. Also, since you've warned everyone to log off the computer, few people, other than yourself, should be using the computer. If necessary, you have time to issue one more warning before you abort any remaining sessions. You'll also have the time to check for and answer any Console requests.

Check Session Activity Again

Type: SHOWJOB JOB=@S Return

If a few people are still using the computer, send one last warning. Otherwise, skip to the next page to answer any Console requests.

Type: WARN @S;SYSTEM GOING DOWN!

and: LOG OFF Return

Wait a few seconds, then type: SHOWJOB JOB=@S Return

If there are still some sessions listed on the Console, other than yours, a couple of things might be happening:

- The people still using the computer have a lot of work to do, and they're waiting until the last possible minute to finish.
- They're not at their terminals, and haven't received any of your messages or warnings.
- They've already left for the day, and just forgot to log off.

As you read the next section to take care of any Console messages, the last few users should finish up.

Answer Any Console Requests

Hold down CTRL and type: **A**

When the "=" prompt appears, type: **RECALL** Return

If you see the message below, there are no outstanding Console requests. Press Return to get the colon prompt back, then skip to the next page to abort any remaining sessions.

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

If there are any unanswered Console requests, the computer lists them for you, like this:

```
THE FOLLOWING REPLIES ARE PENDING:
?16:50/#26/22/LDEV# FOR "T" ON CTAPE (NUM), WRITE RING? (Y/N)
          ↑ (the PIN)
```

Using the PINs that appear on your screen, individually answer each request. Only this time, instead of typing the LDEV number of the tape drive or printer (which means it's available), respond with a zero (which means it isn't).

For each request, type: **REPLY nn,0** Return
↑ *(the PIN)*

After you have answered each one, type: **RECALL** Return

The computer should now tell you that there are "NO REPLIES PENDING". Press Return to get the colon prompt back, and continue the shutdown procedure by aborting any remaining sessions.

Abort Any Remaining Sessions

Type: SHOWJOB JOB=@S Return

If you have repeated the warning to log off the computer, the only session in the list should be your own. If not, use the session numbers to abort any remaining sessions.

IMPORTANT

DON'T abort your own session. If you do, you won't be able to start a new one unless you're assigned OP capability. (OP capability allows you to log on with high priority, bypassing the session limit and jobfence.)

If you do accidentally abort your own session, and you can log on with high priority,

type: HELLO OPERATOR.SYS;HIPRI Return

Then, continue with the shutdown.

Type: ABORTJOB #Snnn Return

↑ *(use the session numbers on the Console)*

Repeat the ABORTJOB command for each session (other than your own) listed on the Console. As you abort each session, the computer should send a logoff message to the Console like this:

```
17:09/#S81/56/LOGOFF ON LDEV #27
```

Did you see this message?

```
NO PARAMETERS ARE ALLOWED WITH "ABORT".  (CIERR 991)
```

It means you typed "ABORT" instead of "ABORTJOB", an easy mistake to make. Try the command again.

When you're through aborting any sessions, check to make sure that you are the only person still logged onto the computer.

Type: SHOWJOB JOB=@S Return

```
 :SHOWJOB (what you typed)
JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME

#S669   EXEC        20  20       MON  8:22A  OPERATOR.SYS

 1 JOBS (DISPLAYED)
    0 INTRO
    0 WAIT; INCL 0 DEFERRED
    1 EXEC; INCL 1 SESSIONS
    3 SUSP
JOBFENCE= 14; JLIMIT= 0; SLIMIT= 0
```

IMPORTANT

If you are shutting down the computer to do a system backup, STOP HERE. Since everyone except you has logged off the computer and all job processing is suspended, you can safely duplicate any files.

Type The Shutdown Command

If you've done everything else, it's time to issue the SHUTDOWN command:

Hold down [CTRL] and type: **A**

When the "=" prompt appears, type: **SHUTDOWN** [Return]

After a few moments, certain information will be displayed on the Console. The last thing you'll see is a message like the one below, though the numbers on your screen will be different:

```
=SHUTDOWN (what you typed)

 SESSION ABORTED BY SYSTEM MANAGEMENT
 CPU=27. CONNECT= 428. THU, AUG 15, 1985, 5:32 PM
 17:32/#S423/31/LOGOFF ON LDEV #20
```

You may also see the messages "SHUT" or "HALT 15" displayed on the Console.

If, after a minute or so, nothing happens when you type SHUTDOWN, halt the system this way:

Hold down [CTRL] and type: **B**

At the ">" prompt, type: **HALT** [Return]

The logoff message, and other information from the preceding example, should appear on the Console.

Looking Back

1. What three commands enable you, as Operator, to communicate with your users? At what point in the shutdown procedure will you use each?

2. When you are about to shutdown your system, what two commands do you use to prevent new system activity?

3. In what two ways can you handle unprinted reports, and what factors affect your decision?

4. What do you need to know about the shutdown and startup to handle any jobs the computer is processing?

5. How do you check for "pending" Console requests, and what must you do with them?

System Shutdown Quick Reference

To Do:	Do This:
Shutdown the computer:	1. About fifteen minutes before you plan to shutdown the computer: Type: `TELL @S;SYSTEM SHUTDOWN IN 15 ` and: `MINUTES` Return 2. About five minutes later, send another Tell message: Type: `TELL @S;SYSTEM SHUTDOWN IN 10 ` and: `MINUTES PLEASE TELL YOUR QUIET ` and: `NEIGHBORS.` Return 3. Type: `LIMIT 0,0` Return 4. Type: `JOBFENCE 14` Return 5. Check to see how many spool files are waiting to be printed: Type: `SHOWOUT SP` Return If the list is long, prevent users from printing any more reports now: Type: `SHUTQ nn` Return ↑ *(your printer's LDEV number)* If the list is short, skip to the next step. 6. About 2 minutes before the shutdown, send users their first warning: Type: `WARN @S;SHUTDOWN IN 2 MINUTES. ` and: `PLEASE LOG OFF` Return 7. Type: `SHOWJOB` Return 8. If you're going to warmstart the computer, suspend any executing, waiting, or introduced jobs: Type: `BREAKJOB #Jnnn` Return ↑ *(a job number)*

To Do:	Do This:
Shutdown the computer: *(continued)*	9. Or, if you're not going to warmstart the computer, record the jobs that are scheduled (so that you can reschedule them), then abort all jobs: Type: ABORTJOB #Jnnn Return ↑ *(a job number)* 10. Check the list of unprinted reports again: Type: SHOWOUT SP Return 11. If there are still unprinted reports, copy them to a SPOOK tape, following the directions in Chapter Four. 12. Find out who's still using the computer: Type: SHOWJOB Return 13. If necessary, send users another warning: Type: WARN #S;SHUTDOWN IN 1 MINUTE. and: LOG OFF NOW! Return 14. Type: RECALL Return 15. For each Console request, hold down CTRL and type: A At the "=" prompt, type: REPLY nn,0 Return ↑ *(the PIN)* 16. Type: SHOWJOB Return 17. If any users are still logged on, send them another warning: Type: WARN @S;SYSTEM GOING DOWN. and: LOG OFF NOW! Return 18. Abort each session except your own: Type: ABORTJOB #Snnn Return ↑ *(a session number)* 19. Verify that there are no executing jobs, and no sessions but your own: Type: SHOWJOB Return 20. Type the SHUTDOWN command to halt the operating system: Hold down CTRL and type: A Type: SHUTDOWN Return

Introduction To Chapter Ten

This chapter explains system hangs and failures, and tells you how to recover from them. It also teaches you how to troubleshoot a hung terminal and a hung Console.

As the Operator, your key responsibility is to keep the system running at all times. If the computer system hangs or fails, you must react quickly to minimize the loss of time and work. In most cases, you'll want to restart it as soon as possible. Sometimes, though, it's more important to take the extra time to gather information needed to diagnose the failure. This chapter teaches you basic diagnostic procedures. Talk to your System Manager to find out when they're recommended.

Fortunately, system failures occur rarely. Since they do happen, though, it's best to be prepared. This includes:

- Learning some of the early warning signs, such as a hung Console or several hung terminals.
- Keeping an eye on the Console, so that if a failure message does appear, you're there to handle it.
- Knowing how to contact your System Manager quickly. This is one instance in which your System Manager needs to know what's going on—in case you need help, or in case the failure indicates a chronic problem.

The computer system can fail for a number of reasons. Some causes of failure are common to all computers, while other system failures are the result of a unique combination of circumstances that affect few systems. For this reason, a section is included in the back of this chapter to record the system failures you experience, and how to handle them. Work with your System Manager to fill this out; he or she can recommend specific actions to take to get your system up and running quickly.

10 Recovering From System Hangs and Failures

Before You Begin

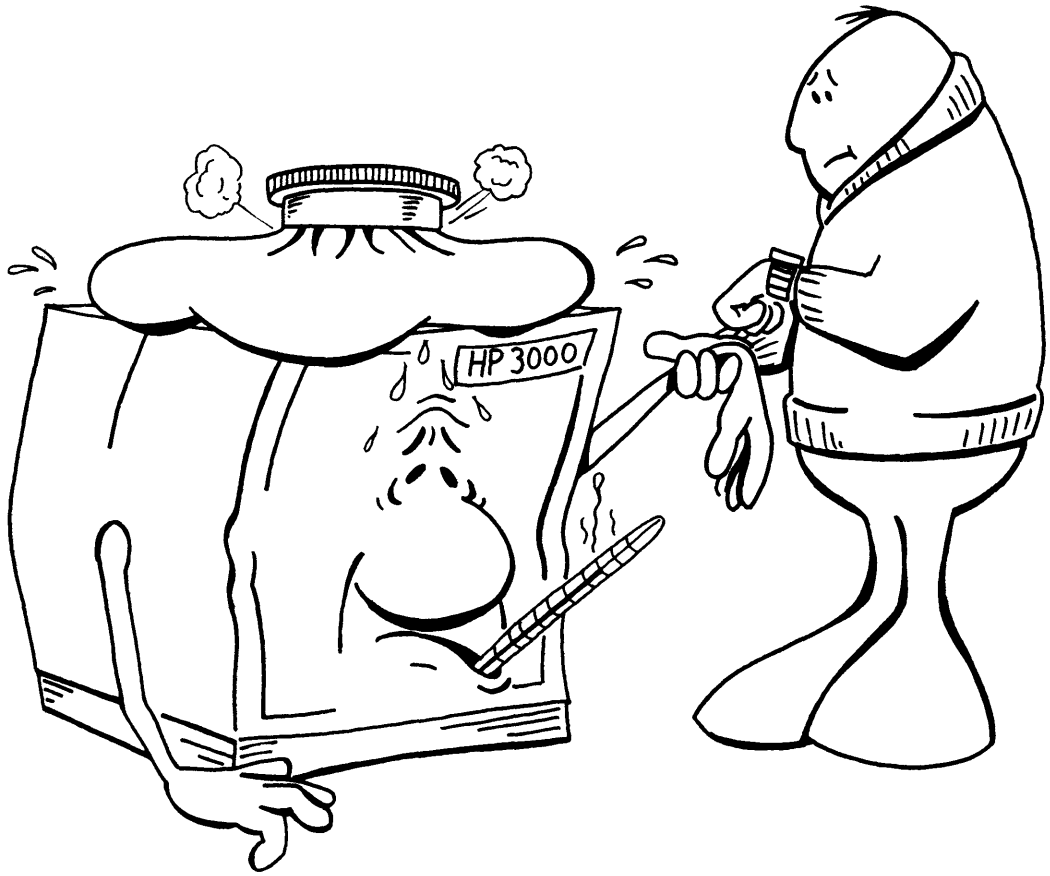
When you run into system problems, you must act quickly. To be effective, you should:

- Know, or be able to find out quickly, the LDEV numbers of the Console, printer(s), and tape drive(s). Refer to "Creating A Complete List Of Computer Devices" in Chapter One.
- Know how to handle cartridge and/or reel tapes and the tape drive(s); refer to Chapters Five and Six.
- Know what version of the operating system you're using; refer to Chapter One, page 1-2.
- Know what capabilities you've been assigned; refer to Chapter One, page 1-2.
- Know which tape drive to use to take a memory dump; it's the one assigned the device class name DDUMP. To check, refer to "Creating A Complete List Of Computer Devices" in Chapter One.
- Know where the tape containing the Software Dump Facility is stored, and make sure you can get to it quickly. You and your System Manager must create the tape while the system is "up" and running.
- Know where to go for help.

If you're reading this Chapter just for information and not because you're dealing with an emergency, now's the time to review this checklist. Later, you'll be glad you did.

Early Warning Signals

Handling a system failure is fairly straightforward. When you see a system failure message on the Console, you must immediately begin recovery procedures. But what if your computer is showing symptoms of illness?



Three of the most common symptoms are:

- Several hung terminals.
- A hung Console.
- Unlit activity lights on the SPU. When the computer system is running, the activity lights will be blinking or lit solidly.

Handling A Hung Terminal

When a terminal is hung, nothing happens when you type on the keyboard.

There are specific steps that you can take to fix a hung terminal. A simple fix only interrupts the user for a few minutes, with little or no work lost. If the terminal doesn't respond to simple troubleshooting, you may have to abort the session. In this case, any work that wasn't saved before the terminal hung will be lost.

IMPORTANT

Several hung terminals frequently indicates that the entire system may hang. A hung system is like a hung, or unresponsive, terminal, only on a much larger scale. When the system hangs, no one can do anything. Before this happens, you might be able to troubleshoot the problem, as this chapter explains. If all else fails, though, you can immediately start the standard shutdown procedure. It allows you some measure of control, and can ultimately save you and your users time and work.

The following steps give you a systematic method for dealing with a hung terminal. Follow them, but don't be afraid to "play around" a bit. The object is to get the terminal working again, whatever that takes.

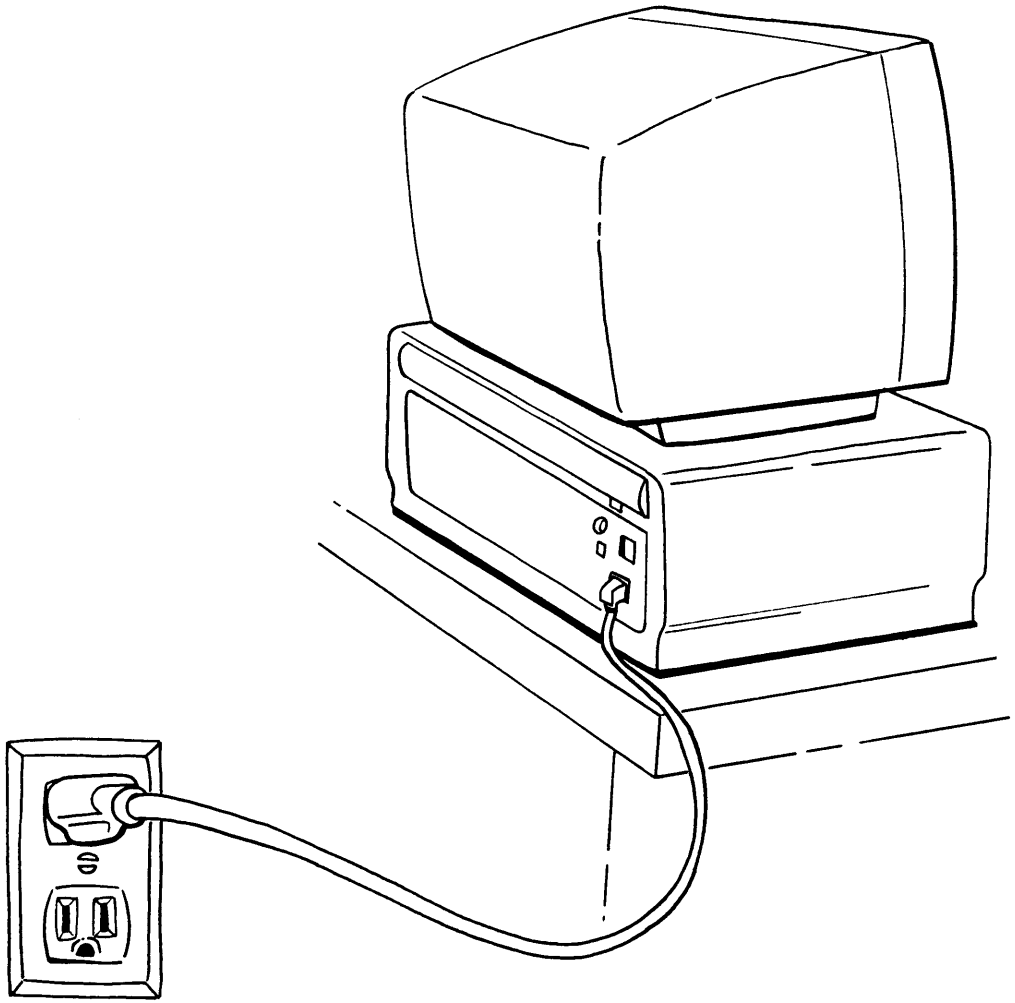
To test whether the terminal is working, press Return several times. You've fixed the problem when you see a column of colon prompts down the left side of the terminal screen:

```
:
:
:
:_
```

Step One: Is The Power On?

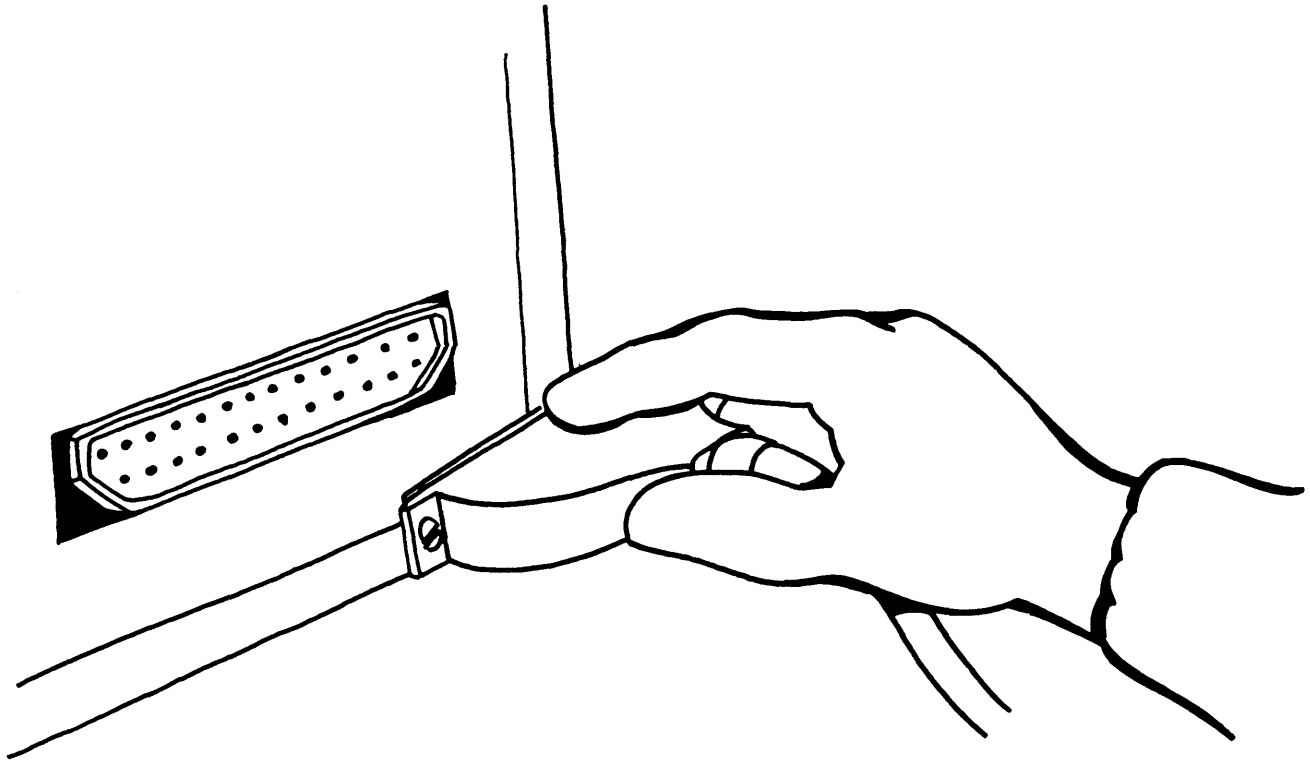
If you see the cursor on the terminal screen, skip these question and go to Step Two. Otherwise:

- Is the terminal on?
- Is it plugged into the power socket?



Step Two: Is The Terminal Still Connected To The Computer?

Terminals are connected to the computer by a length of cable that looks a lot like a standard power cord, except that the "plug" on the ends of the cable is specifically designed for computer equipment. It's called a "serial interface", and it plugs into a socket called a "serial port", like this:



The serial interface must fit snugly into the serial port. Check your terminal to see if it's come loose, or if it's completely disconnected. (If you have trouble reconnecting it, turn it upside down and try again. It only fits one way.)

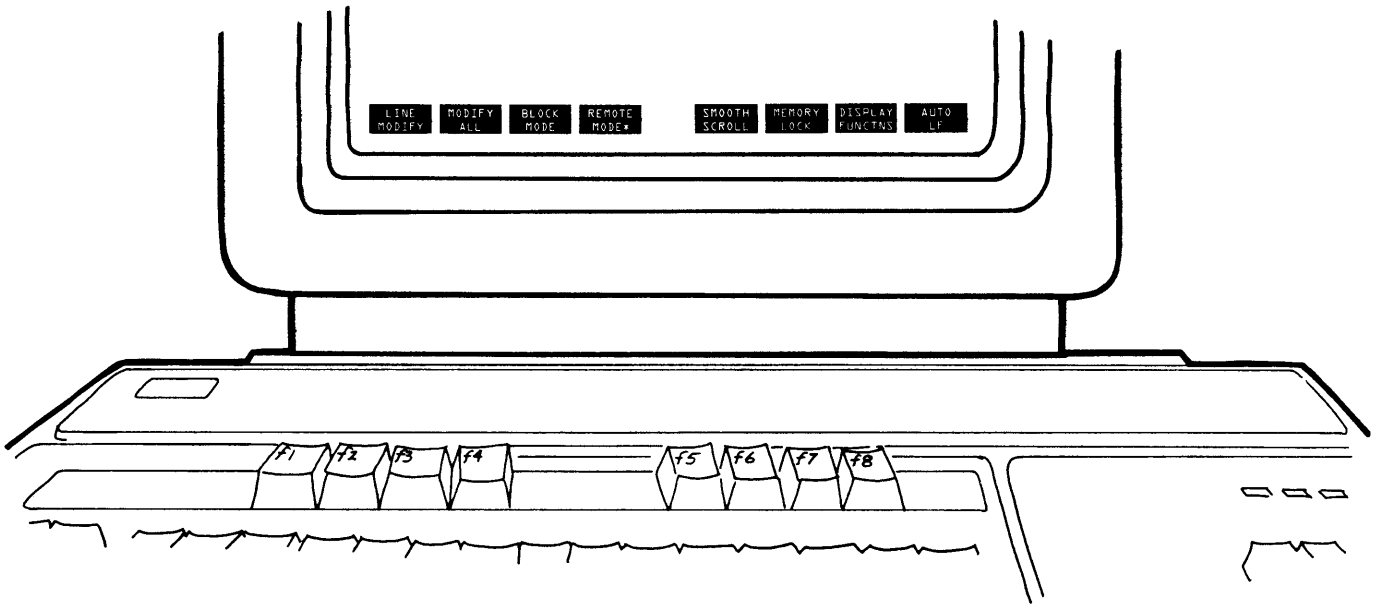
Step Three: Check The Remote Key

You may have a [Remote] key on your terminal keyboard. If so, the terminal will be in remote mode (which is what you want) when the key is either down or up, depending upon what kind of terminal you have. (If you don't see a [Remote] key, then your terminal will have a "Remote Mode" window along the bottom of your screen. Skip to Step Four.)

Press the key so that it's down, then press [Return] a few times. If you don't get any response, press the [Remote] key so that it's up, then press [Return] a few times. Still no luck? Skip to Step Five.

Step Four: Check The Remote Mode Window

If it isn't on your keyboard, the [Remote] "key" will be one of the small windows of information along the bottom of your terminal screen.

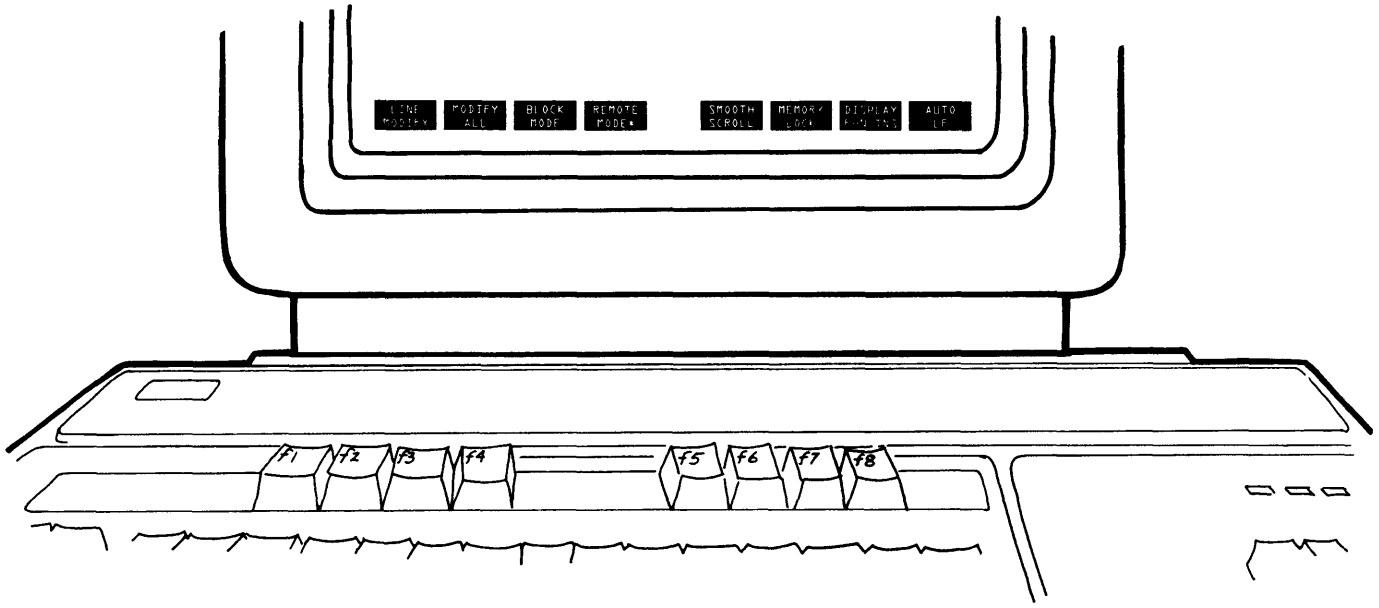


Find the key labelled "f4" on your keyboard and press it until you see an asterisk in the window. Then press [Return] a few times. If you still don't see a colon prompt, go on to Step Five.

<softkeys with function keys corresponding; asterisk in Remote Mode window>

Step Five: Is Auto Linefeed Off?

Like the [Remote] key, the [AUTO LF] key may either be on the keyboard, or displayed as a window along the bottom of your terminal screen. Experiment with it as you did the [Remote] key. If you don't get a colon prompt when you press [Return], go to Step Six.



Step Six: Try To Interrupt

Sometimes, your terminal won't respond because it is already working on something for you. By trying to interrupt what it's doing, you can check to see if it's really hung, or just busy.

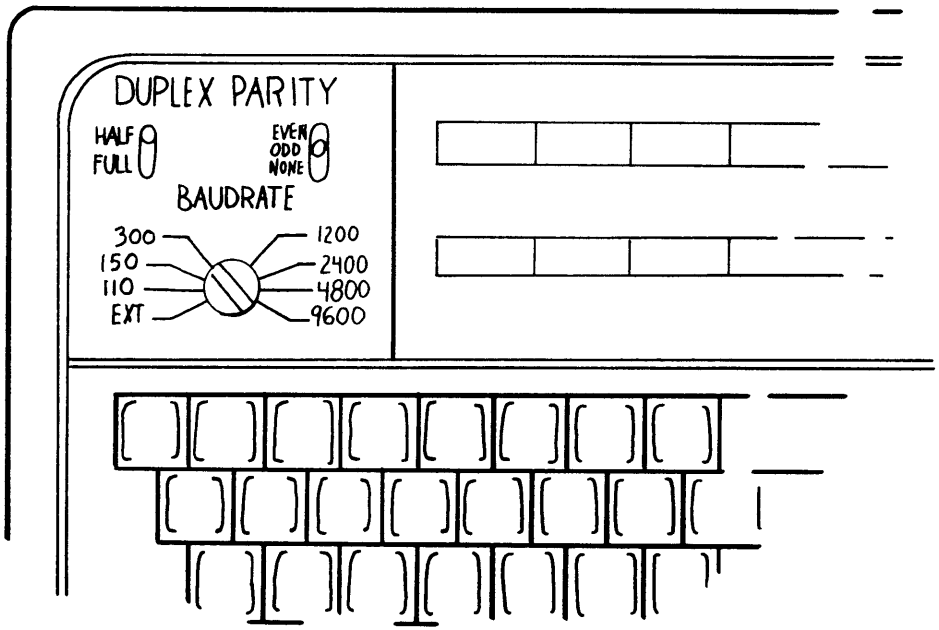
Find the [Break] or [Reset/Break] key on your terminal and press it. If you get a colon prompt, you can do one of two things:

- Tell the computer to continue by typing: RESUME [Return]
  When you see "READ PENDING", press: [Return] again.
- Tell the computer to quit by typing: ABORT [Return]

If you don't get a colon prompt, go on to Step Seven.

Step Seven: Has The Terminal's Speed Been Changed?

Older terminals allow you to manually set the speed, or "baud rate", at which the terminal communicates with the computer. In most cases, the baud rate switch will be in the top left-hand corner of the keyboard, underneath a removeable cover.



In almost all cases, the settings should be:

DUPLEX: "Full"

PARITY: "None"

BAUD RATE: "9600"

If the baud rate is set at something other than 9600,

type: SPEED 9600,9600 Return

The computer will tell you to manually change the speed setting and "input 'MPE' ". Turn the baud rate switch so that it points to "9600".

Type: MPE Return

If you still don't see a colon prompt on the screen, repeat this procedure using a lower speed, 2400 baud:

Type: SPEED 2400,2400 Return

Turn the switch so that it points to "2400".

Type: MPE Return

If you still don't see a colon prompt on the screen, reset the baud rate to 9600 using the directions above, then go on to Step Eight, next.

Step Eight: Try The ABORTIO Command

Occasionally, a terminal hangs when the line of communication between it and the computer gets tied up. If this is the problem, you can issue the ABORTIO command for that specific terminal. (Later, you'll use the ABORTIO command for other peripheral devices as a method to fix a hung Console.) To use this command to free a hung terminal, you need the terminal's LDEV number.

To find the LDEV number:

- Ask the user what it is; or
- Check the LDEV label on the terminal; or
- Type: SHOWJOB JOB=@S Return

  Find the computer identity of the person who's logged onto the hung terminal. Trace across to the number listed in the JIN and JLIST columns; that's the LDEV number of the hung terminal.

Using the LDEV number, type: ABORTIO nn Return

(the hung terminal's LDEV number) ↑

If necessary, repeat the ABORTIO command several times, or until you get this message:

```
NO I/O TO ABORT
```

Press Return several times. If you still don't get a response, try the next step.

Step Nine: Try To Abort The Session

Type: SHOWJOB JOB=@S Return

Use the computer identity of the person logged onto the hung terminal to find their session number. Then, use the session number to abort their session:

Type: ABORTJOB #Snnn Return

↑ *(use the session number that corresponds to the hung terminal)*

If the ABORTJOB command works, a message like the one below is displayed on the user's terminal, though the date and time will be different:

```
SESSION ABORTED BY SYSTEM MANAGEMENT
CPU=13. CONNECT=189.  MON, FEB 21, 1985, 1:09 PM
```

Soon afterwards, you should also see a logoff message on the Console, something like this:

```
13:09/#S42/7/LOGOFF ON LDEV #23
```

Ask the user to press [Return] a few times on their keyboard. If a column of colon prompts appears underneath the "SESSION ABORTED" message, then you've fixed the terminal.

```
SESSION ABORTED BY SYSTEM MANAGEMENT
CPU=13. CONNECT=189.  MON, FEB 21, 1985, 1:09 PM
:
:
:
:_
```

If the session isn't aborted when you type the ABORTJOB command the first time, try it again. Or, try the ABORTIO and ABORTJOB commands alternately. You may be able to solve the problem the second or third time you try them, even if they didn't work the first time. If not, go to Step Ten.

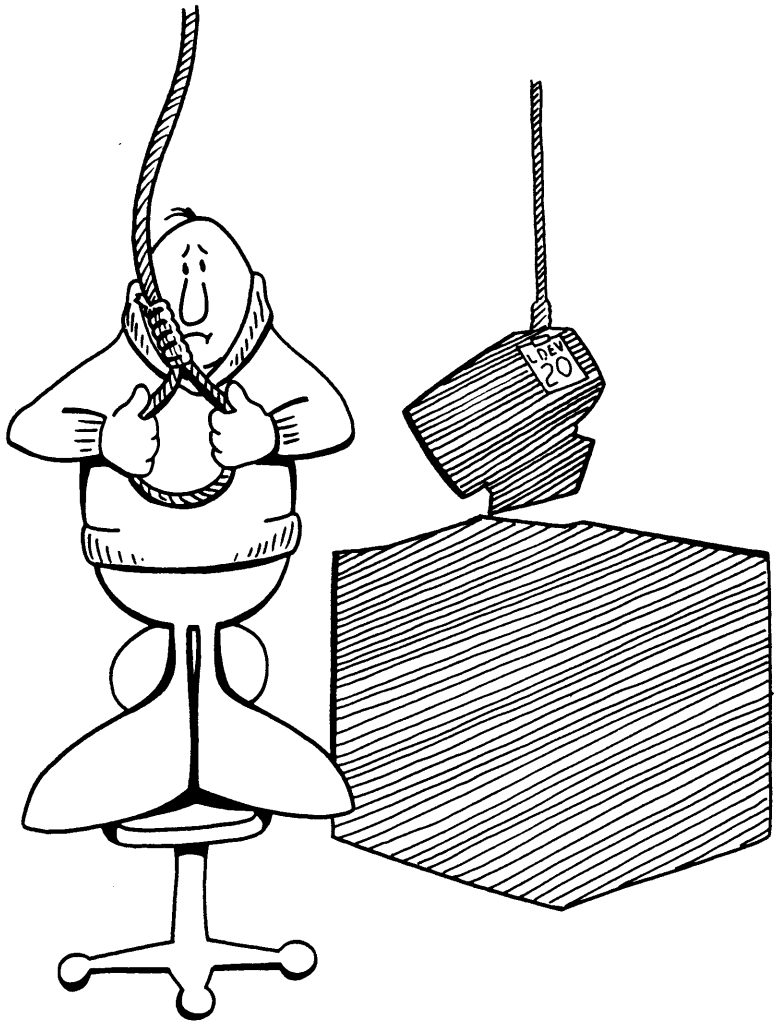
Step Ten: Is The Problem Spreading?

If the hung terminal still won't respond, look around. Are other terminals hung too? If they are, the system may be slowly failing, affecting one terminal at a time.

The first thing to do is immediately check your Console. If you can still get a colon prompt, skip to page 10-27 and read "Attempting An Emergency Shutdown". If not, read about hung Consoles, next.

Handling A Hung Console

As you might imagine, a hung Console is considerably more serious than a hung terminal. Without an "active" Console, you can't monitor or control the system.



Before you cast about for your own noose, remember: you have more options for fixing the Console than you do for fixing other terminals.

First and foremost, treat the Console as a terminal:

- If you don't see anything on the screen, make sure that the Console is turned on and plugged into the power socket.
- If a cursor is visible on the screen, make sure the Console is plugged into the computer.
- Check the [Remote] key or the "Remote Mode" window.
- Check the [AUTO LF] key.
- Try to interrupt the terminal by pressing the [BREAK] or [Reset/Break] key.
- Check the speed (baud rate) setting.

If you don't get any response, continue troubleshooting the problem by following the steps below:

Step One: Try The Control-A Prompt

Hold down [CTRL] and type: **A**

If you don't get the "=" prompt, skip to Step Seven on page 10-20. If you do, ask the computer for a list of unanswered Console requests.

Step Two: Check For Pending Console Requests

At the Control-A prompt, type: **RECALL** [Return]

If there are "NO REPLIES PENDING", skip to Step Three. If there are any unanswered requests, get rid of them one at a time. Clearing the backlog of requests this way frequently fixes the problem since it frees the flow of messages to and from the Console.

To answer a request, you must reference it by the Process Identification Number, or PIN, in the message itself. The PIN always appears after the second slash mark. In the example below, the PIN is 56:

```
?9:12/#S34/56/LDEV# FOR "T" ON TAPE (NUM), WRITE RING? (Y/N)
```

Using the PIN in your Console request, type: R E P L Y _ n n ¬ 0 Return
(the PIN) ↑ ↑ (a zero)

Repeat the REPLY command for each unanswered request. Then check to see that you've taken care of all of them:

Hold down CTRL and type: A

Type: R E C A L L Return

If the computer tells you that there are "NO REPLIES PENDING", press Return a few times. If you still don't get a colon prompt, continue with Step Three.

If you do, then you've fixed the Console. If no other terminals are hung, then the problem's solved. If there are other hung terminals, skip to "Attempting An Emergency Shutdown" on page 10-27.

Step Three: Ask Someone To Send You A Message

Another way to free the flow of messages to and from the Console, and possibly fix the problem, is to ask another user to send you a Tellop message. Check with the others to find out who's terminal is working properly, and ask the user to type the following message:

Type: T E L L Ø P _ I _ h o p e _ t h i s _ w o r k s . Return

Go back to the Console and check for the message. If you see it, press Return a few times. If the Console responds, and there are no other hung terminals, you're done. But if you still can't get a colon prompt on the Console, try the next step.

Step Four: Check The Most Recent Console Messages

Looking back at the messages that were sent to the Console may give you a clue about the problem. In fact, it's very possible that a message sent to or from the Console might be the problem.

IMPORTANT

When you type a command at the Console, it isn't sent to the computer until you press [Return]. Neglecting to press [Return] can hang the Console since Console messages are supressed until the computer receives the command.

First, look at the messages that appear on the screen. Then, scroll the display down to check the messages that have rolled up and off the Console's screen. (To do this, hold down the [SHIFT] and [▼] keys at the same time, or press the [ROLL DOWN] key.) Note any messages that refer to your tape drive and printer. Write down the LDEV numbers that appear in these messages; you'll use them in the next step.

Step Five: Issue An ABORTIO For Any "Suspect" Devices

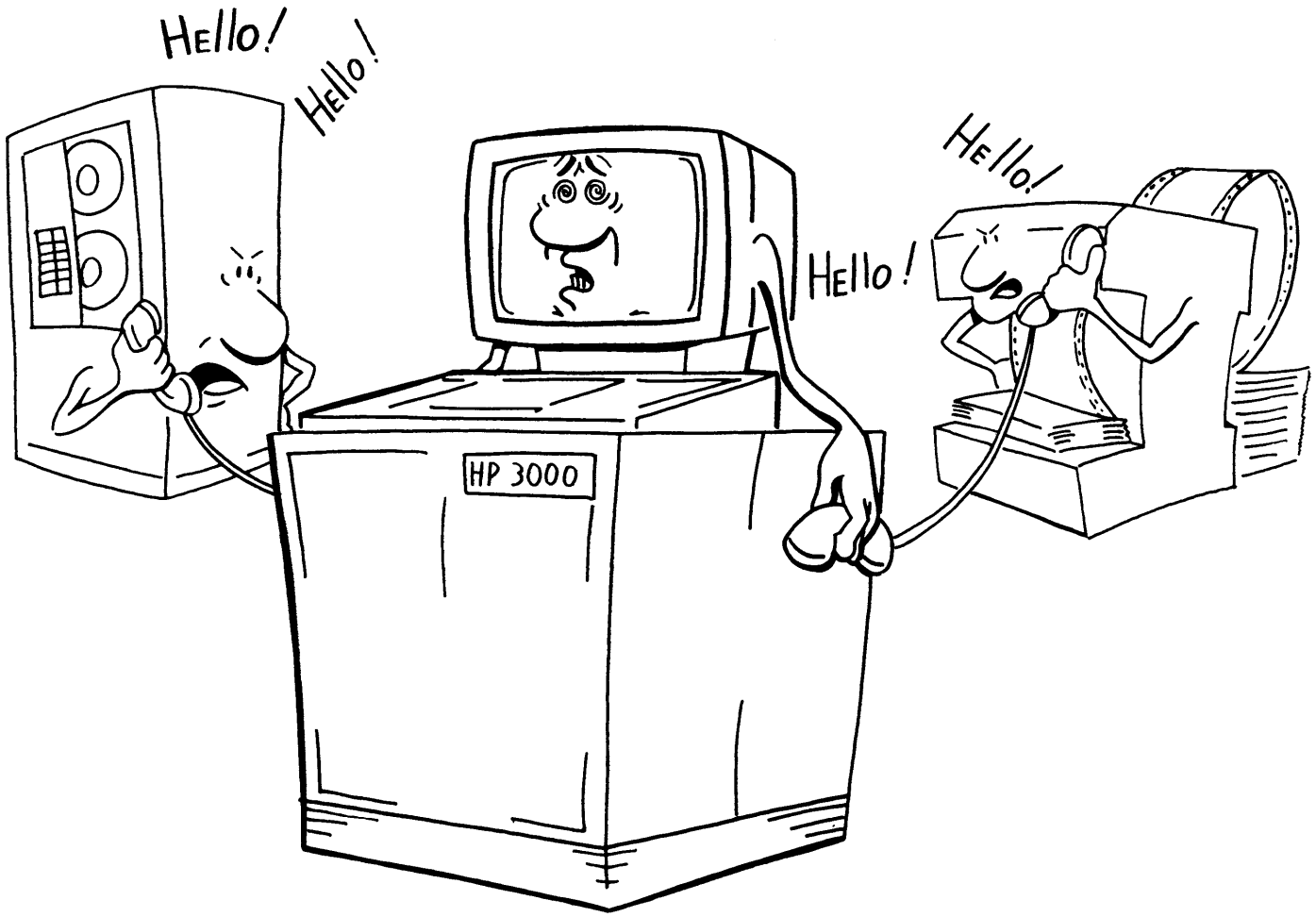
Messages that are passed between the Console and the tape drive, printer, or other device controlled from the Console may also be the source of the problem. If they get hung up, the Console can hang.

If there was one such message that the computer repeated a few times on the Console, it's probably the culprit. Use the LDEV number in the message in the next command:

Hold down [CTRL] and type: A

Type: A B O R T I O _ n n [Return]

↑ *(use the LDEV number in your message)*


Hello!
Hello!
Hello!
Hello!
HP 3000

Repeat the command several times, or until you see the message:

```
NO I/O TO ABORT
```

When this message appears, press Return a few times. If you see a column of colon prompts on the left side of side of your screen, you've fixed the Console. If no other terminals are hung, then the problem's solved. If there are other hung terminals, skip to "Attempting An Emergency Shutdown" on page 10-27.

If you still don't get a colon prompt, look at your Console messages again. Pick an LDEV number from another message, and try again:

Type: **ABORTIO nn** Return

↑ *(use the LDEV number from another message on your Console)*

Repeat the command until you see the message:

```
NO I/O TO ABORT
```

Press Return a few times.

If you see a column of colon prompts on the left side of side of your screen, you've fixed the Console. If no other terminals are hung, then the problem's solved. If there are other hung terminals, skip to "Attempting An Emergency Shutdown" on page 10-27.

If the Console is still hung, systematically type the ABORTIO command for each tape drive and printer connected to your computer. After each attempt, check to see if you can get a colon prompt.

Step Six: Issue An ABORTIO For The Console

Type: ABORTIO 20 Return

Repeat the command a few times until you see the message:

```
NO I/O TO ABORT
```

When this message appears, press Return a few times. If you see a column of colon prompts, the Console is fixed. If not, go on to Step Seven.

IMPORTANT

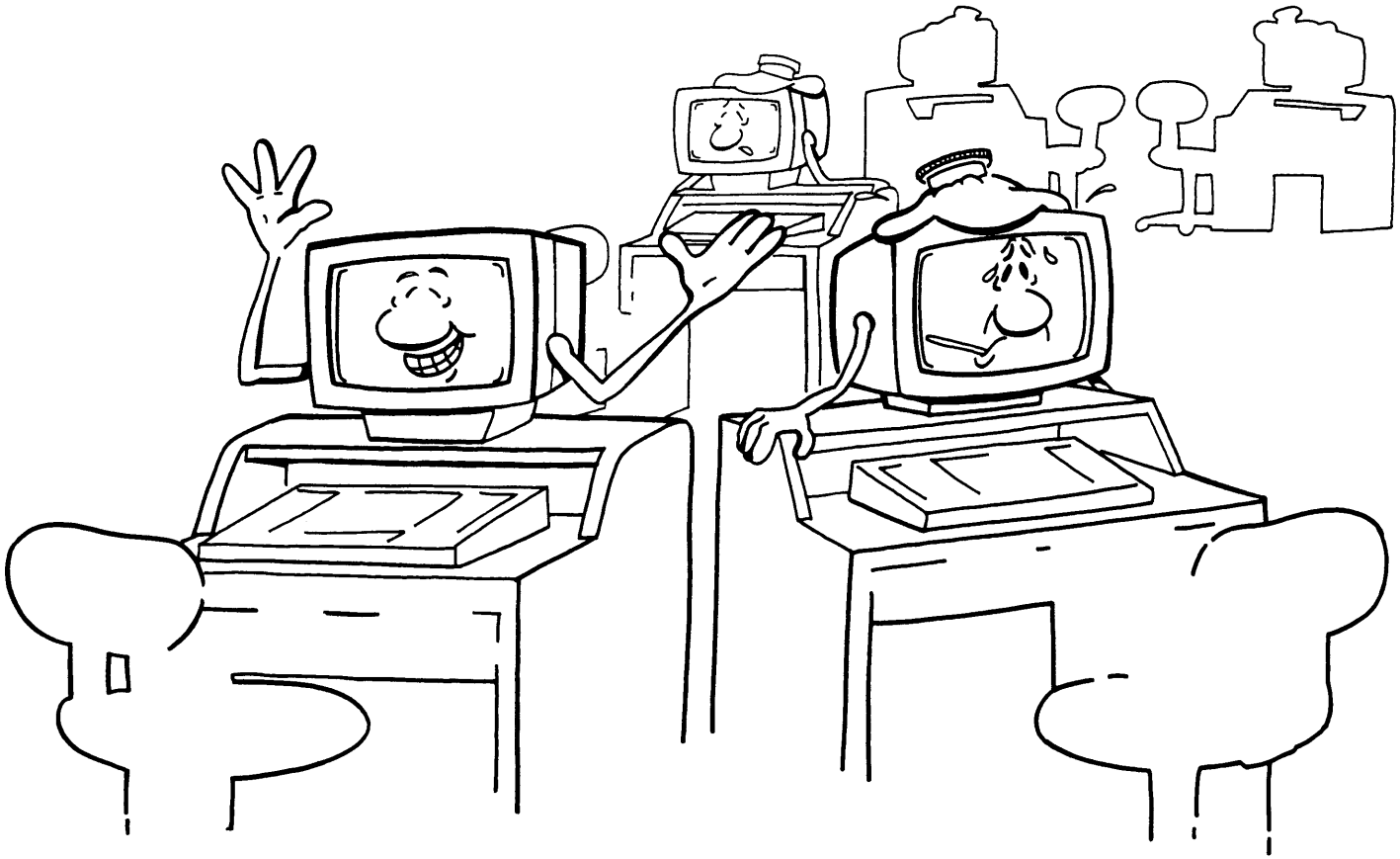
Even if you did fix the Console, it may not have been the only terminal affected. Check with your users. If many of them report hung terminals, you may want to shutdown the computer anyway to get a fresh start. To do so, read about emergency shutdowns on page 10-27.

Step Seven: Move The Console To A Working Terminal

If the Console and all other terminals are hung, then the system is hung. In this case, your only option is to issue the SHUTDOWN command (if you can) and restart the computer. But if there is another working terminal, you can move the Console to it and attempt to abort your own session. (For a thorough explanation of moving the Console, refer to Chapter One.)

To move the Console:

- Find a terminal that's still working properly.
- Ask the person using the terminal to save their work and end the program they're using.
- Press Return to get a colon prompt.
- Log onto the terminal as OPERATOR.SYS.
- Type: CONSOLE Return



The computer responds by telling you the logical device number of the Console terminal. For example:

```
CONSOLE IS ASSIGNED TO LDEV 20.
```

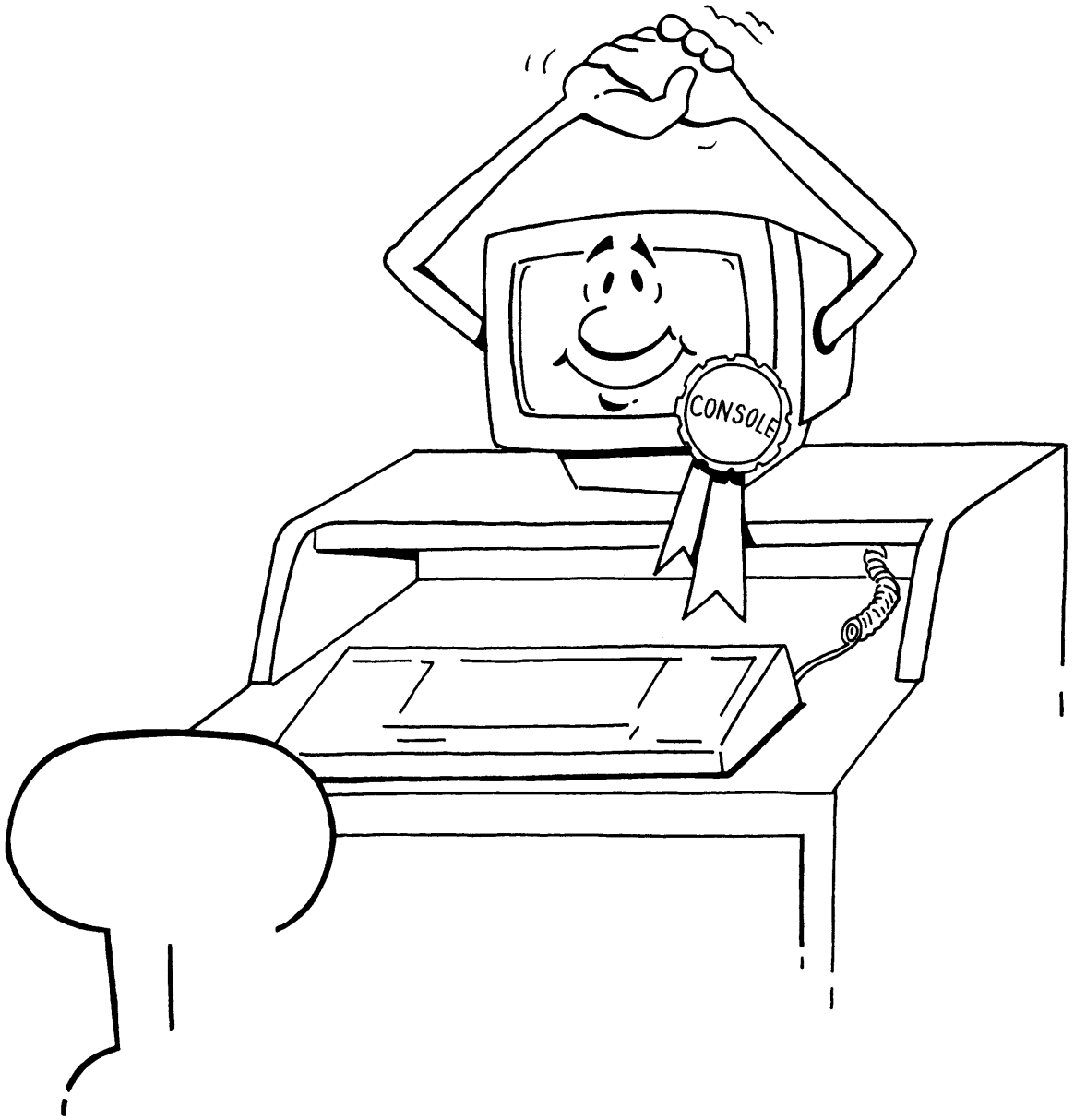
- At the borrowed terminal, type: **SHOWME** Return
- The last line tells you the LDEV number of the borrowed terminal. For example:

```
USER: #S123 OPERATOR.SYS,OPERATOR (IN BREAK)
MPE VERSION: HP32033G.01.00  (BASE G.01.00)
CURRENT: FRI, MAY 3, 1985, 2:26 PM
LOGON:   FRI, MAY 3, 1985, 2:26 PM
CPU SEC:  1        CONNECT MINUTES: 1
$STDIN LDEV: 24      $STDLIST LDEV: 24
             ↑                      ↑
          (the LDEV number of the
          terminal you're borrowing)
```

- Using the number on your screen, type: **CONSOLE nn** Return
  (the LDEV number of the terminal you're using) ↑
- Type: **CONSOLE** Return

Since you just moved the Console to the borrowed terminal, the computer sends you the same message you saw before, but with a different LDEV number:

```
CONSOLE IS ASSIGNED TO LDEV nn.
                            ↑ (the LDEV number of the
                              terminal you're using)
```


CONSOLE

- Type: SHOWJOB JOB=OPERATOR.SYS Return

  You'll see two sessions listed: the session logged onto the Console, and the session you just started on the borrowed terminal.

- Check the first column to find the number of the session logged onto LDEV 20 (the normal location of the Console).

- Use this session number to type the next command at the borrowed terminal (the new Console).

  Hold down CTRL and type: A

  Type: ABORTJOB JOB=#Snnn Return

  ↑ *(use the session number from your screen)*

- If the ABORTJOB command worked, you should get a logoff message on the terminal you're using.

- Go back to LDEV 20 and press Return a few times. If you see a column of colon prompts, you've fixed the problem. Go ahead and try starting a new session:

  Type: HELLO OPERATOR.SYS;HIPRI Return

IMPORTANT

If you get an error message when you try to log on with high priority, then you're probably not assigned OP capability. The computer may still have started your session. To check,

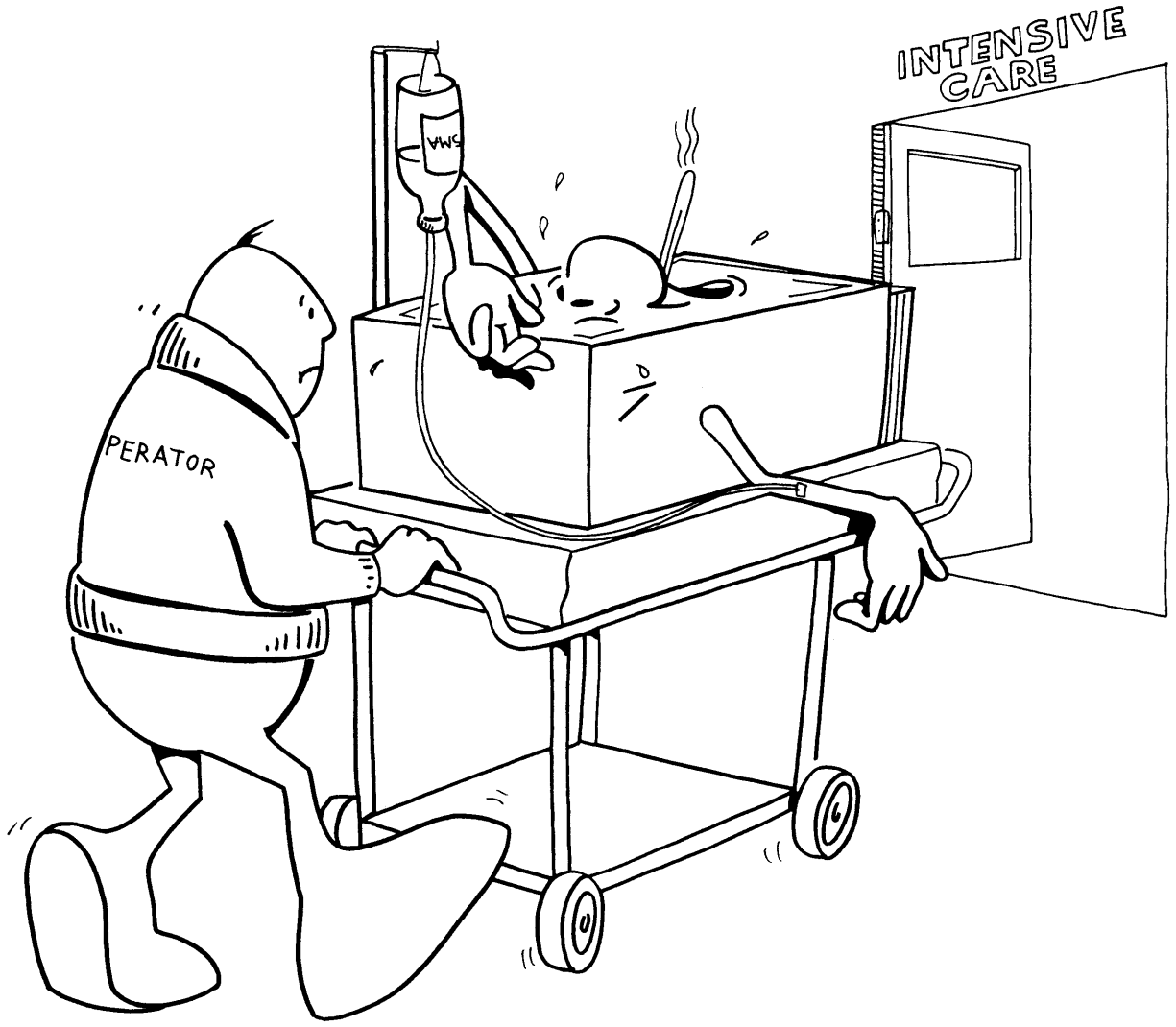
type: SHOWME Return

If you see "EXPECTED HELLO...", contact your System Manager.

- If everything looks okay, move the Console back:

  Type: CONSOLE 20 Return

If moving the Console doesn't work, it's time for more drastic measures.



Step Eight: Force Everyone To Log Off

Your last resort is to force all jobs and sessions to log off, then try and restart your session. Since this affects everyone, find out who's still working on the computer, and ask them in person to save their work and log off.

IMPORTANT

Before you type the next command, make sure you can start a new session afterwards. You can if you're assigned OP capability. To make sure, look at your list of capabilities in Chapter One, on page 1-2. If you didn't write your capabilities down, and you don't know them offhand, skip to the next section, "If The System Is Hung", page 10-31.

Hold down [CTRL] and type: **A**

Type: **LOGOFF** [Return]

This stops all jobs and sessions, including your session at the Console, and prevents anyone from logging back on. It may also be just the "kick" the computer needed to fix itself. To check, press [Return] a few times. If you don't get any response, read "If The System Is Hung", on page 10-31. If you do see a column of colon prompts,

Hold down [CTRL] and type: **A**

Type: **LOGON** [Return]

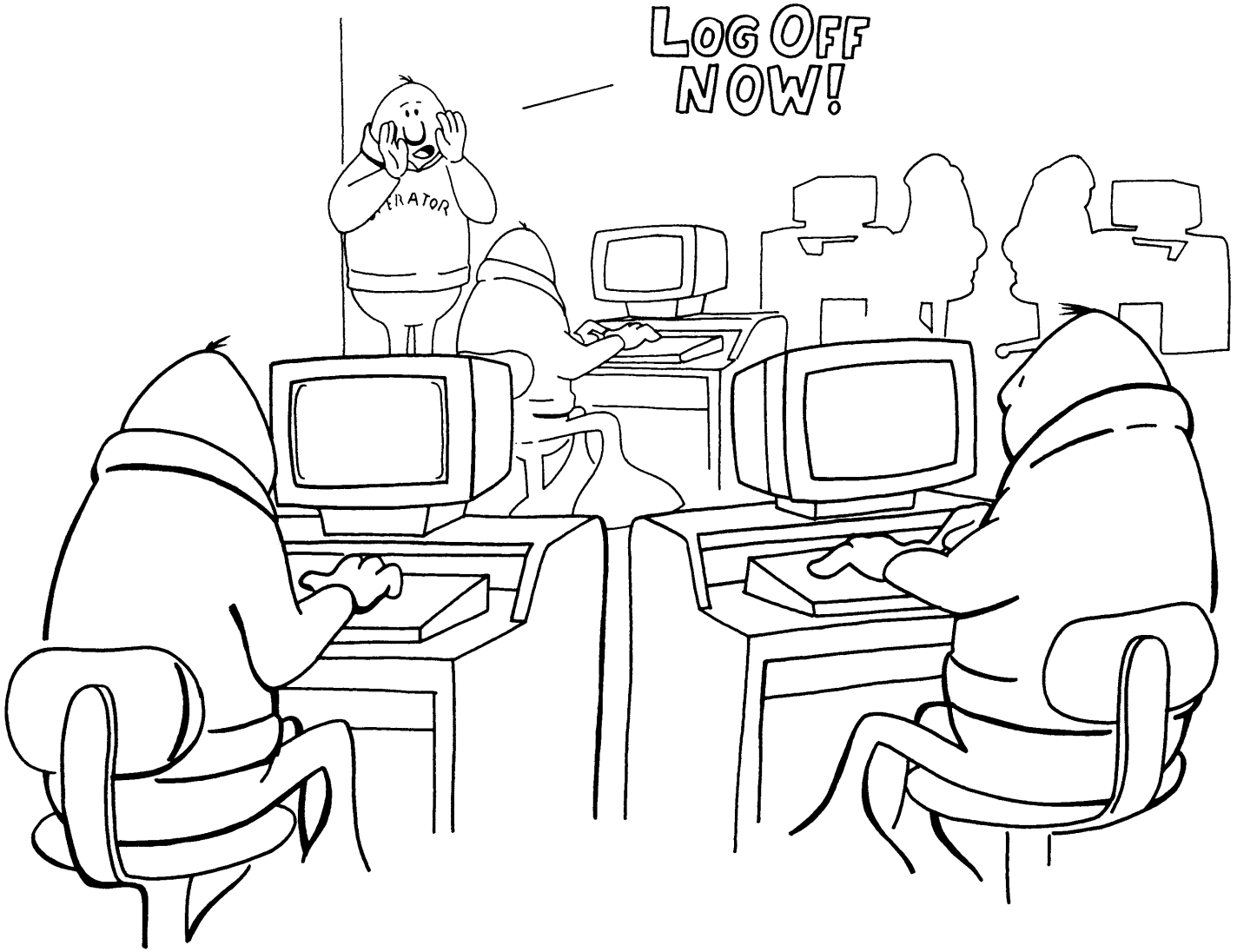
Then restart your session:

Type: **HELLO OPERATOR.SYS** [Return]

If you can log back onto the computer successfully, ask others to try starting a new session at their terminals. If they can, and everything appears to be okay, great. If one or more people report hung terminals, shut down the computer using the directions on the next page.

Attempting An Emergency Shutdown

At this point, your goal is to get everyone to save their files and immediately log off the computer. The steps below are, therefore, a brief version of the full shutdown procedure explained in Chapter Nine.



Step One: Get The Word Out

Press Return a few times. If the Console is still working, warn everyone that there's a problem with the system, and tell them to log off.

Type: `WARN @S:SYSTEM GOING DOWN`

and: `PLEASE LOG OFF IMMEDIATELY.` Return

If you can't get any response at the Console, pass the word in person: someone still may be able to save their files before the system hangs.

Step Two: Check The Hung Terminals Again

Once everyone has logged off, ask users to check their terminals. If there's still no response when they press Return, skip to Step Three. If the terminals are okay, you probably don't need to shut down the system. (Sometimes, the computer slowly comes back to life simply if enough people quit using it.) If this is the case,

- Record the circumstances of the system hang in your log book or at the back of this chapter. If feasible, find out what everyone was doing and which programs they were using at the time of the hang.
- Tell your System Manager exactly what happened. This kind of problem should be diagnosed and corrected with some of the tools available to "tune" the system's performance.
- Allow only a few people to log back onto the computer.

  Type: `SHOWJOB STATUS` Return

  The last line of information on your Console will tell you the job and session limit. Reduce the limits by half.

  Type: `LIMIT nn,nn` Return

  (half the current job limit) ↑ ↑ *(half the current session limit)*
- Watch the system carefully for the next several minutes. If everything looks okay, slowly raise these limits until they reach their normal level. Continue to watch the system closely for the next half hour or so to make sure that everything is operating smoothly.

Step Three: Limit System Activity

If everyone's logged off and there's still no response from their terminals, restrict job, session, and printing activity:

Type: `LIMIT 0,0` Return

Type: `JOBFENCE 14` Return

To check the new values, type: `SHOWJOB STATUS` Return

Type: `OUTFENCE 14` Return

To check it, type: `SHOWOUT STATUS` Return

For each printer, type: `SHUTQ nn` Return
↑ *(the printer's LDEV number)*

IMPORTANT

If the computer tells you that SHUTQ is an "UNKNOWN COMMAND NAME", stop the spooling process for each printer by substituting its LDEV number for "nn" in the next two commands.

Type: `SUSPENDSPOOL nn` Return

and: `STOPSPOOL nn` Return

Repeat these commands for each printer connected to your computer.

To check the printer, type: `SHOWDEV nn` Return
↑ *(your printer's LDEV number)*

Step Four: Suspend Any Executing Jobs

Type: SHOWJOB JOB=@J Return

If your computer tells you that there are "NO SUCH JOBS", skip to Step Five. If there are any executing, waiting, or introduced jobs in the list, suspend them one at a time using the job numbers that appear in the first column.

Type: BREAKJOB #Jnnn Return
↑ (use job numbers from your list)

To check that they're all suspended, type: SHOWJOB JOB=@J Return

Each job, except those scheduled to begin later ("SCHED"), should now be described as suspended, or "SUSP".

Step Five: Get Rid Of Any Console Requests

Hold down CTRL and type: A

At the "=" prompt, type: RECALL Return

If you see the message below, skip to Step Six:

```
NO REPLIES PENDING
```

If any Console requests are still pending, you need to get rid of them before you shut down the computer.

To get rid of request, type: REPLY nn,0 Return
(the PIN) ↑ ↑ (a zero)

Repeat the REPLY command to get rid of each message. When you're finished, check to make sure you've taken care of all of them:

Type: RECALL Return

If there are no more requests you'll see this:

```
NO REPLIES PENDING.
```

Step Six: Type The Shutdown Command

Hold down CTRL and type: A

At the "=" prompt, type: SHUTDOWN Return

The computer will send you a series of messages, including one that tells you your own session has been aborted, and a logoff message for your session on the Console. The messages usually end with "SHUT" or something similar to let you know that system activity has stopped. To restart the computer, read "Recovering From An Emergency Shutdown, Failure, Or Power Fail" on page 10-42.

If The System Is Hung

If you can't get a response from any terminals or the Console, the system is hung. You may, however, still be able to shutdown the computer. It depends on the state of the Console:

Option #1: If Control-A Works

At the Console, hold down CTRL and type: A

If you don't see the Control-A prompt, skip to "Option #2: If Control-B Works", below.

If you see the Control-A prompt, type: SHUTDOWN Return

Wait a few seconds. If the computer sends you a series of messages, including one that tells you your own session has been aborted, and a logoff message for your session on the Console, then the SHUTDOWN command worked. The last message you'll see will be "SHUT" or something similar to let you know that system activity has stopped. Skip to "Recovering From An Emergency Shutdown, Failure, Or Power Fail" on page 10-42.

If, after a few seconds, no messages appear on the Console, try your next option:

Option #2: If Control-B Works

Hold down CTRL and type: B

Look for the Control-B prompt, ">". (Ignore any letter or words that precede the arrow; they vary from system to system.) If you don't see it, skip to "Option #3: When You Can't Get Any Prompt", on the next page.

If you see the Control-B prompt, type: HALT Return

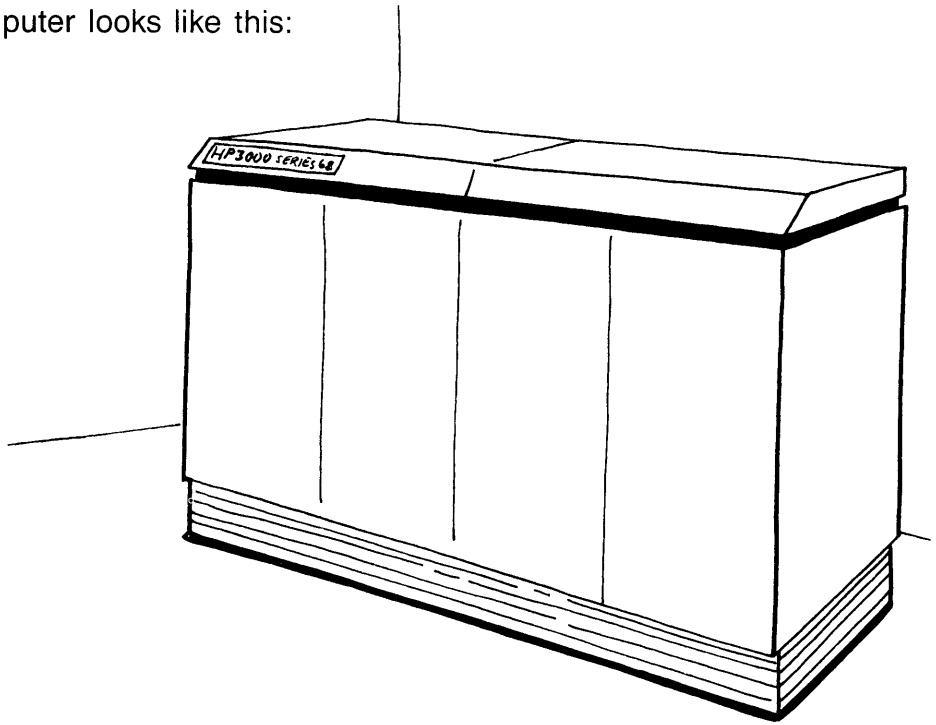
Wait a few seconds. The Console should send you a few messages telling you that your session has been aborted and all others logged off. The last message you'll see should be "HALT 15".

Option #3: When You Can't Get Any Prompt

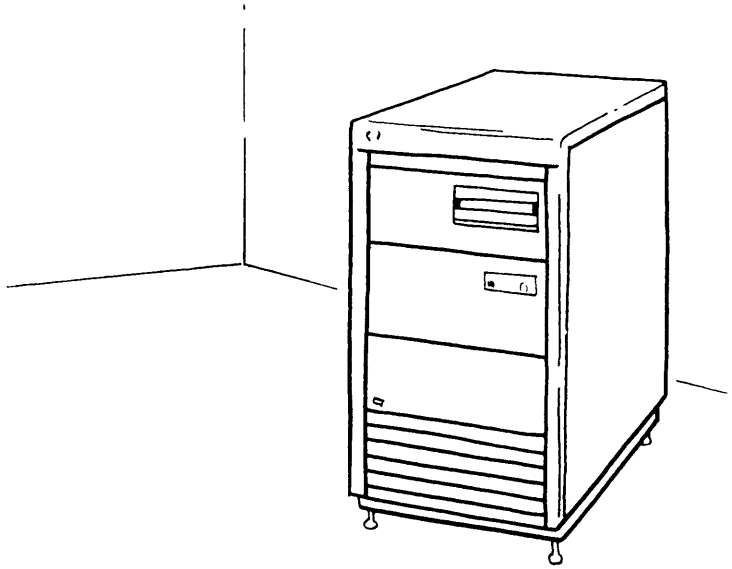
Although it occurs vary rarely, you may not be able to get either a Control-A prompt or a Control-B prompt. If this happens, your only option is to manually halt the system or unplug it to simulate a power-fail shutdown.

If you're using a Series 37, Series 64, or Series 68 computer, pictured on the next page, your only option now is to simulate a power-fail shutdown. Skip to page 10-35 for instructions.

A Series 64 or 68 computer looks like this:

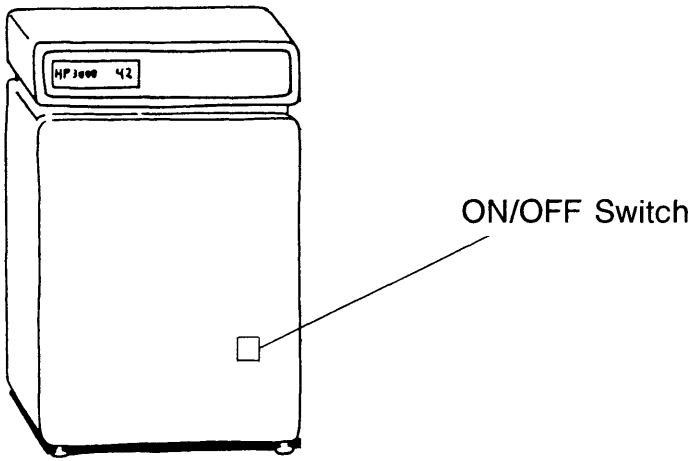


A Series 37 computer looks like this:

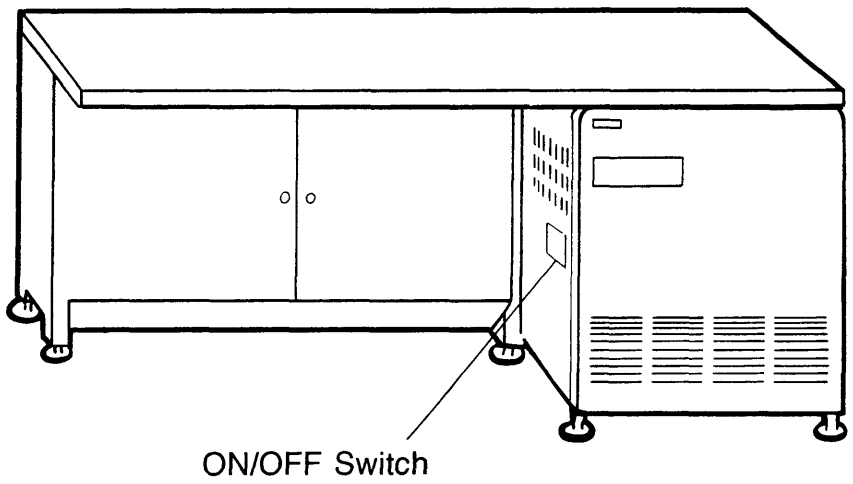


These models of the HP 3000 computer come equipped with an ON/OFF switch, which allows you to turn the power to the SPU off without literally "pulling the plug."

- The Series 39, Series 40, and Series 42. The ON/OFF switch is on the front of the computer.



- The Series 44 and Series 48. The ON/OFF switch is on the right side panel of the computer.



Turn the SPU off, then check the Console. You may have to wait a few seconds, but then you should see a few messages telling you that your session has been aborted and all others logged off. The last message you'll see should be "HALT 15".

If pressing the ON/OFF switch doesn't work, your next step is to simulate a power-fail shutdown.

Simulating A Power Fail Shutdown

If your computer doesn't have an ON/OFF switch on the SPU, or if turning it off didn't work, your only option is to cause a power failure.

IMPORTANT

If you're not sure where or how your computer is plugged in, call your System Manager before trying to turn off the power. If he or she isn't available, or you're on your own, call your Hewlett-Packard service representative.

To do this, unplug the computer for a moment, then plug it back in. You'll see a message like this on your Console:

```
POWER FAIL XXXX
```

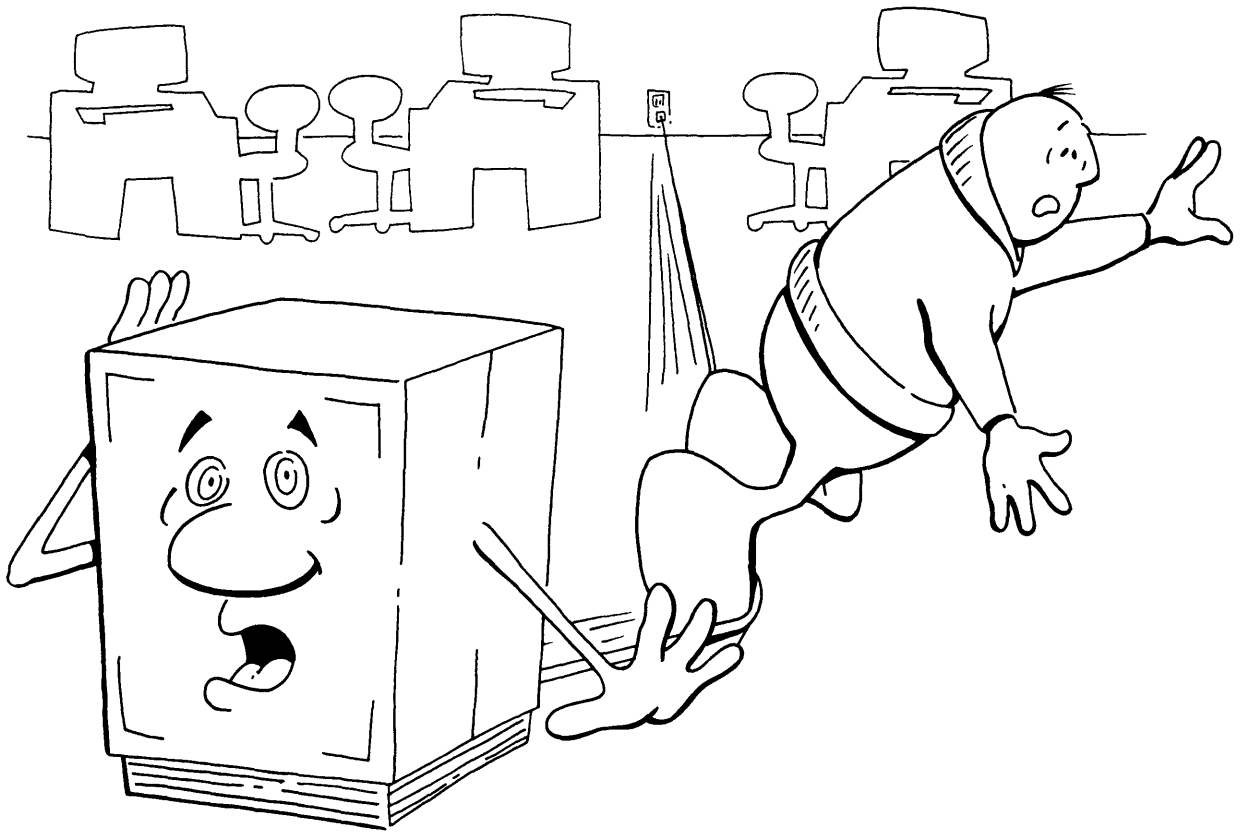
At this point, you can begin recovery procedures. To do so, read "Recovering From An Emergency Shutdown, Failure, Or Power Fail" on page 10-42.

Power Failure

Computers are very sensitive to changes in electrical current. If the power in your building goes out, even for a moment, it may cause a power fail on the computer. This may happen so quickly that the only thing you'll notice is the message:

```
****RECOVERY FROM POWER FAIL****
```

Usually, the computer automatically recovers from momentary power failures. If it doesn't, read about "System Failure", next.



System Failure

Compared to a system hang, there's nothing mysterious about a system failure (except, perhaps, what caused it to begin with). When the system does fail, remember three things:

- Don't panic. All is NOT lost.
- Immediately record the information stored in the computer's memory using the special program provided for this purpose. The program is called the Software Dump Facility, or SDF. You'll be told how to use it in Step Three, on the next page.
- Record what happened and what you did to restart the system. Your System Manager or Hewlett-Packard Support representative can use this information to analyze the problem and prevent it from happening in the future.

Step One: Record The System Failure Message

When the system fails, a message similar to the one below will appear on the Console:

```
****SYSTEM FAILURE #nnnn
    STATUS...          ↑ (the system failure number)
    DELTA....
```

The system failure number doesn't tell you much, especially if you are a new System Operator, or you've never seen a particular number before. But since it's a clue that can explain the cause of the failure, record it in your log book. (If you don't have a log book, create one using the pages at the back of this Chapter as a guide for page layouts and headings.)

IMPORTANT

If you want more information, look up the failure number in Section IX of the System Operation and Resource Management Reference Manual (Part Number 32033-90005). It describes the MPE message system, and will tell you a little more about the failure.

Step Two: Inform Your System Manager

Your System Manager needs to know when the system fails, particularly if it fails frequently or if the same type of failure recurs. Your System Manager may recommend a recovery procedure other than the one explained below.

IMPORTANT

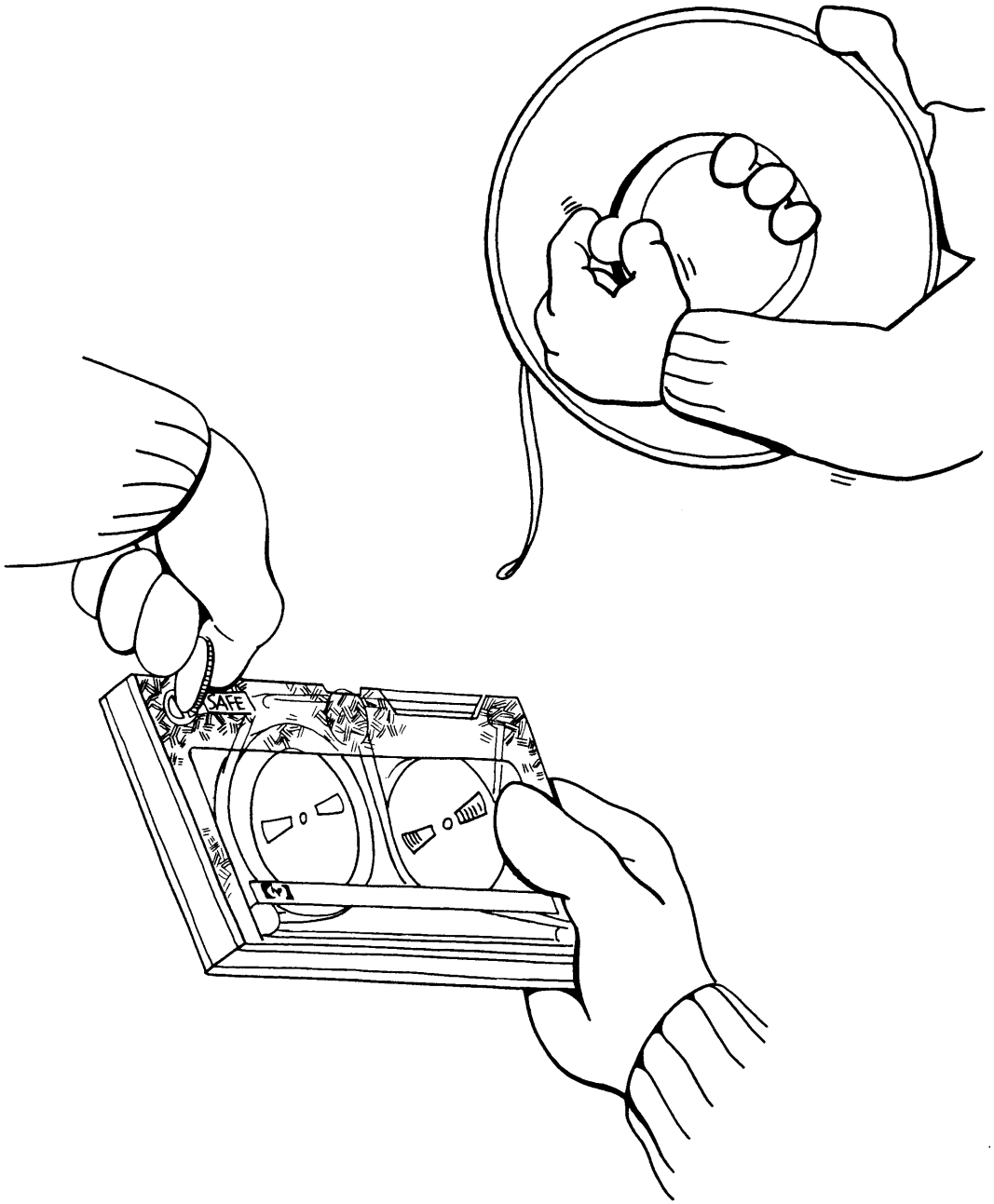
If time is short, you may want to record what happened and what you did after you have restarted the computer.

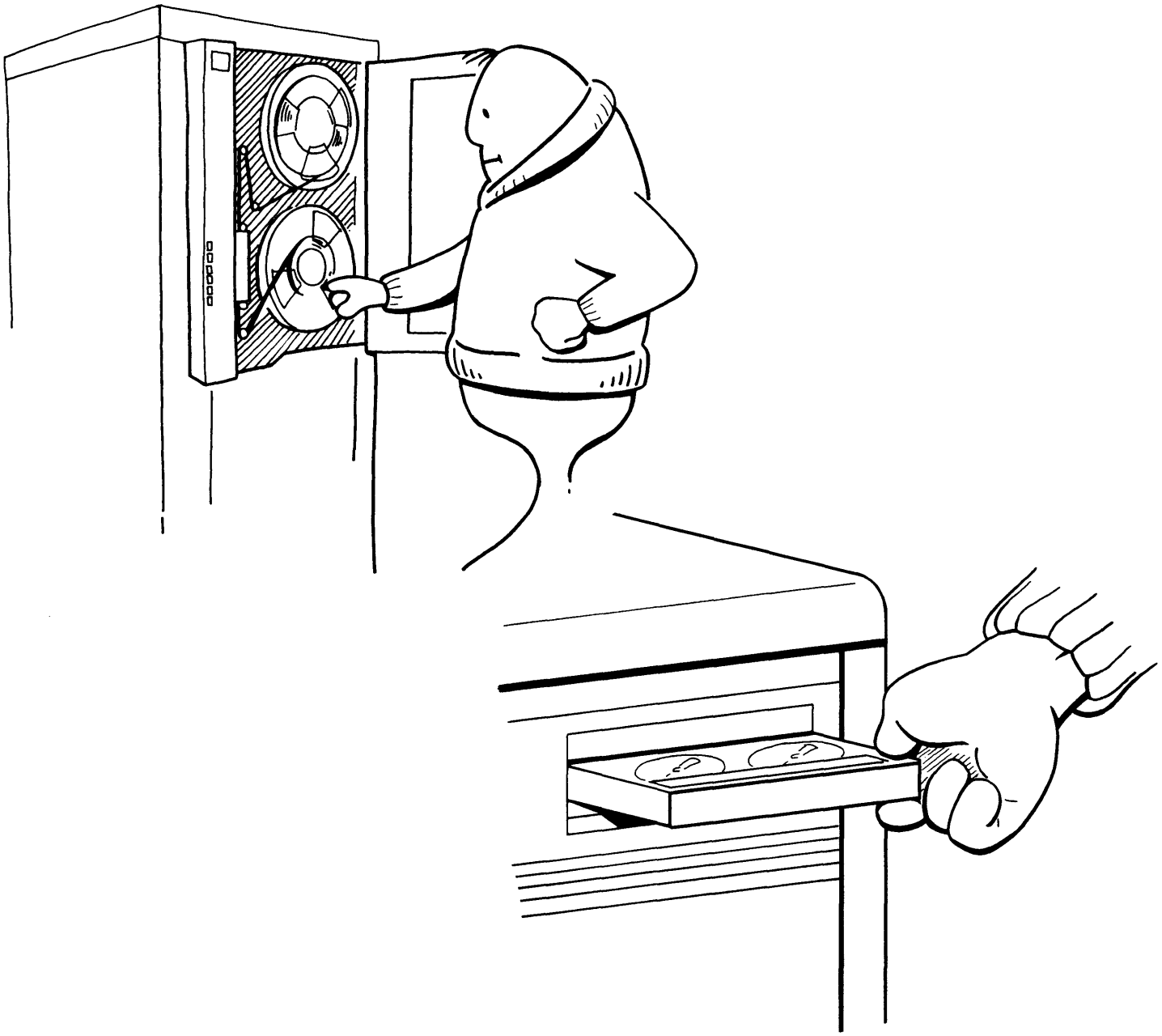
Step Three: Record What Was Happening When The Failure Occurred

The computer contains important information that should be transferred to a tape before you restart the system. To do this, you must have a tape containing the "Software Dump Facility", or SDF. Check with your System Manager; he or she should know where the tape is stored.

- Get the Software Dump Facility tape, and prepare it for file copying. If you're using reel tapes, insert a write ring into the reel. If you're using a cartridge tape, turn the arrow on the cartridge away from SAFE.
- Insert or mount the SDF tape on the tape drive that is assigned the device class name "DDUMP". If you're not sure which tape drive this is, check the list of devices posted at the Console.

  If you're using a cartridge tape, wait for the BUSY light to go out. If you're using a reel tape, press the LOAD button, then the ONLINE button. The tape will begin moving, then stop.


SAFE



- Check the Console for the "VOLUME MOUNTED" message, and look for the Control-B prompt on the left side of the screen:

```
->_
```

- If you don't see the prompt, hold down CTRL and type: B
- When you see the ">" prompt, type: D U M P Return
- The SDF program begins by identifying itself with this message on the Console:

```
SOFTWARE DUMP FACILITY (VER nn.nn/nn)
```

IMPORTANT

If you are using a version of the operating system that precedes G.01.00, you must type a second command to start the Software Dump Facility program. After you type "DUMP",

type: R U N Return

DO NOT type "DUMP" twice. If you do, you will copy the SDF, not the contents of main memory, onto the tape.

- When the memory dump is complete, remove the tape from the drive. If you're using cartridge tape, turn the arrow towards SAFE. If you're using reel tapes, remove the write ring. Label the tape and store it in a safe place. Go on to "Recovering From An Emergency Shutdown, Failure, Or Power Fail", on the next page.
- If nothing happens, make sure that the tape drive is on line. If you see the message below, contact your System Manager.

```
***DUMP FAILED
```

Recovering From An Emergency Shutdown, Failure, Or Power Fail

Press Return

One of two things could happen. If your computer is not set up to restart itself, you'll see only the Control-B prompt:

```
H for help->
            ↑ (look for the arrow; the letters or
              phrase preceding it will vary)
```

In this case, you must tell the computer that you want to begin the startup procedures.

But, if you see the question below, then your computer automatically begins the startup procedure by prompting you to choose a warmstart or coolstart:

```
->WHICH OPTION (WARMSTART/COOLSTART)?_
```

It's a good idea to assume that whatever caused the system to hang or fail in the first place can cause more problems. If you pick up exactly where you left off by doing a warmstart, the system may hang or fail again. But, doing a warmstart is the only way to save the spool files and scheduled jobs your computer "knew about" before the hang or failure.

A dilemma? No. The solution is to restart the computer twice:

- Once, to take care of unprinted reports and scheduled jobs. No activity, other than your session at the Console, is allowed.
- A second time, to start fresh. By coolstarting the computer, you'll be using a new copy of the operating system and other software programs.

First, Warmstart The Computer

Check your Console screen. If you don't see the question below, press Return.

```
WHICH OPTION (WARMSTART/COOLSTART)?_
```

If the question doesn't automatically appear, tell the computer to begin the startup procedure. At the Control-B prompt (">"), type: START Return

When you've prompted to choose a startup option, type: WARM Return

You'll see a warning message on the Console, like this:

```
**WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP
PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS
```

Even after " *WELCOME* " appears:

- DO NOT turn off the power to the computer.
- DO NOT generate the Control-B prompt.

IMPORTANT

The progress messages included in the examples throughout this chapter are a feature of the G.01.00 version of MPE. If you're using an earlier version of the operating system, you won't see them. You will, however, be asked the same series of questions to guide you in starting the system.

Watch For Progress Messages

Line by line, these messages will appear:

```
DIRECTORY MAINTENANCE COMPLETED
LOADING OF SYSTEM FILES IN PROGRESS
LOADING OF SYSTEM FILES COMPLETED
PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP
PART 2 OF 6 COMPLETED - SL BINDING
PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION
PART 4 OF 6 COMPLETED - DRIVER LOADING
PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP
PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION

BANK 0 DEPENDENT MEMORY USED -
```

The last message asks you to type in or verify the date and time. On a Series 37 computer, you'll see something like this:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
```

The date and time you see will be different, of course, but if you see a message like the one above, skip to "Verify The Date And Time", on the next page.

Other models of the HP 3000 computer don't have an internal clock to keep track of time. If you're using something other than the Series 37, you'll see this:

```
DATE (M/D/Y)?_
```

Follow the directions below to set the date and time.

Set The Date And Time

Type today's date, beginning with the month, then the day, then the year. For example:

If today's date is June 18, 1985, type: 0 6 / 1 8 / 8 5 Return

The computer will then ask you for the correct time:

```
TIME (H:M)?_
```

Type the time using a 24-hour (military) clock. For example:

If it's 8:35 in the morning, type: 0 8 : 3 5 Return

If it's 8:35 in the evening, type: 2 0 : 3 5 Return

Verify The Date And Time

If you've just typed in the date and time, or if the computer keeps track of it for you, it will ask for verification:

```
TUESDAY, JUNE 18, 1985, 8:35 AM? (Y/N)_
   ↑ (it figures out the day for you)
```

If either the date or time is incorrect, type: N O Return

You'll then see:

```
DATE (M/D/Y)?_
```

Follow the instructions on the previous page to type the correct date and time. When they're correct,

type: Y E S Return

You'll see the " *WELCOME* " message on the Console and, in most cases, the computer automatically starts your session:

```
:HELLO OPERATOR.SYS;HIPRI

                    (and some other information)
```

IMPORTANT

If your session wasn't automatically started, you'll have to log onto the Console yourself. If you're assigned OP capability, log on with high priority:

Type: HELLO OPERATOR.SYS;HIPRI Return

Or type: HELLO OPERATOR.SYS Return

Limit System Activity

Type: SHOWJOB STATUS Return

The last line of information on your Console tells you the job limit, session limit, and jobfence. For now, you want to prevent anyone from using the computer so that you can take care of spool files and scheduled jobs.

To set the limits to 0, type: LIMIT 0,0 Return

To set the jobfence to 14, type: JOBFENCE 14 Return

To check these new values, type: SHOWJOB STATUS Return

Check On Scheduled Jobs

Type: SHOWJOB SCHED Return

If the computer tells you there are "NO SUCH JOB(S)", skip to "Printing Any Leftover Spool Files", below. If there are any scheduled jobs, write down:

- The job name, listed in the last column on your screen.
- The date and time each job is scheduled to begin, in the "SCHEDULED—INTRO" column.

You'll use this information to restart the jobs after you shut down the computer again and coolstart it (which you'll do in just a moment).

Printing Any Leftover Spool Files

When you warmstart the computer, any spool files that were not printed before the shutdown, failure, or hang are saved. Ask the computer to list them:

Type: SHOWOUT SP Return

The spool files listed as "READY" can be printed now or copied onto a tape to be printed later. Any files listed as "OPENED" are still being prepared for printing by the computer. (You may not see any open spool files.)

If you have time to print the reports now, do so by following the directions below. If not, skip to page 10-49 and read "Saving The Leftover Spool Files" and copy them onto a tape. (After you coolstart the system, you'll transfer the spool files from tape to the computer so that they can be printed.)

To print the reports now, lower the system outfence:

Type: OUTFENCE 1 Return

If any individual outfences are set, lower these also:

Type: OUTFENCE 1;LDEV=nn Return
↑ *(use the LDEV number of your printer)*

The printer should immediately begin printing any READY spool files. If nothing's being printed, check the following things:

- Is the printer online?
- Is the spooler working for that printer?

  To check, type: SHOWDEV nn Return
  ↑ *(use your printer's LDEV number)*

  If the printer is listed as "UNAVAIL(able)", then you need to open the spool queue and/or start the spooler:

  Type: STARTSPOOL nn Return
  ↑ *(use your printer's LDEV number)*

  Check to see if it's available now:

  Type: SHOWDEV nn Return
  ↑ *(use your printer's LDEV number)*

  If not, repeat the STARTSPOOL command. Or, if you're using the G.01.00 version of the operating system,

  type: OPENQ nn Return
  ↑ *(use your printer's LDEV number)*

- Check the input priorities of the spool files that are ready for printing. Since you just lowered the outfence to 1, virtually all spool files should be eligible for printing. But, if any are deferred, raise their priority to 8:

  Type: ALTSPOOLFILE #Onnn;PRI=8 Return
  (the letter "O", not zero) ↑ ↑ *(the Device File ID number)*

- Repeat the ALTSPOOLFILE command for each deferred spool file. Then, ask the computer to list all of the spool files again:

  Type: SHOWOUT SP Return

As reports are printed, they will be deleted from the list. If there are no more reports to be printed, the computer will tell you that there are "NO SUCH FILES".

Once all the reports are printed, shutdown and restart the computer again, following the instructions on the next page.

Saving The Leftover Spool Files

To print the reports after you restart the computer, you'll perform the following steps:

- Copy the spool files onto a tape.
- Shutdown the computer, then restart it using a fresh copy of the operating system (a coolstart).
- Transfer the spool files from the tape back to the computer's disc so that they can be printed.

To copy spool files onto a tape, read "Creating A SPOOK Tape" in Chapter Four. When you're done, shutdown the computer again.

Shutdown The Computer Again

Hold down CTRL and type: A

At the "=" prompt, type: SHUTDOWN Return

If your computer isn't set up to automatically restart, you'll see just the Control-B (">") prompt. In this case, tell the computer to begin the startup procedure:

Type: START Return

You'll see the question below on your screen, prompting you to choose a startup option. (This question appears automatically if your system restarts itself.)

```
->WHICH OPTION (WARMSTART/COOLSTART)?_
```

Coolstart The Computer

To begin a coolstart, type: C O O L Return

The computer then asks you if you want to make any changes to the system:

```
ANY CHANGES?_
```

Unless your System Manager tells you otherwise, type: N O Return

The coolstart continues just as a warmstart did:

- You'll be warned not to interrupt the startup process.
- A series of progress messages is displayed on the Console.
- You'll be prompted to set and/or verify the date and time.
- A session for OPERATOR.SYS is automatically started on the Console, or the colon prompt is printed on the screen. If you see just the colon, you must begin your own session on the Console.

If you need help following any of these steps, read the description of a warmstart, beginning on page 10-43.

For More Information

Section IX of the MPE V/R System Operation and Resource Management Reference Manual (Part Number 32033-90005) documents the MPE message system. In it, you will find a list of system failure messages, listed in ascending numerical order. For each message, you'll find a brief description of the problem and a recommendation about handling the system following the failure.

In Section X of the same manual, you'll find a complete description of the Software Dump Facility, including how to create and use the SDF.

Guidelines For Your System

The following pages provide you with a convenient place to record the system hangs and failures you've encountered. Use them here, or use the page layout and headings as a guide for creating your own, separate log book.

Always record the following information when your system hangs or fails:

- The date and time.
- The system failure number, if you get a failure message on the Console.
- How you restarted the system.

DATE	TIME	FAILURE NUMBER	HOW RESTARTED	COMMENTS

DATE	TIME	FAILURE NUMBER	HOW RESTARTED	COMMENTS

DATE	TIME	FAILURE NUMBER	HOW RESTARTED	COMMENTS

DATE	TIME	FAILURE NUMBER	HOW RESTARTED	COMMENTS

Looking Back

1. What are the first things you should check when you have a hung terminal? A hung Console?

2. What are some of the symptoms of a system hang?

3. How does a system hang differ from a system failure?

4. If you've just performed an emergency shutdown or your system has failed, what do you do before starting the system?

5. Why do you start your system twice after a system hang, and what two startup options do you use?

Recovering From System Hangs And Failures Quick Reference

To Do:	Do This:
Troubleshoot a hung terminal:	1. Check to see if it's plugged into the power socket. 2. Check the serial port. 3. Check the [Remote] key or [Remote Mode] window. 4. Check the [AUTO LF] key or the [Auto LF] window. 5. Press the [BREAK] or [Reset/Break] key. If you see a colon prompt, type: ABORT [Return] or type: RESUME [Return] and press [Return] 6. Check the terminal's speed setting. 7. Type: ABORTIO␣nn [Return] ↑ *(the hung terminal's LDEV number)* 8. Repeat the command several times, until you see: `NO I/O TO ABORT` 9. Find out the session number of the user logged onto the hung terminal: Type: SHOWJOB␣JOB=@S [Return] 10. Using the session number, abort the session: Type: ABORTJOB␣#Snnn [Return]

To Do:	Do This:
Troubleshoot a hung Console (your first steps):	1. Check to see if it's plugged into the power socket. 2. Check the serial port. 3. Check the [REMOTE] key or [Remote Mode] window. 4. Check the [AUTO LF] key or the [Auto LF] window. 5. Press the [BREAK] or [Reset/Break] key. If you see a colon prompt, type: ABORT [Return] or type: RESUME [Return] and press [Return] 6. Check the terminal's speed setting.
Troubleshoot the Console if Control-A works:	1. Hold down [CTRL] and type: A. If you don't see the Control-A prompt, skip to "Handling A Hung System". If you do get the Control-A prompt, continue with these steps: 2. Type: RECALL [Return] 3. If there are any pending Console requests, answer each one: Type: REPLY nn,0 [Return] to deny the request. ↑ *(the PIN)* Or type: REPLY nn,nn [Return] to assign the device. *(the PIN)* ↑ ↑ *(the LDEV number)* 4. Ask someone to send a message to the Console using the TELLOP command. 5. Scroll the screen up to check the most recent Console messages. Note any LDEV numbers, particularly if the message is repeated. 6. For any "suspect" devices (starting with the LDEV numbers that repeatedly appeared in your Console messages), use the next command until you see the message "NO I/O TO ABORT". Type: ABORTIO nn [Return] ↑ *(the LDEV number)* 7. Type: ABORTIO 20 [Return] ↑ *(or use your Console's LDEV number, if it isn't "20")*

To Do:	Do This:
Troubleshoot the Console if Control-A works: *(continued)*	8. Go to another person's terminal (one that's still working), and log onto it: Type: HELLO OPERATOR.SYS;HIPRI [Return] 9. Move the Console to the working terminal: Type: CONSOLE nn [Return] ↑ *(the LDEV number of the working terminal)* 10. Abort your session at LDEV 20 (or the terminal you normally use as the Console). Type: ABORTJOB #Snnn [Return] ↑ *(the number of the session logged onto LDEV 20)* 11. Go back to LDEV 20 (or the terminal you normally use as the Console) and press [Return] a few times to see if you can get the colon prompt. 12. Warn everyone (in person) that the system may be going down, and, if they can, ask them to save their work and log off. 13. Force all sessions, including your own, to stop: Hold down [CTRL] and type: A Type: LOGOFF [Return] 14. Press [Return] a few times. If you still don't get a colon prompt, halt the system: Hold down [CTRL] and type: B Type: HALT [Return] 15. Or, press the HALT button (if your computer has one).

To Do:	Do This:
Following a system failure:	1. Get the tape containing the Software Dump Facility (SDF). 2. Prepare the tape. If you're using a cartridge tape, turn the arrow away from SAFE. If you're using a reel tape, insert a write ring into the reel. 3. Insert/mount the tape onto the tape drive assigned the device class name DDUMP. (If necessary, check your device list for the information.) On a cartridge tape drive, wait for the BUSY light to go out. On a reel tape drive, mount the tape, then press the LOAD and ONLINE buttons. 4. Start the Software Dump Facility: Hold down [CTRL] and type: **B** Type: **DUMP** [Return] **IMPORTANT** **If you're using a version of the operating system that predates G.01.00, follow the DUMP command by typing: RUN** [Return] 5. Wait while the computer finishes copying the information stored in memory to the tape. 6. Remove the tape. On a reel tape drive, press REWIND to rewind the tape, then take the reel off the drive. (Cartridge tapes rewind automatically.) 7. Secure the file. On a cartridge tape, turn the arrow towards SAFE. On a reel tape, remove the write ring. 8. Give the tape to your System Manager, or store it in a safe place. 9. Warmstart the computer to save spool files and scheduled jobs.

To Do: **Do This:**

Recover from a system hang:

IMPORTANT

Check with your System Manager to see if you should use the Software Dump Facility before restarting the computer. If so, read "Following A System Failure" in this section, or "Step Three: Record What Was Happening When The Failure Occurred" on page 10-38.

1. Press [Return]. If you don't see this:

```
WHICH OPTION (WARMSTART/COOLSTART)?":
```

   Type: **S T A R T** [Return]

3. When the question appears, type: **W A R M** [Return]
4. Warmstart the computer, using the Quick Reference information in Chapter Eight.
5. When you have recovered spool files and scheduled jobs, shutdown the computer again:

   Hold down [CTRL] and type: **A**

   Type: **S H U T D O W N** [Return]
6. Press [Return]. If you don't see this:

```
WHICH OPTION (WARMSTART/COOLSTART)?_
```

   Type: **S T A R T** [Return]

   When the question appears, type: **C O O L** [Return]

   Coolstart the computer, using the Quick Reference information in Chapter Eight.

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