HEWLETT PACKARD

HP 3000
Series 900
Computers

System Startup, Configuration, and Shutdown Reference Manual

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900 Series HP 3000 Computer Systems

System Startup, Configuration, and Shutdown Reference Manual

HEWLETT PACKARD

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Preface

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

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

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

Conventions

UPPERCASE

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

```
COMMAND
```

can be entered as any of the following:

```
command        Command        COMMAND
```

It cannot, however, be entered as:

```
comm           com_mand       comamnd
```

italics

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

```
COMMAND filename
```

bold italics

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

```
COMMAND(filename)
```

punctuation

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

```
(filename):(filename)
```

underlining

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

```
Do you want to continue? >> yes
```

{ }

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

```
COMMAND { ON  }
        { OFF }
```

[ ]

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

```
COMMAND filename [OPTION]
```

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

```
COMMAND filename [ OPTION    ]
                 [ parameter ]
```

Conventions (continued)

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

`[,`*parameter*`][...]`

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

`[`*parameter*`][,...]`

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

$$\left\{\begin{matrix}\mathbf{A}\\ \mathbf{B}\end{matrix}\right\}\,|\ \ldots\ |$$

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

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

(*parameter*)Δ(*parameter*)

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

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

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1

Introduction

This chapter defines system startup, system configuration, and system shutdown. It also briefly describes the procedures for starting, configuring, and shutting down a 900 Series HP 3000 computer system. The details for these procedures are discussed throughout the following chapters.

What Is System Startup?

System startup refers to the procedure for starting the computer software, namely the operating system, and other programs. System startup does not refer to installing the system for the first time. (A separate installation guide for your first loading of the new fundamental operating software (FOS) comes with each FOS tape. See note below.) Also, system startup does not refer to turning on the power to the computer, disk drives, tape drives, printers, or the system console. Normally, computer hardware remains powered on continuously.

How system startup is carried out

System startup involves several steps:

- resetting the system
- placing system files on the system disk, if the files do not already reside there
- starting the system using an autoboot or interactive sequence

Starting procedures are administered and controlled through initial system loader (ISL) utilities.

The initial system loader is software that provides a command-driven user interface for accessing boot utilities or issuing commands to display or change system startup functions. You can access ISL by resetting the system. (Refer to Chapter 2 for information on resetting the system.)

The `START` utility enables the system operator or system manager to start (boot or initialize) the system after system files have been placed on disk by the ISL `INSTALL` or `UPDATE` utilities, or after system memory has been stored to tape by the ISL `DUMP` utility.

Note

If you are installing the operating system for the first time, or if you are updating your current system, please follow the instructions in the *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001). This manual is packaged with the FOS and system load tape (SLT) that you receive from Hewlett-Packard.

There are two booting sequences available for the 900 Series HP 3000: autoboot and interactive. The autoboot sequence takes its utility commands from an autoexecute file, also referred to as an autoboot file, and requires no operator intervention to start the operating system. The interactive sequence prompts the system manager or system operator for the utility commands and options to start the operating system.

Autoboot and interactive sequences are discussed in detail in Chapter 2 and Chapter 3.

What Is System Configuration?

System configuration is the means by which you define, in terms meaningful to the operating system, any or all of the peripheral devices attached to the computer for the input (entering) or output (storing or displaying) of data. Such devices include terminals, printers, disk drives, and tape drives.

System configuration also includes the definition or modification of system parameters other than the input/output (I/O) device configuration. These parameters include system tables, the message catalog, user logging processes, system logging events, and other system resources.

How System Configuration Is Performed

System configuration and generation procedures are administered and controlled through the system generator (SYSGEN) utility.

SYSGEN is a program that enables a user with system manager (SM) capability to view, create, modify, and save system I/O configuration data. (A user with system supervisor (OP) capability may only view I/O configuration data.) In addition, the system manager can add, remove, and replace system boot files and system libraries by creating a system load tape (SLT).

The system stores configuration data in groups and allows for multiple groups to reside on disk. SYSGEN builds on an existing configuration group to change that configuration or to create a new configuration. The new configuration data can be stored on disk or tape. This SLT tape can then be used to install an entirely new copy of the operating system or to update an existing copy.

Note

SYSGEN does not support configuring terminals into the system. For information on terminal configuration, refer to the *HP 3000/iX Network Planning and Configuration Guide* (36922-61023).

What Is System Shutdown?

System shutdown refers to stopping the computer's software, operating system, and other programs. (Stopping system activity makes the computer inaccessible to users.) A system shutdown does not imply turning off power to the computer hardware.

How system shutdown is carried out

Shutdown procedures are performed by the system console command:

```
(CTRL)A
=SHUTDOWN
```

The `=SHUTDOWN` command logs off all remaining sessions, including the session logged on at the console. All system processes are stopped in an orderly manner. Completing all system activity and processing before shutdown, maintains the integrity of all system tables and directories.

Shutting down the system consists of several steps:

- telling users well in advance of a planned shutdown
- warning users 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
- shutting open communication lines
- suspending or aborting any jobs, and aborting sessions
- entering the `=SHUTDOWN` command

Chapter 9 outlines detailed procedures for shutting down the system.

2

Initiating System Activity

Separate firmware routines of processor-dependent code (PDC) and input/output-dependent code (IODC) perform the system self-test and initialization after resetting HP Precision Architecture hardware.

The initial program load (IPL), the first software retrieved from the boot device, implements the operating-system-independent portion of the bootstrap process. The initial system loader (ISL), a boot-device-based IPL utility, provides the user interface for displaying or modifying system startup functions.

Resetting the System

There are two general types of resets for the 900 Series HP 3000: a soft reset and a hard reset.

Soft Reset

A *soft reset*, the type of reset used most often, preserves the current processor state. This type of reset performs a nondisruptive memory test and terminates all I/O operations before executing recovery software for starting the boot device and console selection process. A soft reset can also occur during a software reboot at the completion of a bootable ISL utility, such as **INSTALL**, **UPDATE**, or **DUMP**.

More information on issuing resets from the console is provided later in this chapter.

Note

You can also initiate soft resets on the Series 922 through Series 949 systems by using the front panel RESET switch, which is described later in this chapter.

Hard Reset

A *hard reset* is disruptive. It initiates the processor self-test that resets memory and terminates all I/O operations. A hard reset is necessary after a hardware failure or after an error from which the system cannot recover.

A hard reset is initiated when the CPU is powered on. If the system is powered on already, then entering the reset command, **RS**, at the system console initiates the hard reset process. Using the front panel RESET switch on the Series 950 through Series 980 systems, shown in figure 2-2, also performs a hard reset; however, you should use this switch for a hard reset only if the **RS** command fails. (The RESET

switch on the Series 922 through Series 949 systems, shown in figure 2-1, initiates a soft reset.)

More information on issuing resets from the console is provided later in this chapter.

Resetting the system using the console

The console interfaces with the 900 Series HP 3000 through the access port (AP) located in the channel I/O (CIO) section of the system card cage. In addition to providing other features and commands, the AP allows the system manager or system operator (OP capability) to issue hard or soft resets from the console keyboard instead of using the front panel reset switch. (The system is secured from anyone accidentally entering an AP command. It responds to AP commands only when the console is placed in control mode by entering (CTRL) (B).)

The access port supports two two-character commands for resetting the system, as described in Table 2-1.

Table 2-1. AP Reset Commands

Command	Description
RS	Reset SPU (hard reset). This command, is equivalent to using the RESET switch on Series 950 through 980 systens or to powering on Series 922 through Series 949 systems. RS initiates a processor self-test that resets memory and terminates all I/O operations. Do not use this type of reset in preparation for a dump.
TC	Transfer of control (soft reset). This command, equivalent to using the RESET switch on Series 922 through 949 systems, initiates a reset that preserves the current processor state, terminates all I/O operations, and performs a nondisruptive memory test.

Refer to Appendix A for details about using the AP support interface for functions other than resetting the system.

To reset the system using the access port (AP), follow the directions listed below:

1. Place the console in control mode by entering CTRL B at the system prompt.

   The console responds by displaying the control mode prompt (CM>) and activating the system status line at the bottom of the screen:

```
CM>
:
Code: F1FF REMOTE: disabled inactive multiple ACCESS
FAULT:00
```

2. Issue the reset command. Enter:

Note

If you have a 99X system, you must transfer to the service processor before you reset the system.

```
CM> SP
```

```
CM> RS ** Hard reset **

or

CM> TC ** Soft reset  **
```

If you have a 9X8LX or 9X8RX system, a PDC menu is displayed when you issue CTRL B. From that menu, you can proceed to boot your system by typing BO. No specific reset is required.

Example 2-1 demonstrates a soft reset of the system with autoboot disabled using the console and AP commands for a Series 949 system. The reset screen may a contain different boot path and additional information, depending on the system you are using.

```
CM> TC

Processor Dependent Code (PDC) revision 2.2

Console Path        = 4.2.0.0.0.0.0
Primary boot path   = 4.1.0.0.0.0.0
Alternate boot path = 4.5.0.0.0.0.0

Boot from primary boot path (Y or N)?>
```

Example 2-1. Resetting Series 949 System Using AP Commands: Autoboot & Disabled

Answering NO to the boot path prompt initiates other prompts that query for the proper path to the boot device. If you answer YES to the primary path prompt, the system displays additional messages as it boots the processor and operating system.

Example 2-2 demonstrates a soft reset of the system with autoboot enabled, using console and AP commands for a Series 949 system. The reset screen may contain a different boot path display and additional information, depending on the system you are using.

Note

If you have a 99X system, you must transfer to the service processor before you reset the system.

```
CM> SP
```

If you have a 9X8LX or 9X8RX system, you need to type BO to boot the system from the primary path.

```
CM> TC


Processor Dependent Code (PDC) revision 3.2

Console Path        = 4.2.0.0.0.0.0
Primary boot path   = 4.1.0.0.0.0.0
Alternate boot path = 4.5.0.0.0.0.0


Autoboot from primary path enabled.
To override, press any key within 10 seconds.
```

Example 2-2. Resetting a Series 949 System Using AP Commands Autoboot & Enabled

If you do not press a key to interrupt the sequence, the system displays messages as it automatically boots the processor and operating system.

The autoboot flag setting determines whether the system searches for an autoexecute file with which to boot the operating system automatically.

Note

If an autobooting system cannot locate a valid autoexecute file, it boots to ISL; therefore, you see the statement `Cannot find an autoexecute file. AUTOBOOT ABORTED.` This does not present any problems; just continue with the `START` command in ISL.

Resetting the system with the front panel switches

As indicated above, it is recommended that hard resets be done from the console rather than from the RESET switch whenever possible. The following information discusses using the RESET buttons.

The reset switch (a lock labeled "ENABLED, SECURED, and RESET") for the Series 922 through Series 949 systems is located behind the cover on the right end of the access panel. Figure 2-1 indicates the location of the switch on these systems.

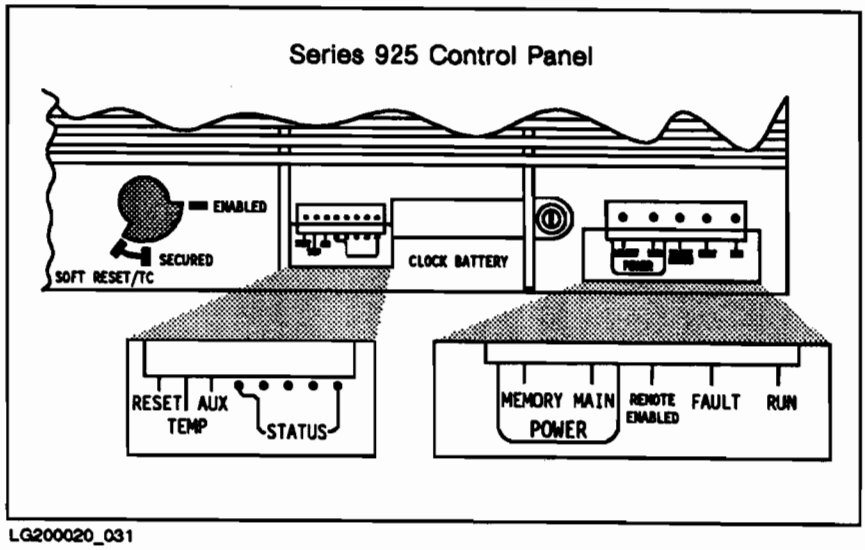


Figure 2-1.
Location of Series 922 through Series 949 Systems Reset Switch

The reset button (a gray button marked Reset) for the Series 950 through 980 systems is located underneath the cover of the horizontal portion of the system control panel. Figure 2-2 indicates the location of this button on these systems.

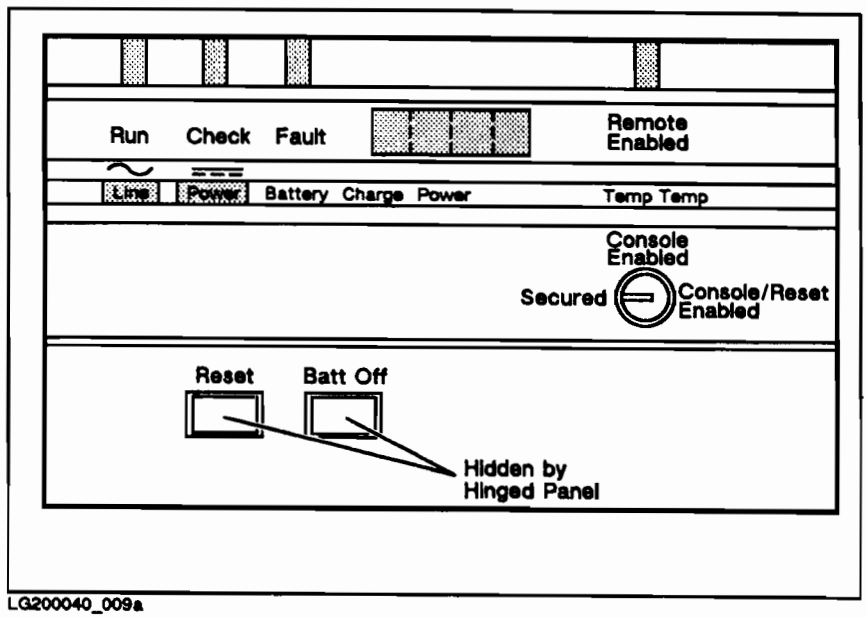


Figure 2-2.
Location of Series 950 through Series 980 Systems Reset Button

Caution

Pressing the reset button on Series 950 through 980 systems initiates a hard reset. Hard resets are disruptive resets that terminate all I/O operations and reset system memory. For this reason, reset Series 950 through Series 980 systems with the reset button only when other attempts to clear system failures have failed or when the data in memory and I/O processes are expendable.

Do not use the reset button to reset Series 950 through Series 980 systems for a dump. Resetting these systems with the reset button invalidates dump data.

Pressing the reset button on Series 950 through Series 980 systems initiates a hard reset.

Resetting Series 922 through Series 949 systems by placing the key in the reset switch and turning the key to RESET initiates a soft reset.

The system responds by self-testing its components and issuing messages. Example 2-3 demonstrates the messages received at the consoles of a Series 949 system. The reset screen may contain a different boot path display and additional information, depending on the system you are using.

```
Processor Dependent Code (PDC) revision 2.9

Console Path         = 4.2.0.0.0.0
Primary boot path    = 4.1.0.0.0.0
Alternate boot path = 4.5.0.0.0.0

Enter boot path, command, or ?>
```

Example 2-3. Resetting a Series 949 System Using the Reset Switch & Autoboot Disabled

Note Disabling and enabling autoboot is explained in Chapter 3.

Answering NO to the boot path prompt initiates other prompts that query for the proper path to the boot device. If you answer YES to the primary path prompt, the system displays additional messages as it boots the processor and operating system. (Information on appropriate boot paths is provided later in this chapter.)

The messages received after a system is reset depend on whether autoboot is enabled. Recall that autoboot describes the system's capability to boot itself (without operator intervention) after it has been reset. Messages from a system with autoboot enabled differ from the messages received at a system with autoboot disabled. Example 2-4 demonstrates the messages received from a Series 949 system.

```
Processor Dependent Code (PDC) revision 2.9

Console Path         = 4.2.0.0.0.0
Primary boot path    = 4.1.0.0.0.0
Alternate boot path = 4.5.0.0.0.0

Autoboot from primary path enabled.
To override, press any key within 10 seconds.
```

Example 2-4. Resetting a Series 949 System Using the Reset Switch: Autoboot Enabled

If you do not press a key to interrupt the autoboot sequence, the system displays messages as it automatically boots the processor and the operating system.

Determining and Selecting Input and Output (I/O) Paths

The system identifies adapter interfaces to a system bus and the associated devices by an I/O path. The *I/O path* is the address of the interface hardware and the physical path to reach a device.

When the system is reset or the power is turned on, hardware routines read and initialize the I/O paths needed to boot the system. These boot paths consist of the primary boot path, for booting from disk-resident software; the alternate boot path, for booting from a system load tape; and the console boot path, for locating console operator intervention.

Boot paths for the primary boot device, the alternate boot device, and the console are shown as numbers separated by periods.

Series 922 through Series 949 boot paths

Each I/O path is constructed "top down" from where the device is physically attached to the system. The Series 922 through Series 949 I/O path is determined by the channel adapter (CA) module number, the device adapter (DA) slot number, and the device address:

```
CA Module Number.DA Slot Number.Device Address
```

The CA module number specifies the number of card slots in the central bus (CTB) that the channel adapter is attached to, multiplied by four. The Series 922 through Series 932 CA modules are assigned a numerical value of 4 or 8. The Series 935 CA module is assigned a numerical value of 4 or 36. The Series 949 CA module is assigned a numerical value of 8 or 40.

DA slot numbers range from 0 to 13. Slots 0 through 7 are recommended for use.

The address of the device itself depends on the adapter. In addition, data communication devices may have an additional logical or virtual device number in the I/O path specification.

For example, in figure 2-3 the CA module number is 4, the HP-IB channel CIB interface slot is 5, and the magnetic tape device address is 0. This establishes an I/O path for the tape drive as 4.5.0.0.0.0.0.0. Trailing zeros (those occurring after the third digit) are intended for future use.

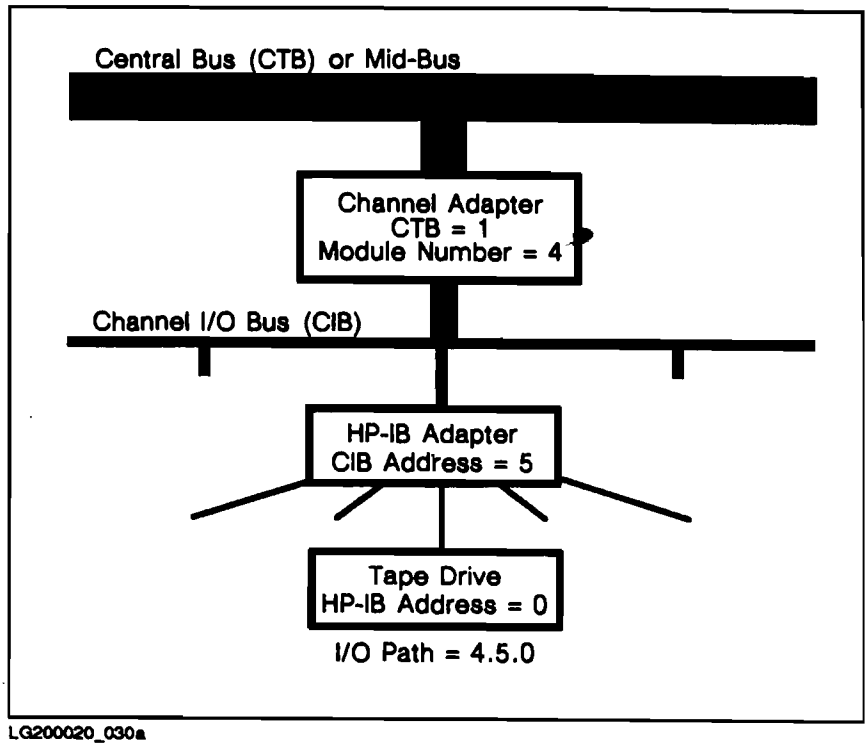


Figure 2-3. Series 922 through Series 935 I/O Device Paths

Series 950 through Series 980 boot paths

On Series 950 through Series 980 systems, I/O path construction begins with the bus converter (BUS CONV), which connects the system's main bus (SMB) and central bus (CTB). The channel adapter connects the central bus and the channel I/O bus (CIB). The logical construction concludes with the device adapter, which connects the I/O device to the CIB. An I/O device connects to a device adapter card through an interface cable.

A Series 950 through Series 980 I/O path is specified as follows:

```
BUS CONV/CA Module Number.DA Slot Number.Device Address
```

The bus converter specifies the number, either 2 or 6, of the interface slot that contains the adapter boards for the SMB and the central bus.

The CA module number specifies the number of the interface slot that contains the adapter boards for the central bus and the CIB. The CA module number is assigned a numerical value of 4, 8, 16, 20, or 24.

DA CIO section slot numbers range from 0 to 4.

The address of the device itself depends on the adapter. In addition, data communication devices may have an additional logical or virtual device number in the I/O path specification.

In figure 2-4, for example, the bus converter is 6, the CA module number is 4, the HP-IB channel CIB interface slot is 3, and the

magnetic tape device address is 3. This establishes an I/O path for the tape drive as 6/4.3.3.0.0.0.

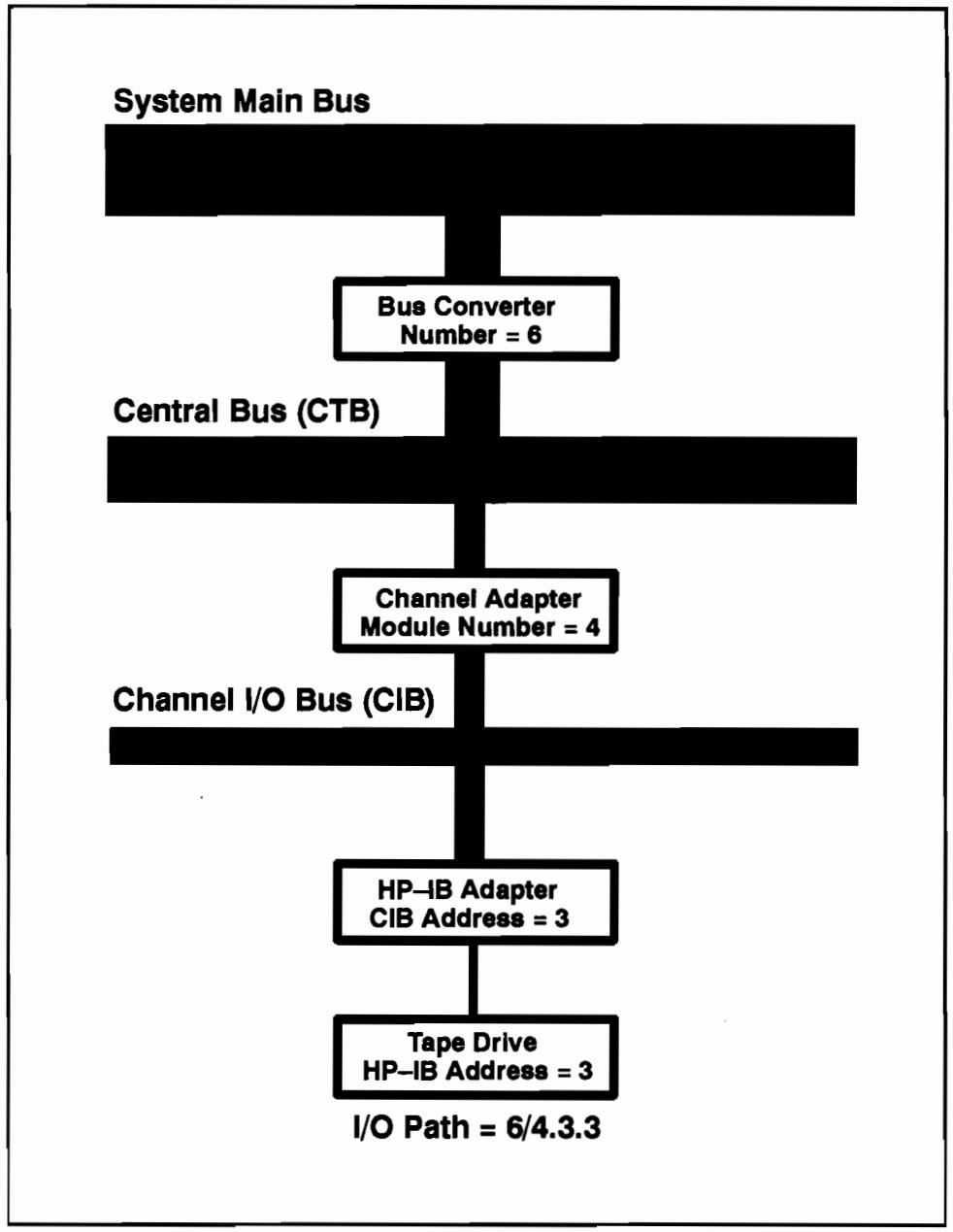


Figure 2-4. Series 950 through Series 980 I/O Device Paths

There are several ways to determine the I/O path for devices that are attached to the system:

- Refer to figures 2-3 and 2-4 for address and physical connection information.
- Generate a list of paths for devices that have already been configured by using the `LPATH` command of the SYSGEN utility IO Configurator. SYSGEN does not tell you if the configured device is

active or available. During the system boot (using the ISL **START** command), information on which paths have been configured and which devices are available or not available is listed as the "System State at Boot Time." (For more information on the system state, refer to Chapter 3 and Appendix B. For more information on SYSGEN, refer to Chapter 4.)

- Use the ISL utility, **IOMAP**, to list the devices on the system. (For more information on **IOMAP**, refer to Appendix E.) For 9X8LX and 9X8RX systems, use the ODE utility to list devices on the system.

Testing the System

A 900 Series HP 3000 system undergoes a self-test upon reset. The Series 922 through Series 949 systems test various system components including:

- central processing unit (CPU)
- instruction unit
- execution unit
- floating-point coprocessor
- register file
- translation look-aside buffer (TLB)
- cache boards
- installed memory controllers and arrays
- all I/O cards that have built-in, executable test routines

The self-test also initializes the channel I/O adapter (CA) and device adapter (DA) boards along with the first memory controller.

The Series 950 through Series 980 systems verify that enough hardware is functioning to load and execute extended diagnostic programs from initial program load (IPL). This involves testing the processor, the first memory controller, the console and boot devices, and the I/O paths to the console and boot devices.

If the initial Series 950 through Series 980 self-test is successful, the code performs a full processor test by testing the following:

- nonvolatile memory (NVM)
- stable storage
- central processing unit (CPU)
- system interface unit (SIU)
- cache boards
- translation look-aside buffer (TLB)

After resetting and testing, the system either autoboots or initiates an interactive boot sequence. Whether or not the system autoboots depends on how the autoboot flag is set and the presence of an autoboot file. For information on using the **AUTOBOOT** command, refer to Chapter 3.

The Booting Process

The process of booting the processor-dependent code (PDC) and the input/output-dependent code (IODC) takes place immediately after the system self-test. The initialization process is hardware-driven and begins automatically.

After the system is reset, the PDC and IODC boot sequence messages indicate or prompt for the I/O paths required for successful completion. For more information on proper I/O paths for startup, refer to the previous section.

Autobooting the system

Autobooting allows you to boot the system from the primary boot path without the need to make any keyboard entries.

Boot messages vary slightly depending on whether autoboot is enabled. The following examples show some typical boot sequences and illustrate use of the material covered up to this point (resetting the system, system self- test, and using I/O paths).

Autobooting a system is usually accomplished by enabling autoboot with the ISL `AUTOBOOT` command, resetting the system, and following the system's prompts. For information on the `AUTOBOOT` command, refer to Chapter 3.

Even when autoboot is disabled (or you have interrupted an enabled autoboot sequence as described in the next section), the system still allows you the option of autobooting by issuing an **`Interact with IPL (Y or N)?>`** message. (Bypassing a disabled autoboot flag setting to autoboot a system is discussed later in this chapter.)

Example 2-5 demonstrates autobooting a Series 925 system. The example is a partial listing of an uninterrupted autoboot (autoboot enabled) sequence. The screen may contain a different boot path display and additional information, depending on the system you are using.

Note

If you are using a Series 949 system, your primary boot path is 8.1.0.

```
CM> TC


Processor Dependent Code (PDC) revision 3.2

Console path = 4.2.0.0.0.0.0
Primary boot path = 4.1.0.0.0.0.0
Alternate boot path = 4.5.0.0.0.0.0

Autoboot from primary boot path enabled.
To override, press any key within 10 seconds.

10 seconds expired -- proceeding with autoboot.

Booting from primary boot path = 4.1.0.0.0.0.0

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Soft Booted.
MMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.28 July 15, 1993

ISL booting START AUTO
⋮
```

Example 2-5. Autobooting a Series 925 System

In example 2-5, autoboot must be turned on, and an autoboot file (also known as an autoexecute file) must reside in the logical interchange format (LIF) directory for ISL to autoboot. If not, you get the message `Cannot find an autoexecute file. AUTOBOOT ABORTED.` For information on turning on autoboot, refer to Chapter 3. For information on replacing autoboot files using SYSGEN, refer to Chapter 8.

Interrupting an autobooting system

Even with the autoboot sequence in effect, you can override it to select an alternate boot medium (for example, a tape drive or another disk drive), to activate a different ISL utility, or to enter a different set of options. This is accomplished by pressing any key within 10 seconds after receiving the message that autoboot has been enabled.

Example 2-6 provides a partial listing of an interrupted autoboot sequences for a Series 925. Other systems may display different messages and boot paths.

```
CM> TC

Processor Dependent Code (PDC) revision 3.2

Console path = 4.2.0.0.0.0.0
Primary boot path = 4.1.0.0.0.0.0
Alternate boot path = 4.5.0.0.0.0.0

Autoboot from primary boot path enabled.
To override, press any key within 10 seconds.

** A key is pressed **

Boot from primary boot path (Y or N)?> n

Boot from alternate boot path (Y or N)?> n

Enter boot path, command, or ?> 4.1.0


Booting.

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Interact with IPL (Y or N)?> y


Soft Booted.
MMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.28 July 15, 1993

ISL>
```

Example 2-6. Interrupting Autobooting Series 925 System.

When the sequence is interrupted, you are asked to select whether the system should boot from the primary system disk or from a system load tape on the alternate boot path. A third prompt allows you to enter a different boot path interactively. As another option, if you enter a "?" at the **Enter boot path, command,** or **?** prompt, you see a menu of boot command options.

The menu and boot command options can differ depending on your system. Example 2-7 shows the menu for a Series 925 System.

```
Use BC/1.2.3 format for boot path.

The following commands are available:
   RESTART    Restart the boot device selection
   BOOT       Boot the system again (hard boot)
   INFO       Display boot information/warnings
   LANG       Select Language for boot messages
   MEM_DUMP   Read/Write address locations
   FASTBOOT   Enable/Disable memory testing
   TESTBOOT   Enable/Disable test boot sequence
   HELP       Print this help list

Enter boot path, command, or ?>
```

Example 2-7. Boot Command Options for a Series 925 System

If you enter an improper boot path, forget to place the boot device online, or if the disk or tape medium is defective, the system displays a boot device status along with one or more four-character boot error codes on the system console. Example 2-8 demonstrates a system's possible response to an improper boot path.

```
CM> TC


Processor Dependent Code (PDC) revision 3

Console path = 2/4.1.0.0.0.0.0
Primary boot path = 2/4.1.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

Autoboot from primary boot path enabled.
To override, press any key within 10 seconds.

** A key is pressed **

Boot from primary boot path (Y or N)?> n

Boot from alternate boot path (Y or N)?> n

Enter boot path, command, or ?> 8.2.4

Interact with IPL (Y or N)?> y

Booting.

Boot error on path 8.2.4.0.0.0.0

No device at indicated physical module -- check path

Boot from primary boot path (Y or N)?>
```

Example 2-8. A System's Response to an Improper Boot Path

A Series 950 system was used in example 2-8. Other 900 Series HP 3000 systems perform similarly, although their boot paths may be different from the example shown. For an explanation of boot error codes, refer to *MPE/iX Error Message Manual Volumes I, II, and III* (32650-90066, 32650-90152, and 32650-90368).

The message `Interact with IPL (Y or N)?` gives you an additional chance to autoboot even if you previously indicated an autoboot override (or have autoboot disabled). Answering `NO` to the `Interact` message returns the system to attempt an autoboot.

Interactively booting the system with autoboot disabled

Interactively booting the system with autoboot disabled allows you to select a particular boot path or to activate ISL from the keyboard.

The initial interactive sequence is similar to the initial autoboot sequence, except in the interactive sequence, the system does not prompt the user with the option to override the process. Example 2-9 demonstrates the interactive boot sequence for a Series 922 system. The screen display may contain a different boot path and additional information, depending on the system you are using.

Note

If you have a 99X system, you must transfer to the service processor before you reset the system.

```
CM> SP
```

```
CM> TC


Processor Dependent Code (PDC) revision 3.2

Console path = 4.3.0.0.0.0
Primary boot path = 4.1.0.0.0.0
Alternate boot path = 4.5.0.0.0.0

Boot from primary boot path (Y or N)?> y

Booting

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Interact with IPL (Y N)?> y

Soft Booted.

NMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.28 July 15, 1993

ISL>
```

Example 2-9. Interactively Booting a Series 922 System

In this example, the system halts at ISL and then waits for the operator to issue an ISL command. For more information on ISL and ISL utilities, refer to Chapter 3.

Bypassing the disabled autoboot setting

Answering NO to the prompt `Interact with IPL (Y or N)?` causes the system to ignore a disabled autoboot flag setting and attempt to autoboot.

Example 2-10 demonstrates bypassing a current disabled autoboot flag setting in order to autoboot.

```
CM> TC

Processor Dependent Code (PDC) revision 3.2

Console path = 2/4.1.0.0.0.0.0
Primary boot path = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

48 MB of memory configured and tested.

Soft-Booted--memory state is valid

Boot from primary boot path (Y or N)?> n
Boot from alternate boot path (Y or N)?> n
Enter boot path, commands, or ?> 2/4.0.0

Interact with IPL (Y or N)?> n

Booting

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Booted.

NMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.00 July 15, 1993

    Cannot find an auto-execute file.  AUTOBOOT ABORTED.

ISL>
```

Example 2-10. Bypassing the Disabled Autoboot Setting When Booting a System

System Startup Procedure

The following procedure is an example of what to enter and what it looks like to start a system. To initiate the startup process enter:

CTRL B

Note

If you have a 99X system, you must transfer to the service processor before you reset the system.

```
CM> SP
```

If you have a 9X8LX or 9X8RX system, a PDC screen is displayed. Type BO to boot from the primary path.

```
CM> TC

Processor Dependent Code (PDC) revision 3.2

Console path = 2/4.1.0.0.0.0.0
Primary boot path = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

Boot from primary boot path (Y or N)?> y

Interact with IPL (Y or N)?> Y

NMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.28 July 15, 1993

    Cannot find an auto-execute file.  AUTOBOOT ABORTED.

ISL>start recovery
Initialize_genesis - Version  :  <<870204.1552>>
THU, APR 27, 1989,  2:23:36PM (y/n)? y
:
```

Example 2-11. System Startup Procedure

Note

Currently there is no autoexecute file available; therefore, you must ignore the statement `Cannot find an auto-execute file. AUTOBOOT ABORTED.` This does not present any problems; just continue with the `START` commnand in ISL.

For further information about system startups, refer to Chapter 3.

3

System Startup Functions

The initial system loader (ISL) provides a command-driven user interface for accessing boot utilities or issuing ISL commands to display or change system startup functions. When the system is booted from tape (tape boots), processor-dependent code (PDC) directly loads the ISL. When the system is booted from disk (disk boots), PDC and input/output-dependent code (IODC) boot the utility **MMSAVE**, which in turn boots ISL.

When loaded, the ISL displays its revision number and prompts for input:

```
ISL Revision A.00.07  September 12, 1990

ISL>
```

Note The prompt changes to **ISL>**, indicating the ISL is active.

Initial System Loader (ISL)

On tape boots, the ISL is loaded directly by the processor-dependent code (PDC). ISL reads the logical interchange format (LIF) directory from tape and uses this directory to find other files on the tape.

On disk boots, the PDC and IODC boot the utility **MMSAVE**, which in turn boots the ISL. PDC and IODC read the first record or sector of the boot device, which is the LIF label. The LIF label contains a pointer to the **MMSAVE** boot image. PDC reads and launches **MMSAVE**. **MMSAVE** writes a 16-megabyte section of main memory to the **DUMPAREA** file, whose address is found in the LIF directory. This allows memory space for the ISL and **DUMP** utilities to be loaded. **MMSAVE** boots ISL, which then uses the LIF label to find the LIF directory. As a last step, ISL uses the directory to find other files it needs.

The system displays messages indicating the completion of the booting and loading routines as they occur.

Using initial system loader (ISL) commands

ISL commands change or display boot path information and ISL utility names. Table 3-1 lists commands that do not execute a utility function. ISL utilities and options are described later in this chapter.

Table 3-1. ISL Commands.

Command	Meaning
HELP or ?	Lists ISL commands and definitions, along with the ISL utilities available through the selected boot media.
LISTF or LS	Lists the ISL utilities available through the selected boot media.
AUTOBOOT	Sets or clears the autoboot flag in stable storage. (Stable storage is memory that retains its information until overwritten. Stable storage stores boot path information along with other critical system parameters.)
AUTOSEARCH	Sets or clears the autosearch flag in stable storage.
PRIMPATH	Modifies the primary boot path in stable storage.
ALTPATH	Modifies the alternate boot path in stable storage.
CONSPATH	Modifies the system console boot path in stable storage.
DISPLAY or DI	Displays the current paths in stable storage for the primary, alternate, and the console boot paths. DISPLAY also shows the status of the autoboot and autosearch flags.
LISTAUTOFL or LSAUTOFL	Lists the contents of the current autoboot file.
FASTSIZE	Sets or displays FASTSIZE.
SUPPORT	Boots the support tape from the boot device.
READNVM	Displays the contents of 1 word (4 bytes) of nonvolatile memory (NVM). (NVM is memory that retains its information, in standard hexadecimal format, until overwritten.) Specify the word address in either decimal or hexadecimal.
READSS	Displays the contents of 1 word (4 bytes) of stable storage. Specify the word address in either decimal or hexadecimal. The display is in standard hexadecimal format.

For more information on the contents of stable storage and NVM, refer to Appendix C.

Using the help facility for ISL commands

Example 3-1 demonstrates using the ISL command, HELP. To display help listings for all ISL commands, enter either HELP, HE, or the symbol "?" at the ISL prompt: The display on your screen may vary depending on the model of HP 3000 you have.

```
ISL> HELP

?              Help Facility
HELP           Help Facility
LISTF          List ISL utilities
LS             List ISL utilities
AUTOBOOT       Set or clear autoboot flag in stable storage
AUTOSEARCH     Set or clear autosearch flag in stable storage
PRIMPATH       Modify primary boot path in stable storage
ALTPATH        Modify alternate boot path in stable storage
CONSPATH       Modify system console path in stable storage
DISPLAY        Display boot and console paths in stable storage
LSAUTOFL       List contents of autoboot file
LISTAUTOFL     List contents of autoboot file
FASTSIZE       Sets or displays FASTSIZE
SUPPORT        Boot the Support Tape from the boot device
SUPPORTCD      Boot the Support Tape from the CDROM
READNVM        Displays contents of one word of NVM.
READSS         Displays contents of one word of stable storage
LSBATCH        List contents of batch file
LISTBATCH      List contents of batch file
BATCH          Execute commands in batch file
LSEST          List contents of EST (Extended Self Test) file
LISTEST        List contents of EST (Extended Self Test) file
EST            Execute commands in EST (Extended Self Test) file
```

Example 3-1. Using the HELP Command

```
Utilities on this system are:


filename   type   start   size     created
================================================
START      -12864 992896 27208   89/11/37 10:34:44
SAT        -12864 481344 25528   89/11/37 08:25:51
ISL        -12864 419936 152     89/11/37 08:25:27
DISCUTIL   -12864 463872 17464   89/11/37 08:25:36
DUMP       -12864 963904 16424   89/11/37 09:44:12
ISL        -12864 419936 152     89/11/37 08:25:27
A1002AI    -12864 480256 544     89/11/28 16:21:50
A1002AM    -12864 480800 408     89/11/28 16:21:51
A1002AP    -12864 481216 4600    89/11/28 16:21:54
A1100AI    -12864 485824 856     89/11/28 16:21:54
A1100AM    -12864 486688 496     89/11/28 16:21:55
A1100AP    -12864 487184 3400    89/11/28 16:21:58
EDBC       -12864 537024 2080    94/11/53 16:43:49
EDPROC     -12864 539104 8848    94/11/53 16:43:55
LASIDIAG   -12864 516688 752     94/11/53 16:43:56
LDIAG      -12864 517440 5808    94/11/53 16:44:00
MAPFILE    -12864 421600 16      94/11/53 16:44:00
MAPPER     -12864 523248 336     94/11/53 16:44:01
MDIAG      -12864 523584 6240    94/11/53 16:44:05
MEMTEST    -12864 421616 321     94/11/53 16:44:05
MPROC      -12864 447760 1408    94/11/53 16:44:07
ODE        -12864 421936 432     94/11/53 16:44:07
SYSLIB     -12864 422368 688     94/11/53 16:44:08
TDIAG      -12864 529824 7200    94/11/53 16:44:13
UNIPROC    -12864 453504 4464    94/11/53 16:44:16
BCDIAG     -12864 423056 960     94/11/53 16:44:17
CAEXR      -12864 444720 672     94/11/53 16:44:18
IOMAP      -12864 445392 1536    94/11/53 16:44:19
CLKUTIL    -12864 424016 312     94/11/53 16:44:20
SADPATCH   -12864 446928 832     94/11/53 16:44:20
```

Example 3-1. Using the HELP Command (continued)

Note

The list of ISL utilities differs, depending upon whether they have been loaded from tape or disk and upon which model of HP 3000 you have. The utilities listed in examples 3-1 and 3-2 were loaded from disk.

Listing Available ISL Utilities

Example 3-2 demonstrates using the ISL LISTF command to display available ISL utilities. To generate a list of the utilities available on the boot medium, enter LISTF or LS at the ISL prompt.

```
ISL> LISTF

Utilities on this system are:


filename   type   start   size     created
=================================================
START      -12864 992896 27208   89/11/37 10:34:44
SAT        -12864 481344 25528   89/11/37 08:25:51
ISL        -12864 419936 152     89/11/37 08:25:27
DISCUTIL   -12864 463872 17464   89/11/37 08:25:36
DUMP       -12864 963904 16424   89/11/37 09:44:12
ISL        -12864 419936 152     89/11/37 08:25:27
A1002AI    -12864 480256 544     89/11/28 16:21:50
A1002AM    -12864 480800 408     89/11/28 16:21:51
A1002AP    -12864 481216 4600    89/11/28 16:21:54
A1100AI    -12864 485824 856     89/11/28 16:21:54
A1100AM    -12864 486688 496     89/11/28 16:21:55
A1100AP    -12864 487184 3400    89/11/28 16:21:58
EDBC       -12864 537024 2080    94/11/53 16:43:49
EDPROC     -12864 539104 8848    94/11/53 16:43:55
LASIDIAG   -12864 516688 752     94/11/53 16:43:56
LDIAG      -12864 517440 5808    94/11/53 16:44:00
MAPFILE    -12864 421600 16      94/11/53 16:44:00
MAPPER     -12864 523248 336     94/11/53 16:44:01
MDIAG      -12864 523584 6240    94/11/53 16:44:05
MEMTEST    -12864 421616 321     94/11/53 16:44:05
MPROC      -12864 447760 1408    94/11/53 16:44:07
ODE        -12864 421936 432     94/11/53 16:44:07
SYSLIB     -12864 422368 688     94/11/53 16:44:08
TDIAG      -12864 529824 7200    94/11/53 16:44:13
UNIPROC    -12864 453504 4464    94/11/53 16:44:16
BCDIAG     -12864 423056 960     94/11/53 16:44:17
CAEXR      -12864 444720 672     94/11/53 16:44:18
IOMAP      -12864 445392 1536    94/11/53 16:44:19
CLKUTIL    -12864 424016 312     94/11/53 16:44:20
SADPATCH   -12864 446928 832     94/11/53 16:44:20
```

Example 3-2. Listing Available ISL Utilities

Activating and Deactivating Autoboot and Autosearch Functions

Enabling and disabling the autoboot and autosearch flags determines one of four boot device and console selections for system initialization. Hardware interprets the selections as follows:

Manual (autoboot off and autosearch off). Ask for the path to the boot device. Use the path that is indicated. Initialize the path given, and boot from it.

Bootsearch (autoboot off and autosearch on). Search for a boot device. (Devices are searched from the smallest to the largest physical address on the processor's bus.) If the boot device has an incorrect data format, search for the next boot device. If no boot device exists, or all have the incorrect data format, execute manual selection.

Autoboot (autoboot on and autosearch off). Try to boot from the primary boot device specified in stable storage. If the boot device does not exist or has an incorrect data format, execute manual selection. Once booted, execute (performed by ISL) an autoboot file, which contains a command sequence, to bring up the operating system without operator intervention. If the autoboot file does not exist, prompt the operator for the utility command.

Autosearch (autoboot on and autosearch on). Try to boot from the boot device path stored in stable storage. If the boot device does not exist or has an incorrect data format, execute the boot search selection. Once booted, execute (performed by ISL) an autoboot file, which contains an autoboot sequence, to bring up the operating system without operator intervention. If the autoboot file does not exist, prompt the operator for the utility command.

To enable or disable these features, use the `AUTOBOOT` and `AUTOSEARCH` commands. Enter one or both of the commands and the desired setting (`ON/OFF`) at the ISL prompt. The system responds with a message indicating the flag status:

```
ISL> AUTOBOOT ON

  Autoboot is ON (enabled).

ISL> AUTOBOOT OFF

  Autoboot is OFF (disabled).

ISL> AUTOSEARCH ON

  Autosearch is ON (enabled).

ISL> AUTOSEARCH OFF
```

```
Autosearch is OFF (disabled).
```

For more information on the autoboot and autosearch flags, refer to Appendix C.

Modifying boot paths in stable storage

The ISL commands **PRIMPATH**, **ALTPATH**, and **CONSPATH** are available for placing new primary boot path, alternate boot path, or console boot path information in stable storage. The changes need to be in stable storage to execute the autoboot sequence properly in the event of a power outage or other serious failure.

Caution

The commands described in the above paragraph may disrupt normal system functions if used inappropriately. For this reason, do not attempt to use these commands without assistance from Hewlett-Packard service personnel.

To execute any of these three commands, enter the command with its appropriate parameter or enter Return after the command and wait to be prompted for further input:

```
ISL> ALTPATH 6/4.3.0
```

or

```
ISL> ALTPATH

Enter alternate boot path: 6/4.3.0
```

To withdraw a command (without changing the path), enter Return after entering the command without any parameter. For example,

```
ISL> ALTPATH

Enter alternate boot path:  Return
Invalid Input.
```

Trailing zeros are not required when a boot path is entered:

```
ISL> PRIMPATH 2/4.0.0
ISL> CONSPATH 2/4.1.0
```

If an improper path format is entered, or you have withdrawn a command as shown above, the system issues an **Invalid Input** message. Then ISL prompts for a new command:

```
ISL> PRIMPATH 240
Invalid Input.
```

Displaying current boot path, autoboot, and autosearch settings

Since an improper path keeps the system from booting, use the DISPLAY command to check the paths entered. Double check these entries against a recent I/O map from the ISL IOMAP utility or a configuration listing from the SYSGEN utility. For more information on SYSGEN, refer to Chapter 4.

The DISPLAY or DI command lists the autoboot and autosearch settings, the primary boot path, the alternate boot path, and the system console path held in stable storage. Use the DISPLAY command to verify that correct information resides in stable storage. Example 3-3 demonstrates using the ISL DISPLAY command. This is an example from a Series 949 system. The boot paths may vary, depending on the system.

```
ISL> DISPLAY

      Fastsize value is 0000000F

      Autoboot is ON (enabled)

      Autosearch is OFF (disabled)

      Primary boot path is 4.1.0.0.0.0.0
      Primary boot path is (hex) 4.1.0.0.0.0.0

      Alternate boot path is 4.5.0.0.0.0.0
      Alternate boot path is (hex) 4.5.0.0.0.0.0

      System console path is 4.2.0.0.0.0.0
      System console path is (hex) 4.2.0.0.0.0.0

      Last utility launched from ISL was START
ISL>
```

Example 3-3. Displaying an example of ISL Settings

Setting fastsize

If fastsize is set to the wrong value, you cannot do installs or updates. The only value that is acceptable is "F." If you try to do an update or install with fastsize set to the wrong value, you will receive an error message that reads UTILITY REQUIRES MORE MEMORY THAN IS CONFIGURED.

Consider the following example.

```
ISL> DISPLAY

Fastsize value is 00000003
:
```

This fastsize value is invalid. You must reset it to "F"; therefore, at the ISL prompt, enter **Fastsize F**, as in the following example.

```
ISL> FASTSIZE F
```

If you changed the value of fastsize, you must reset the system for the new value to take effect. For more information on resetting the system, refer to Chapter 2.

Listing autoboot file contents

To list the contents of the current autoboot file, enter either LISTAUTOFL or LSAUTOFL at the ISL prompt:

```
ISL> LISTAUTOFL
```

Reading Nonvolatile Memory (NVM)

Nonvolatile memory stores system activity parameters, including a circular queue of the last six ISL utilities executed. This information remains intact, even through system failures.

To read the contents of NVM, enter **READNVM** *nn* at the prompt, where *nn* is the location to be read:

```
ISL> READNVM 68

     Address 68 contains 0x32363334
```

For information on the contents and locations of NVM, refer to Appendix C.

Reading stable storage

Stable storage stores boot path information along with other critical system parameters. Like NVM, stable storage maintains its information through system crashes and failures. Unlike NVM, stable storage maintains its information even if the memory card, containing stable storage, is removed from the backplane.

To read the contents of stable storage, enter **READSS** *nn* at the prompt, where *nn* is the location to be read:

```
ISL> READSS 40

     Address 40 contains 0XFFFFFF08
```

For information on the contents and locations of stable storage, refer to Appendix C.

Reading and setting the hardware clock

The ISL utility CLKUTIL reads and sets the battery backed-up hardware clock. This clock maintains Greenwich Mean Time (GMT) independently of the software clock that is displayed when you enter the ISL START utility or any of the other ISL utilities that support the software clock. (Refer to example 3-7 for an example of the software clock interaction.). The CLKUTIL utility, therefore, reads the date and time that were previously set with CLKUTIL, but does not itself reflect the changes that you may make while in any other ISL utility.

The hardware clock should be set to GMT if the clock displays are to be correct on the booted system. The hardware clock provides the basis for time displays that are part of some ISL utilities.

When the local time is entered during particular ISL utilities, the system computes an offset and stores it in stable storage. During a boot, the GMT and this offset are combined to produce the local time, displayed on the console.

To read or set the hardware clock, enter:

```
ISL> CLKUTIL
```

The system responds with the following banner:

```
SYSTEM FOR ISL STAND ALONE UTILITIES. [IHO, SPU LAB]
Version 1.0

****** clock utility ************ ver 1.0 ***** 11/6/86
enter command :  (r) read clock, (s) set clock >
```

To read the clock, enter **r** at the CLKUTIL prompt:

```
enter command :  (r) read clock, (s) set clock > r
```

The system responds with a message similar to the following:

```
THU, JAN 1,  1988,  9:00:16 AM
```

To set the clock, enter **s** at the CLKUTIL prompt:

```
enter command :  (r) read clock, (s) set clock > s
```

The system responds with a message similar to the following:

```
enter date  mm/dd/yyyy
```

When the **enter date** prompt appears, enter the date in the correct format: **mm** is a two-digit number, 1-12, representing the month; **dd** is a two-digit number, 1-31, representing the day of the month; and **yyyy** is a four-digit number representing the year. (You can also enter just the last two digits for the year.)

The system continues by issuing the following prompt:

```
enter time hh:mm:ss
```

Enter the time using Greenwich Mean Time in 24-hour format.

The system requests verification of the adjusted date and time by issuing a message similar to the following:

```
THU, JAN 7, 1988, 11:17:00 PM
ok (y/n)?
```

Entering **Y** returns a message of:

```
clock set!
```

Entering **N** returns you to the **enter date** prompt.

Pressing [Return] at the **enter command** prompt returns you to the ISL prompt.

ISL Boot Utilities

The system uses bootable ISL utilities to either load the system from tape or to start the system from disk. The current boot utilities are **START**, **UPDATE**, **INSTALL**, and **DUMP**. There are additional utilities for system management: **SADPATCH**, **DISCUTIL**, **CLKUTIL**, **SAT**, **CAEXR**, and **IOMAP**.

The **START** utility starts the system from disk. Use this utility to recover from a system hang or failure or to reboot the system after scheduled downtime.

Bringing in the system from tape is referred to as a system load. The system uses two utilities to perform a system load, which builds essential operating system files and data structures on disk. The two load utilities, **UPDATE** and **INSTALL**, have the option to boot the system from disk once the load operation is complete.

The **INSTALL** utility completely replaces the contents of the disk and places the base operating system files, including the system configuration files, on disk. If you have installed a new system over an already existing system, you can use the **STORE/RESTORE** utility to restore the original system dictionary, other subsystem files, and user files to the new system after the **INSTALL** is complete.

The **UPDATE** utility replaces the current base system files on disk and optionally replaces system configuration files (if you name a different configuration file when you use the **UPDATE** utility). If you do not name another configuration file, the original file will remain after the update.

The base system files contain the copy of the operating system to be placed on disk. As part of every system, these files make a minimal or base system. **INSTALL** and **UPDATE** utilities, optionally, attempt a software reboot from disk.

The **DUMP** utility writes the current state of the system main memory and secondary storage to tape for analysis. **DUMP**, also optionally, attempts a software reboot from disk.

Depending on the utility and the options specified, the system either halts at the end of the utility's execution or reboots from disk.

If you want to see a list of command options along with an explanation of correct usage and default values, enter **help** at the ISL prompt.

Starting the System

This section discusses using the initial system loader utility, START, that activates the operating system.

START is the ISL utility used most often, whether to boot the system from disk after a reset, to automatically reboot after the completion of the UPDATE, INSTALL, or DUMP utility, or to bring up the operating system after a shutdown.

START execution differs depending on the previously executed boot command. For example, a START after an INSTALL executes differently than a START after a shutdown or reset. START after an INSTALL may initialize the system member volumes. A START option after an INSTALL or UPDATE does not restart jobs.

There are, primarily, six load and start utilities for the operating system.

- START or START RECOVERY
- START NORECOVERY
- UPDATE or UPDATE NOCONFIG
- UPDATE CONFIG
- INSTALL
- DUMP

Using START and its options

The ISL command for the START utility is START. The utility has several options:

```
START [;GROUP=cgn][;LOGON=acct] [{;RECOVERY   }]
                                [{;NORECOVERY }]

[{;SINGLE-DISC}] [{;SINGLE-USER}]
[{;MULTI-DISC }] [{;MULTI-USER }]

[{;SYSSTART   }]
[{;NOSYSSTART }]
```

Specify START alone or with alternate options. Separate the options from the command and other options with a blank or semicolon.

Using the ISL START command without listing any options:

```
ISL> START
```

is the same as specifying the following default options:

```
ISL> START GROUP=CONFIG LOGON=OPERATOR.SYS RECOVERY&

MULTI-USER MULTI-DISC SYSSTART
```

These default options instruct the system to boot from disk, to use the configuration information last used to boot the system, attempts to log on as OPERATOR.SYS (if the OPERATOR user has been created), to restart all jobs and allow all users access to the system, to bring up all volumes present on the system, and to execute commands found in the SYSSTART file, SYSSTART.PUB.SYS.

Enter an alternate option through a keyword parameter, or several alternate options in groups of keyword parameters. The following command line shows an example of using multiple alternate options:

```
ISL> START GROUP=CONFG950 LOGON=JOHN.SMITH NORECOVERY&
     SINGLE-USER SINGLE-DISC
```

Executing commands during system startup

The file SYSSTART.PUB.SYS executes automatically at system startup if the SYSSTART parameter is specified in the START command. This file can be used to set up the normal user environment automatically when the system starts up. The contents of this file should include command parameters appropriate for your environment, such as the standard limits for jobs and sessions, spooler start commands, stream device identification, outfence priorities, event logging, and so on. These commands are then performed automatically for you whenever the system is restarted.

A SYSSTART file can contain selected MPE commands (and their parameters) that the system manager is allowed to execute except networking commands. (Networking commands should be executed from a job that is streamed from SYSSTART, or from a logon UDC for OPERATOR.SYS.) You can use the following commands in a SYSSTART file:

ACCEPT	HEADOFF	REFUSE
ALLOCATE	HEADON	STARTSESS
ALLOW	JOBFENCE	STARTSPOOL
ALTLOG	JOBPRI	STOPSPOOL
COMMENT	JOBSECURITY	STREAM
CONSOLE	LDISMOUNT	STREAMS
DEALLOCATE	LIMIT	SUSPENDSPOOL
DISALLOW	LMOUNT	TELL
DISCRPS	LOG	TELLOP
DOWN	MRJECONTROL	TUNE
DOWNLOAD	OUTFENCE	UP
		VMOUNT

Create a SYSSTART file with any text editor. A properly formatted SYSSTART file is composed of five modules, labeled and placed in the following order: startup, warmstart, coolstart, update, and reload. Notice that each module must be separated by one or more asterisks.

The following SYSSTART file sample is an example of the type of commands you might want to include in a SYSSTART file. It is not intended to suggest entries for your system's SYSSTART file.

```
STARTUP
STREAMS 10
ALLOW @.@;COMMANDS=REPLY
ALLOCATE COBOLII.PUB.SYS
LIMIT 8,16
JOBFENCE 6
OUTFENCE 6
OUTFENCE 12;LDEV=14
FILE T;DEV=TAPE
***
WARMSTART
STREAMS 10
ALLOW @.@;COMMANDS=REPLY
ALLOCATE COBOLII.PUB.SYS
LIMIT 8,16
JOBFENCE 6
OUTFENCE 6
OUTFENCE 12;LDEV=14
FILE T;DEV=TAPE
***
COOLSTART
STREAMS 10
ALLOW @.@;COMMANDS=REPLY
ALLOCATE COBOLII.PUB.SYS
LIMIT 8,16
JOBFENCE 6
OUTFENCE 6
OUTFENCE 12;LDEV=14
FILE T;DEV=TAPE
***
UPDATE
LIMIT 1,1
JOBFENCE 14
OUTFENCE 14
STARTSESS 20;MANAGER.SYS/PASSWORD;HIPRI;NOWAIT
***
RELOAD
LIMIT 1,1
JOBFENCE 14
OUTFENCE 14
STARTSESS 20;MANAGER.SYS/PASSWORD;HIPRI;NOWAIT
```

Example 3-4. A Properly Formatted SYSSTART File

The STARTUP module is executed whenever the SYSSTART file is accessed. Place commands and parameters specific to an operation under the appropriate heading. If, for instance, you do not wish users to be able to log on immediately following an UPDATE (START) or INSTALL (START), insert commands in the update and install modules to limit the jobs and sessions and raise the jobfence. Table 3-2 describes how each module is executed.

Table 3-2. Execution of SYSSTART File Modules

Boot Utility Used	SYSSTART Module Executed
ANY	startup
START (RECOVERY)	warmstart
START (NORECOVERY)	coolstart
UPDATE (START)	update
INSTALL (START)	reload

The SYSSTART file must be created by MANAGER.SYS and needs to reside on LDEV 1 to function properly. Once the file is created, use the following commands to copy the file to the appropriate location:

```
HELLO MANAGER.SYS
FILE SYSSTART;LDEV=1
FCOPY FROM=tempfilename;TO=*SYSSTART;NEW
```

If an error exists in the SYSSTART file, the startup process ignores it and continues execution.

Starting a 900 Series HP 3000

The following steps comprise a procedure for booting MPE/iX on a 900 Series HP 3000 computer system using START following a reset.

To start the system, perform the following steps:

1. Power on all attached peripheral devices, and ensure that the system disks are powered on.
2. Place the console in control mode. Enter:

   CTRL B

   The console control mode prompt (CM>) should appear on the console screen.
3. Reset the system using AP commands, boot from the primary path, and enter the START command at the ISL prompt.

   /need begin>

Note If you have a 99X system, you must transfer to the service processor before you reset the system.

```
CM> SP
```

Examples 3-5 and 3-6 demonstrate the messages received at the console of the 900 Series systems.

Note The components of the system startup messages on all of the systems are similar; however, the messages can vary in I/O path descriptions depending on the system.

```
CM> RS

Execution of this command irrecoverably halts all system processing
and I/O activity and restarts the computer system.

Type Y to confirm your intention to restart the system (Y/N): Y
SPU hardware was successfully reset.  (APMSG 02)

Processor Dependent Code (PDC) revision 3.2

Console path = 4.2.0.0.0.0.0
Primary boot path = 4.1.0.0.0.0.0
Alternate boot path = 4.5.3.0.0.0.0

Enter boot path, command, or ?> 4.1

Booting.

Console IO Dependent Code (IODC) Revision   4
Boot    IO Dependent Code (IODC) Revision   4

Interact with IPL (Y or N)?> Y

HARD Booted.

MMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.28 July 15, 1993

ISL> START
MPE/iX launch facility
Initialize_genesis - Version : <<870204.1552>>
TUE, JUN 27, 1990,  4:15:24 AM (y/n)? Y
[TMUX_DAM] 15 7 12 14
Initialize genesis completed.
Create Console Messages kso completed.
Initialize memory manager completed.
Initialize resident kernel completed.
```

Example 3-5. Example of a Hard Reset from a Series 935 System

```
Initialize volume management and mount the System Disk
Initialize volume management completed.
Opening the native system library completed
Initialize loader completed.
I/O boot path managers frozen in memory completed.
Vsm make no longer resident completed.
Initialize process management completed.
Initialize debug subsystem completed.
Initialize file system completed.
Initialize temporary UID/GID Databases completed.
Initialize non-resident services completed.
Begin binding compatibility mode SL
Compatibility mode SL binding complete
Create port process has been completed.

The following is a list of the boot options -
   last boot command:    START      last configuration group:    CONFIG
   current boot command START       current configuration group: CONFIG
   last configuration group actually used by START: CONFIG
   logon = OPERATOR.SYS
   RECOVERY                         MULTI-USER
   MULTI-DISK                       SYSSTART

Begin launching additional processors:
                .
                .
                .
Entering - System I/O configuration.
The path 4 has already been configured.
The path 4.1 has already been configured.
The path 4.1.0 has already been configured.
The path 4.2 has already been configured.
The path 4.2.0 has already been configured.
The path 4.5.3 was configured but is not available.
The path 4.5.4 was configured but is not available.
The path 4.5.5 was configured but is not available.
The path 4.5.6 was configured but is not available.
The path 4.6.0 was configured but is not available.
The path 4.6.5 was configured but is not available.
The path 4.6.6 was configured but is not available.
The path 4.6.7 was configured but is not available.
Leaving -  System I/O configuration.
```

Example 3-5. Example of a Hard Reset from a Series 935 System (continued)

```
                    SYSTEM I/O AT BOOT TIME

ldev:   1   HP7937H  configured      available  4.1.0
ldev:   2   HP7937H  configured      available  4.1.1
ldev:   3   HP7937H  configured      available  4.1.3
ldev:   4   HP7937H  configured      available  4.1.4
ldev:   5   HP7937H  configured  not-available  4.6.5
ldev:   6   HP2566A  configured      available  4.5.7
ldev:   7   HP7980A  configured      available  4.5.0
ldev:  10   HP7980A  configured  not-available  4.5.3
ldev:  19   HP2680A  configured  not-available  4.5.5
ldev:  20   HP2392A  configured      available  4.2.0
ldev:  28   HP2688A  configured  not-available  4.5.6
ldev:  29   HP2688A  configured  not-available  4.5.4

MEMORY AVAILABLE FOR USE (bytes): 3554432

Entering - Mount all volumes
Mounting MASTER on LDEV          1
Mounting MEMBER on LDEV          2
Mounting MEMBER on LDEV          3
Mounting MEMBER on LDEV          4

START AGGREGRATE RECOVERY of MPEXL_SYSTEM_VOLUME_SET
SYSTEM RECOVERY COMPLETED for    MPEXL_SYSTEM_VOLUME_SET
USERLOG RECOVERY COMPLETED for    MPEXL_SYSTEM_VOLUME_SET
NO PARALLEL PROCESSES FOR MOUNT_ALL_VOLUMES
-- Time spent in MOUNT_ALL_VOLUMES         15
Leaving - Mount all volumes
The current boot command has been saved on the system master.
NMLG FILE NUMBER 20 ON.
14:04/23/DCC STARTUP - ENTER - version C0104504 compiled 930712
14:04/23/ WARNING: I/O config from last START RECOVERY will be used (DCCWARN
=100)
[NETWORK_DUMP_SURR] Version A.00.47.03A
14:04/23/DCC STARTUP - OK
14:05/40/NRJE CANNOT CONFIGURE LDEV 12 INTO THE I/O SYSTEM
14:05/40/40DEVICE IS ALREADY CONFIGURED
14:05/40/NRJE CANNOT CONFIGURE VIRTUAL READER FOR WSID: R20
System State: Initializing Mode.
Reply Information Table has been initialized!
System State: Multiuser Mode.
14:05/1/Spooling of initally spooled devices is complete.
14:05/1/Set-up of Spooling Subsystem is complete.
Initializing Job & Session
Startup processing has begun.
```

Example 3-5. Example of a Hard Reset from a Series 935 System (continued)

```
============================================================
              STARTUP startup block processing
============================================================
SESSION Scheduling Initialized
ALLOW @.@;COMMANDS=LOG
JOB Scheduling Initialized
limit 10,60
jobfence 7
startspool lp
streams 10
outfence 7
NETCONTROL START;NET=LAN1;override
16:52/38/Output spooler, LDEV #6:  The File System reported
 a warning while acquiring
the spooled device.  The spooler will continue.
16:52/38/Output spooler, LDEV #6:  Started.
NSCONTROL START;override
NSSTATL NETWORK SERVICE STARTED.
NSSTAT NETWORK SERVICE STARTED.
HCS NETWORK SERVICE STARTED.
HDSPNS NETWORK SERVICE STARTED.
PDS NETWORK SERVICE STARTED.
LOOPBACK NETWORK SERVICE STARTED.
RPML NETWORK SERVICE STARTED.
RPM NETWORK SERVICE STARTED.
PTOPL NETWORK SERVICE STARTED.
PTOP NETWORK SERVICE STARTED.
RFAL NETWORK SERVICE STARTED.
RFA NETWORK SERVICE STARTED.
NFTL NETWORK SERVICE STARTED.
NFT NETWORK SERVICE STARTED.
VTRL NETWORK SERVICE STARTED.
VTR NETWORK SERVICE STARTED.
VTL NETWORK SERVICE STARTED.
VT NETWORK SERVICE STARTED.
Startup processing is complete.

Initiate Operator Log On
Successfully launched diagnostic monitor process.
Warning - Protection of the system file
 'AUTOBOOT.MPEXL.SYS', failed.

16:54/36/INVALID PASSWORD FOR "OPERATOR.SYS,OPS" DURING
 LOGON ON LDEV #20. (js 65)
ENTER ACCOUNT PASSWORD:
MPE XL:
```

Example 3-5. Example of a Hard Reset on a Series 935 System (continued)

```
CM> TC

Processor Dependent Code (PDC) revision 3.2

Console path         = 2/4.1.0.0.0.0.0
Primary boot path    = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.

Soft Booted--memory state is valid

Autoboot from primary path enabled.
To override, press any key within 10 seconds.

10 seconds expired--proceeding with autoboot


Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Booted.
MMSAVE Version 2.2
DUMPAREA protected, proceeding to ISL without memsave
ISL loaded

ISL Revision A.00.28 July 15, 1993

    Cannot find an auto-execute file.  AUTOBOOT ABORTED.

ISL> START


MPE/iX launch facility
Initialize_genesis - Version : <<870204.1552>>

THU, MAY 24, 1990,  4:28:32 PM (y/n)?
```

Example 3-6. Example of a Soft Reset on a Series 950 System

```
[TMUX_DAM] 15 7 12 14
Initialize genesis completed.
Create Console Messages kso completed.
Initialize memory manager completed.
Initialize resident kernel completed.
beginning recovery
setup complete - beginning recovery of free space map and
 label table
completed recovery of free space map and label table
completed recovery of files
begin posting of recovered files
recovery completed
NEW and TEMP files deallocated for
 MPEXL_SYSTEM_VOLUME_SET:MEMBER1 LDEV1
Initialize volume management completed.
Opening the native system library completed.
Initialize process management completed.
Initialize debug subsystem completed.
Initialize file system completed.
Initialize loader completed.
Initialize non-resident services completed.
Begin binding compatibility mode SL
Compatibility mode SL binding complete
Create port process has been completed.
    Warning  - Protection of the system file
 'AUTOBOOT.MPEXL.SYS', failed
Protection of system files has been completed.

The following is a list of the boot options -
   last boot command:    INSTALL    last configuration group:    CONFIG
   current boot command: START      current configuration group: CONFIG
   logon = OPERATOR.SYS
   NORECOVERY                           MULTI-USER
   MULTI-DISK                           SYSSTART

Entering - System I/O configuration.
The path 2 has already been configured.
The path 2/4 has already been configured.
The path 2/4.0 has already been configured.
The path 2/4.0.0 has already been configured.
The path 2/4.0.2 was configured but is not available.
The path 2/4.1 has already been configured.
The path 2/4.1.0 has already been configured.
The path 2/4.3.0 was configured but is not available.
The path 2/4.3.4 was configured but is not available.
The path 2/4.3.5 was configured but is not available.
```

Example 3-6. Example of a Soft Reset on a Series 980 System (continued)

```
The path 2/8.0.0 was configured but is not available.
The path 2/8.0.1 was configured but is not available.
The path 2/8.0.2 was configured but is not available.
The path 2/8.0.3 was configured but is not available.
The path 2/8.1.0 was configured but is not available.
The path 2/8.1.1 was configured but is not available.
The path 2/8.1.2 was configured but is not available.
The path 2/8.1.3 was configured but is not available.
The path 6/4.0.0 was configured but is not available.
The path 6/4.0.1 was configured but is not available.
The path 6/4.0.2 was configured but is not available.
The path 6/4.3.4 was configured but is not available.
The path 6/4.3.5 was configured but is not available.
The path 6/4.3.7 was configured but is not available.
Leaving -  System I/O configuration.


                        SYSTEM I/O AT BOOT TIME

ldev:    1   HP7937H  configured      available  2/4.0.0
ldev:    2   HP7937H  configured      available  2/4.0.1
ldev:    3   HP7933H  configured  not-available  2/4.0.2
ldev:    6   HP2567A  configured      available  6/4.3.6
ldev:    7   HP7980A  configured      available  6/4.3.0
ldev:    8   HP7978B  configured  not-available  2/4.3.0
ldev:   10   HP7980A  configured  not-available  6/4.3.7
ldev:   19   HP2680A  configured  not-available  6/4.3.4
ldev:   20   HP2392A  configured      available  2/4.1.0
ldev:   21   HP7937H  configured  not-available  6/4.0.0
ldev:   22   HP7937H  configured  not-available  6/4.0.1
ldev:   23   HP7937H  configured  not-available  6/4.0.2
ldev:   25   HP7937H  configured  not-available  2/8.0.0
ldev:   26   HP7937H  configured  not-available  2/8.0.1
ldev:   27   HP7933H  configured  not-available  2/8.0.2
ldev:   28   HP7933H  configured  not-available  2/8.0.3
ldev:   29   HP2688A  configured  not-available  6/4.3.5
ldev:   30   HP2688A  configured  not-available  2/4.3.4
ldev:   31   HP7937H  configured  not-available  2/8.1.0
ldev:   32   HP7937H  configured  not-available  2/8.1.1
ldev:   33   HP7935H  configured  not-available  2/8.1.2
ldev:   34   HP7935H  configured  not-available  2/8.1.3
ldev:   39   HP2688A  configured  not-available  2/4.3.5

   MEMORY AVAILABLE FOR USE (bytes)    : 33554432
```

Example 3-6. Example of a Soft Reset on a Series 980 System (continued)

```
Entering - Initialize system member volumes
Leaving -  Initialize system member volumes
Entering - Mount all volumes

VOLUME ALREADY MOUNTED ON LDEV 1 (AVR 10)
   A volume has been mounted on ldev 1

LONER VOLUME MOUNTED ON LDEV 2 (AVR 11)
   A volume has been mounted on ldev 2


    Warning     - Volume is not available for mounting.  The ldev is 3
    Warning     - Volume is not available for mounting.  The ldev is 25
    Warning     - Volume is not available for mounting.  The ldev is 26
    Warning     - Volume is not available for mounting.  The ldev is 27
    Warning     - Volume is not available for mounting.  The ldev is 28
    Warning     - Volume is not available for mounting.  The ldev is 31
    Warning     - Volume is not available for mounting.  The ldev is 32
    Warning     - Volume is not available for mounting.  The ldev is 33
    Warning     - Volume is not available for mounting.  The ldev is 34
    Warning     - Volume is not available for mounting.  The ldev is 21
    Warning     - Volume is not available for mounting.  The ldev is 22
    Warning     - Volume is not available for mounting.  The ldev is 23
Leaving -  Mount all volumes
The current boot command has been saved on the system master.
NMLG FILE NUMBER 0 ON.
[PSI_DUMP_SURR] Version A.00.01.026
16:30/11/DCC STARTUP - ENTER - version C0005105 compiled 880322
16:30/11/DCC warning  128-1, (Startup) can not open NMCONFIG,
  status  FF09008F.
16:30/18/DCC ERROR  14-1, Configuration file open error  001000B4.
16:30/11/DCC STARTUP - ERROR
System State:  Initializing Mode.
Reply Information Table has been initialized!
System State:  Multiuser Mode.
SYSTEM LOG FILE #1 IS ON
Initializing Job & Session
Initiate Operator Log On
SESSION Scheduling Initialized
JOB Scheduling Initialized
Successfully launched diagnostic monitor process.
ACCT EXISTS, USER NAME DOESN'T.  (CIERR 1438)
16:31/24/MISSING USER NAME DURING LOGON ON LDEV #20. (js 11)
MPE XL:
```

Example 3-6. Example of a Soft Reset on a Series 980 System (continued)

Updating the Operating System

This section provides general information on using the MPE/iX and initial system loader (ISL) commands, options, and utilities to update the operating system of a 900 Series HP 3000.

Caution

Specific update and installation instructions are subject to change. This manual provides you with an overview of the procedures involved.

For more specific information on using MPE/iX and initial system loader (ISL) commands, options, and utilities to update your operating system for a particular new release, refer to the appropriate version of *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001). This manual is included with the software tapes for each new release and contains information specific for that release.

The ISL utility

The ISL utility `UPDATE` is more commonly used than `INSTALL`. The `UPDATE` utility replaces the base system files on the system disk with those from a boot tape. Optionally, you can update the configuration data files in the group `CONFIG.SYS`.

Before any other files are restored, `UPDATE` verifies that the system disk is a valid main system disk. If not, `UPDATE` halts with an error message.

The `UPDATE` utility is primarily used to replace a current version of the operating system with another version, but you can also use the `UPDATE` utility to aid in recovering from a severe system failure.

If your system fails, you have many options to use to help recover your system. Use `UPDATE` as a recovery method only after doing the following:

- attempting a `START RECOVERY`
- attempting a `START NORECOVERY`
- ensuring the validity of your `START` procedure
- ensuring that your hardware, hardware code, and current software are functioning properly

Caution

Do not attempt to use `UPDATE` to restore your system without reading the Backdating Your System appendix in *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001).

Scheduling a System Update

If you are using the UPDATE facility as a recovery method, the opportunity to schedule your system's UPDATE is probably not available to you. Take time to thoroughly examine the UPDATE process before using it as a recovery method. Understanding the UPDATE process can reduce system operator and system manager errors and, therefore, reduce your system's downtime.

If you are using the UPDATE utility to replace a current version of the operating system with a newer version, schedule the update for off-peak hours. The update procedure can take up to four hours, depending on the system and the number of subsystem products you have purchased. To reduce the time involved in ensuring the integrity of your backups, schedule the UPDATE immediately after a full system backup.

Using the UPDATE utility and options

The command to invoke the UPDATE utility is UPDATE. The utility has two initial options, CONFIG/NOCONFIG and START/NOSTART, with additional options if START is selected:

```
UPDATE [ { ;CONFIG   } ] [ { ;START   } [options] ]
       [ { ;NOCONFIG } ] [ { ;NOSTART }           ]

where options are:  [;LOGON=acct] [GROUP=cgn]
[ { ;SINGLE-DISC } ] [ { ;SINGLE-USER } ]
[ { ;MULTI-DISC  } ] [ { ;MULTI-USER  } ]

[ { ;SYSSTART   } ]
[ { ;NOSYSSTART } ]
```

- The CONFIG/NOCONFIG option allows you to indicate whether you wish to replace the configuration files in the group CONFIG.SYS on disk with any that may exist in the group CONFIG.SYS on the tape. (The CONFIG.SYS group on a factory tape is empty; however, a customer-generated tape may contain configuration data.)
- The START/NOSTART option allows you to choose whether or not to autoboot once the update is complete. If you specify START as an option, or accept it as the default, the remaining START options become available.

Refer to table 3-4 for more information on the START options available for an update. Enter the options in any order, and separate them from the command and other options by a blank or semicolon.

Entering the command UPDATE without listing any options

```
ISL> UPDATE
```

is the same as specifying the following default options:

```
ISL> UPDATE NOCONFIG START GROUP=CONFIG LOGON=&

OPERATOR.SYS MULTI-DISC MULTI-USER SYSSTART
```

The UPDATE utility with its default options instructs the system to perform these tasks:

- update the existing operating system without replacing the configuration data files on disk
- autoboot the system from disk after the update is completed
- use the configuration group CONFIG.SYS
- attempt to log on in the user account OPERATOR.SYS (if there is no OPERATOR.SYS user, you will see the MPE prompt)
- bring up all volumes present on the system.
- allow access to all mounted volumes by all users
- execute the commands in the system startup file, SYSSTART.PUB.SYS, if it is present

Restarting of jobs is not permitted after either an UPDATE or an INSTALL, because no jobs exist after an UPDATE or an INSTALL.

Updating the operating system: a preview

Note

Each customer installation or update is somewhat different. Examine the processes described for areas you may need to customize to fit your system. The following Hewlett-Packard publications will prove useful for updating your system:

- *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001)
- *MPE/iX Commands Reference Manual Volumes 1 and 2* (32650-90003 and 32650-90364)
- *Configuring Systems for Terminals, Printers, and Other Serial Devices* (32022-61000)
- *HP 3000/iX Network Planning and Configuration Guide* (36922-61023)

Booting the system to MPE/iX using the UPDATE utility may involve preliminary steps depending upon the particulars of your system and its usage.

Some of the preliminary steps are listed below:

1. backing up system data
2. limiting system use
3. deactivating network services
4. renaming any system files you wish to maintain
5. reserving adequate disk space

Once you are ready to begin the operating system update, the following are required steps of the process:

6. updating from the system load tape
7. restoring the FOS tape
8. restoring the SUBSYS tape
9. creating a customized system load tape
10. updating with the customized system load tape
11. returning to normal operation

Updating the system configuration: a preview

If you are updating just the configuration of your system and not the operating system, then you have already created the customized SLT, as in step 9 above. You did this when you made your configuration changes in SYSGEN and did a **KEEP**. This information was transferred to the CSLT at the end of the update process. The following steps are a subset of an operating system update:

1. backing up system data
2. limiting system use
3. deactivating network services
4. renaming any system files you wish to maintain

Once you are ready to begin the configuration update, the following are required steps of the process:

5. updating with the customized system load tape
6. returning to normal operation

Updating to recover from system failure: a preview

If your system fails, you have many options to use to help recover your system. Use the **UPDATE** utility as a recovery method only after doing the following:

1. attempting a START RECOVERY
2. attempting a START NORECOVERY
3. ensuring the validity of your START procedure
4. ensuring your hardware, hardware code, and current software are functioning properly
5. reserving adequate disk space

Once you are ready to begin the recovery update, the following are required steps of the process. These steps are a subset of an operating system update.

6. updating with the customized system load tape
7. restoring the backup tapes
8. returning to normal operation

Caution

Do not attempt to use **UPDATE** to restore your system without reading the Backdating Your System appendix in *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001).

Backing up the system and retaining the current configuration

Before updating your system, ensure that you have complete backup tapes. If up-to-date backups do not exist, reschedule the update. The backups provide a method of restoring your data if difficulties arise during the update.

You should also retain a hard copy of your system's current configuration. If you use the CONFIG option with **UPDATE**, **UPDATE** replaces the configuration files in the group **CONFIG.SYS** on disk with any that may exist in the **CONFIG.SYS** on the system load tape (SLT). If you use this option, you can unintentionally replace your system's current configuration files with the ones that **UPDATE** provides. In the event of an unintended replacement, if you have a listing of your current configuration, you can easily regenerate your system's current configuration.

Use SYSGEN to generate current configuration listings. For information on using SYSGEN, refer to Chapter 4.

The above information has provided you with an overview of the update process. If you are planning to update your system, please follow the instructions in the *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001) which came with the system tapes.

Installing the Operating System

This section provides a general overview on using operating system and initial system loader (ISL) commands, options, and utilities to install the operating system of a 900 Series HP 3000 system.

Caution

Specific update and installation instructions are subject to change. This section provides you with an overview of the procedures involved. *Do not* use these instructions to update your system.

For specific information on using operating system and initial system loader (ISL) commands, options, and utilities to install your operating system using new factory release tapes, refer to the appropriate version of *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001). This manual is included with the software tapes for each new release and contains information specific for that release.

The **INSTALL** utility replaces all files on the system disk with files from the boot tape. These files include the disk logical interface format (LIF) label and directory, the system volume label, the bad

sector table, the disk free space map, the system directory (null directory), boot files, and all base system files.

The INSTALL utility builds a null system directory that contains the account SYS. The groups CONFIG, DIAG, MPEXL, and the default configuration groups are added by the INSTALL utility later.

Installing a new version of the operating system can be accomplished by the system manager, except where specially customized software is to be installed. In this case, installation requires a Hewlett-Packard Service Representative.

After completion, the default option (INSTALL START) boots the system from disk.

The INSTALL utility is primarily used to do a first-time installation of the MPE/iX operating system. If you are installing a new release, be sure to follow the exact directions provided in the *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001).

The INSTALL utility can also be used to replace current versions of the operating system, boot files, and base system files. Finally, the INSTALL utility can be used as a last resort in system recovery to reload the software.

This section begins with a description of using the INSTALL utility to recover a lost system. The remaining sections provide information on doing a first-time installation or a reinstallation when the system was previously in use.

Using the INSTALL utility to recover a lost system

If your system fails, you have many options to use to help recover your system. Use the INSTALL utility as a recovery method only after doing the following:

- attempting a START RECOVERY
- attempting a START NORECOVERY
- ensuring the validity of your START procedure
- ensuring that your hardware and hardware code, and current software are functioning properly
- attempting an update

In the event of a major system failure caused by corrupted files or other possible causes, you can use the INSTALL utility to reload your system. In this procedure, the system is recovered through the use of backup tapes. You use a system load tape created as part of your system backup procedure. Alternately, you may instead use the SLT that the AUTOINST program created when the system was last installed or updated.

Note

Do not use these intructions to install your system. They are an overview only, and not a complete listing of tasks. Please refer to the *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001) for full instructions on installing the system.

The following is an overview of the steps to perform.:

- Install from the backup or **AUTOINST**-created SLT and start the system.
- Use **VOLUTIL** to initialize additional system volumes (if any).
- Restore the latest partial and full backup tapes.
- Shut down the system with the **SHUTDOWN** command, and reboot the system with **START NORECOVERY**.

The reinstallation process is now complete.

Scheduling an INSTALL

If you are using the **INSTALL** utility as a recovery method, the opportunity to schedule your system's installation is probably not available to you. Take time to thoroughly examine the **INSTALL** process before using it as a recovery method. Understanding the **INSTALL** process can reduce system operator and system manager error and, therefore, reduce your system's downtime.

Normal operating system replacement should be scheduled for off-peak hours. The **INSTALL** procedure can take up to five hours, depending on your system and the number of subsystems you have purchased. Schedule the installation immediately after a full backup, if you are not doing a first-time installation.

Using the INSTALL utility and options

The command to invoke the **INSTALL** utility is **INSTALL**. The utility has one initial option, **START/NOSTART**, with additional options if **START** is selected.

```
INSTALL [ { ;START   } [options] ]
        [ { ;NOSTART }           ]

where options are:  START [;GROUP=cgn] [LOGON=acct]

[ { ;SINGLE-DISC } ]  [ { ;SINGLE-USER } ]
[ { ;MULTI-DISC  } ]  [ { ;MULTI-USER  } ]
[ { ;SYSSTART    } ]
[ { ;NOSYSSTART  } ]
```

To use **INSTALL**, enter the **INSTALL** command with or without **START/NOSTART** and its options. Separate options from the **INSTALL** command and other options with a space or semicolon.

Entering the command **INSTALL** at the ISL prompt without listing any options:

```
ISL> INSTALL
```

is the same as specifying the following default options:

```
ISL> INSTALL START GROUP=CONFIG LOGON=OPERATOR.&
                SYS MULTI-DISC MULTI-USER SYSSTART
```

The INSTALL process with its default options instructs the system to perform the following tasks if an autoboot file exists, the autoboot file is enabled, and the **START** option is specified:

- Install the operating system, and autoboot the system from disk after the installation is completed.
- Use the configuration group, **CONFIG.SYS**.
- Attempt to log on in the user account **OPERATOR.SYS** (if there is no OPERATOR.SYS user, you will see the MPE prompt)
- Bring up all volumes present on the system.
- Allow access to all mounted volumes by all users.
- Execute the commands in the system startup file, **SYSSTART.PUB.SYS**, if it is present.

Installing the operating system: a preview

Booting the system to MPE/iX by using the **INSTALL** utility may involve preliminary steps if your system has previously been in use. When installing a system for the first time, you do not need to be concerned with these preliminary steps discussed below.

Some of the preliminary steps include the following:

- Backing up system data.
- Removing users and jobs from the system.
- Storing to tape any system files that you wish to maintain.

Once you are ready to begin the installation proper, the following are required steps of the process:

- installing from the system load tape
- restoring the FOS tape
- restoring the SUBSYS tape
- creating a customized system load tape
- updating with the customized system load tape
- restoring user files, if any
- starting system for normal operation

Note

Each customer installation is somewhat different. Examine the processes described for areas you may need to customize to fit your system. The following Hewlett-Packard publications will prove useful for updating your system:

- *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001)
- *MPE/iX Commands Reference Manual Volumes 1 and 2* (32650-90003 and 32650-90364)
- *Configuring Systems for Terminals, Printers, and Other Serial Devices* (32022-61000)
- *HP 3000/iX Network Planning and Configuration Guide* (36922-61023)

Back up the system and retain the current configuration

If you are installing over an existing system, ensure that it has been thoroughly backed up. If up-to-date backups do not exist, reschedule the installation. The backups provide a method of restoring your data. Please refer to the *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001) if you need additional information on backing up your system.

You should also retain a hard copy of your system's current configuration. If you have a listing of your current configuration, you can easily regenerate your system's current configuration, if necessary. A customer-generated tape may contain configuration data in the `CONFIG.SYS` group.

Use SYSGEN to modify the sample configuration file you used when you started the system from the disk. For information on using SYSGEN, refer to Chapter 4 through Chapter 8.

Note

Do not use these instructions to install your system. This information is only an overview. Please refer to the *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001) for complete installation information.

Dumping System Memory and Secondary Storage

This section dicusses using MPE/iX and initial system loader commands, options, and utilities to dump system memory and secondary storage to tape.

What is the function of the DUMP utility?

The `DUMP` utility saves the current state of the system's main memory and secondary storage to tape for later analysis. Perform a memory dump after a system failure or hang, for a recurring system problem, or when the system fails to boot properly. Have the tape analyzed by your Hewlett-Packard Representative or your Hewlett-Packard Response Center.

Using the DUMP utility and options

The DUMP utility has one basic option, SUBSET=ALL/MEMORY. Because START/NOSTART are also options, DUMP can use several START command options:

```
DUMP [SUBSET= {ALL   }] [{;START  }[options]]
              {MEMORY}  {;NOSTART}
```

Where options are:

```
[{;RECOVERY  }] [{;SINGLE-DISC}]
 {;NORECOVERY}  {;MULTI-DISC  }

[{;SINGLE-USER}] [{;SYSSTART  }]
 {;MULTI-USER }  {;NOSYSSTART}
```

To perform a complete memory dump, enter the DUMP command. The SUBSET=ALL option is the default option and dumps both main and virtual memory. The SUBSET=MEMORY option is required to dump main memory contents only.

Issuing the command DUMP without any options

```
ISL> DUMP
```

is the same as specifying the following default options:

```
ISL> DUMP GROUP=CONFIG LOGON=OPERATOR.SYS MULTI-DISC &
MULTI-USER RECOVERY START SUBSET=ALL SYSSTART
```

The DUMP command and its default options instruct the system to perform the following tasks if an autoboot file exists, the autoboot file is enabled, and the START option is specified:

1. Dump all memory and disk-based system data to tape.
2. Boot the system from disk after the dump is completed.
3. Boot with the configuration group CONFIG.SYS.
4. Log on in the user OPERATOR.SYS. (If there is no OPERATOR.SYS user, you will see the MPE prompt).
5. Allow access to all mounted volumes by all users.
6. Restart jobs that are intact.

Entering the DUMP utility and starting the system

A procedure for performing a dump and booting a system includes the following steps:

1. Mount a tape on the tape drive.
2. Soft reset the system using the access port method, boot from the primary path, and enter the DUMP command at the ISL prompt.

Note

If you have a 99X system, you must transfer to the service processor before you can soft reset the system.

```
CM> SP
```

Caution

Do not issue the **RS** command from the console or push the RESET button on the front panel. Hard resetting the system initiates a destructive processor self-test that invalidates dump data.

Caution

There will be a one- to two-second delay between typing **TC** and getting the message **Processor Dependent Code (PDC) revision X.X.** During this time *no keys should be pressed* on the console.

The system prompts for a user identification string and for the correct date and time shortly after receiving the **DUMP** command. The user can enter up to 80 characters, which can later be displayed by DAT when analyzing the dump. There is a 60-second timeout on this prompt. Once a key is pushed on the console keyboard, the timeout is aborted and a carriage return is required to continue with the dump. If a key is not pushed within 60 seconds, the prompt times out, and the dump proceeds with a blank user dump ID in the label. If the date and time are correct, press (Return) at the date prompt. If the date or the time are incorrect, respond as requested with the correct date and time in 24-hour format.

Note

The DUMP procedure shown in example 3-7 was performed on a Series 950 through Series 980 system. The procedure assumes that autoboot is enabled. Make necessary adjustments to the procedure if autoboot is disabled on your system. Sequences from other installations may vary.

```
CM> TC

Processor Dependent Code (PDC) revision 3.2

Console path         = 2/4.1.0.0.0.0.0
Primary boot path    = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.

Autoboot from primary boot path enabled.
To override, press any key within 10 seconds.

** A key is pressed **

Boot from primary boot path (Y or N)?> Y

Interact with IPL (Y or N)?> Y
Booting.


Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Booted.
MMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.28 July 15, 1993

ISL> DUMP
MPE/XL launch facility

MPE/XL Dump Version A.00.00 - initialization
A full dump, including secondary storage, was requested.

Enter user identification string for this dump (80 chars or less):
TEST DUMP 6/9/88
```

Example 3-7. Dumping the System

```
Initialize_genesis - Version : <<870204.1552>>
WED, JUN  8, 1988,  2:30:04 PM (y/n)?

[TMUX_DAM] 15 7 12 14
Initialize memory manager completed.

MPE/XL Dump Facility Version A.00.00

Determine pre-compression size of secondary storage for ldev1
(52 Megabytes of transient objects will be dumped for this device.)
Determine pre-compression size of secondary storage for
ldev2
6 Megabytes of transient objects will
be dumped for this device Tape compression
enabled.
Density set at 6250 BPI on tape drive
tape is ready

Begin dump of Processor Internal Memory.
Processor Internal Memory dump complete.

Begin dump of main memory.
32 Megabytes of main memory will be dumped
.... .... .... ....
Dump of memory save area complete.
.... .... .... ....
Main memory dump complete.

Begin dump of secondary storage for ldev1
52 Megabytes of transient objects will be dumped for this device
.... .... .... .... .... .... .... .... .... .... .... .... ....
Secondary storage dump for ldev1 complete.

Begin dump of secondary storage for ldev2
7 Megabytes of transient objects will be dumped for this device
....
Secondary storage dump for ldev2 complete.

Dump completed - autoboot in progress.

Processor Dependent Code (PDC) revision 3.2
```

Example 3-7. Dumping the System (continued)

```
Console path         = 2/4.1.0.0.0.0.0
Primary boot path    = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.

Soft Booted- -memory state is valid

Autoboot from primary path enabled.
To override, press any key within 10 seconds.

10 seconds expired- -proceeding with autoboot

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4

Booted.
MMSAVE Version 2.2
DUMPAREA protected, proceeding to ISL without memsave
ISL loaded

ISL Revision A.00.28 July 15, 1993

    Cannot find an auto-execute file.  AUTOBOOT ABORTED.

ISL>
```

Example 3-7. Dumping the System (continued)

3. Start the system. Enter the START command at the ISL prompt

   ISL> START

   and any desired options.

   Examples 3-5 and 3-6 and Appendix B list the messages received at the console during a START.

ISL Summary

There are various options available with each utility, as shown below. These options may be entered in any order and must be separated by a blank or a semicolon. Keywords must be entered as shown.

```
START [;GROUP=cgn][;LOGON=acct] [{;RECOVERY  }]
                                [{;NORECOVERY}]

[{;SINGLE-DISC}] [{;SINGLE-USER}]
[{;MULTI-DISC }] [{;MULTI-USER }]

[{;SYSSTART  }]
[{;NOSYSSTART}]
```

When the START option of the UPDATE utility is selected, the remaining options are available.

```
UPDATE [{;CONFIG  }] [{;START  }[options]]
       [{;NOCONFIG}] [{;NOSTART}]

where options are:  [;LOGON=acct][GROUP=cgn]

[{;SINGLE-DISC}] [{;SINGLE-USER}]
[{;MULTI-DISC }] [{;MULTI-USER }]

[{;SYSSTART  }]
[{;NOSYSSTART}]
```

When the START option of the INSTALL utility is selected, the remaining options are available.

```
INSTALL [{;START  }[options]]
        [{;NOSTART}]

where options are:  [;GROUP=cgn][LOGON=acct]

[{;SINGLE-DISC}] [{;SINGLE-USER}]
[{;MULTI-DISC }] [{;MULTI-USER }]

[{;SYSSTART  }]
[{;NOSYSSTART}]
```

When the START option of the DUMP utility is selected, the remaining options are available.

```
DUMP [SUBSET={ALL   }] [{;START  }[options]]
             {MEMORY}] [{;NOSTART}]

Where options are:

[{;RECOVERY  }] [{;SINGLE-DISC}]
[{;NORECOVERY}] [{;MULTI-DISC }]

[{;SINGLE-USER}] [{;SYSSTART  }]
[{;MULTI-USER }] [{;NOSYSSTART}]
```

All available options are defined in Table 3-3.

Table 3-3. Utility Options

Options	Functions
CONFIG or **NOCONFIG** Default: **NOCONFIG**	During an **UPDATE**, this option specifies whether or not the configuration data files on disk (**CONFIG** group), are replaced by those on tape (**CONFIG**). If this option is not specified, the default is **NOCONFIG**.
GROUP= *configname* Default: **GROUP = CONFIG**	When the system is booted with **NORECOVERY**, the group specified after **GROUP=** is the source of configuration information. When performing an **UPDATE**, **INSTALL**, or **DUMP**, this group is only in effect if **START** is specified or defaulted. When a **START** command is entered, the group specified (or defaulted) for it overrides any previous specification. Since configuration groups reside in the **SYS** account, you do not specify the account name.
LOGON= *accountname* Default: **LOGON=** **OPERATOR.SYS**	The logon account contains a standard logon. When the system is booted, the account specified after **LOGON=** is used to initiate a session. When **SINGLE-USER** has been specified, the account specified in **LOGON=** is used as the single user. If **LOGON=** is not specified on the command line, the logon defaults to **OPERATOR.SYS** (if the OPERATOR.SYS user has been created).
RECOVERY or **NORECOVERY** Default: **RECOVERY** (except with **START** after **INSTALL** or **UPDATE**)	During a **START** or an autoboot after a **DUMP**, this option indicates whether or not restartable jobs are restarted. On **DUMP**, this option is in effect only if **START** is specified or defaulted. If this option is not specified, the default is **RECOVERY**. Note on an **INSTALL** or **UPDATE**, jobs cannot be restarted, and the next **START** defaults to **NORECOVERY**. Use **NORECOVERY** if the system configuration has changed. If **RECOVERY** is specified and the system configuration has changed, the system recovers restartable jobs by using the previous system configuration and ignores the new system configuration and any **GROUP=** specification.
SINGLE-DISC or **MULTI-DISC** (Primarily Used for Diagnostics) Default: **MULTI-DISC**	This option determines whether or not the system initiates with all of the volumes mounted (**MULTI-DISC**) or only the system master volume mounted (**SINGLE-DISC**). If neither is specified, **MULTI-DISC** is the default. **SINGLE-DISC** can be specified only if **SINGLE-USER** has also been selected. If the **SINGLE-DISC** option is selected with **MULTI-USER**, the system issues a warning message and changes the **SINGLE-DISC** option to **MULTI-DISC**. If the **START** parameter is not specified or defaulted on an **INSTALL**, **UPDATE**, or **DUMP**, the **SINGLE-DISC** parameter is ignored.
SINGLE-USER or **MULTI-USER** (Primarily Used for Diagnostics) Default: **MULTI-USER**	This option boots the system with either single user capability or with multiuser capability and all configured terminals available. **MULTI-USER** is the default. **SINGLE-USER** is used primarily for diagnostic support. For the **INSTALL**, **UPDATE**, and **DUMP** utilities, the **SINGLE-USER/MULTI-USER** option is available only if **START** is specified or defaulted as an option.
START or **NOSTART** Default: **START**	This option instructs **UPDATE**, **INSTALL**, or **DUMP** whether or not to autoboot (**START**) after the utility has completed its job. If neither **START** nor **NOSTART** is specified, **START** is the default.

Table 3-4. Utility Options

Options	Functions
SUBSET = ALL or SUBSET = MEMORY Default: SUBSET = ALL	During a dump, this option indicates whether the contents of main memory alone or main memory and secondary storage is dumped to tape for later analysis. If the subset is not specified, it defaults to ALL (main memory and secondary storage).
SYSSTART or NOSYSSTART Default: SYSSTART	On an INSTALL, UPDATE, START, or DUMP, this option determines whether or not the system startup file is used during the current boot. If neither SYSSTART nor NOSYSSTART is selected, SYSSTART (using the system startup file) is the default. If the START parameter is not specified or defaulted on an INSTALL, UPDATE, or DUMP, this parameter is ignored.

Table 3-5 summarizes system startup utilities with their more commonly used options.

Table 3-5. Summary of System Startup Functions

MPE/iX Utility	MPE/iX Function (When To Use)	Spool file Recovery	Permanent User Files
`START` or `START RECOVERY`	Starts system from disk. If `RECOVERY` is used immediately after changing system configuration, the system recovers restartable jobs by using the previous system configuration and ignores the new system configuration.	Yes	Retained
`START NORECOVERY`	Starts system from disk. Use after changing system configuration. Use to recover from system hang or failure.	Yes output only	Retained
`UPDATE` or `UPDATE NOCONFIG`	Boots system from the SLT. Replaces system files on disk with those from SLT. System uses configuration files from disk. Use to update current version of operating system while maintaining current configuration. Use to recover from system hang or failure.	Yes output only	Retained
`UPDATE CONFIG`	Boots system from the SLT. Replaces system files with those on the SLT. Replaces the configuration files on disk (in the group `CONFIG.SYS`) with those from the SLT.	Yes output only	Retained
`INSTALL` or `INSTALL START`	Boots system from SLT. Replaces all system boot files and base system files on the system volume (LDEV 1) with the information on the SLT. Replaces configuration files with SLT defaults. Autoboots system after completing install. Use to install a version of the operating system or to recover from a disk crash or severe system failure.	No	Lost from system disks. User files remain on nonsystem volumes.
`INSTALL NOSTART`	Performs similarly to `INSTALL` or `INSTALL START`, but `INSTALL NOSTART` does not attempt to start the system after completing the install.	No	Lost from system disks. User files remain on nonsystem volumes.
`DUMP`	Boots system from disk. Stores current state of system main memory and optionally secondary memory to tape for later analysis. Use to analyze causes of system failure.	Yes output only	Retained

4

Using the System Generator (SYSGEN)

SYSGEN is a utility used to modify the system configuration. System configuration changes are kept to disk in a configuration group or to a tape called a system load tape (SLT). The SYSGEN utility requires system supervisor (OP) capability to view system configuration and system manager (SM) capability to save changes or create an SLT.

SYSGEN contains a global module and four configurators:

- **Input/Output (IO) Configurator.** Configures the local devices for the target system.
- **Logging (LOG) Configurator.** Changes the attributes of the user logging and system logging processes.
- **Miscellaneous (MISC) Configurator.** Focuses on system limits and startup values, especially those related to jobs, sessions, and processes.
- **System File (SYSFILE) Configurator.** Changes the list of files dumped to an SLT.

Each configurator provides an interface to make changes to an independent portion of the configuration data and offers a menu of commands and online syntax help. Command names and abbreviations are easily identified. For example, the command to add a device is `ADEV` (abbreviated `AD`), while the command to delete a device is `DDEV` (abbreviated `DD`).

The configurators operate on information contained in the base configuration group. This basegroup is the group used to begin making changes to the system configuration. The basegroup includes a permanent set of configuration files that contain information on device classes, assigned I/O paths, assigned logical device (LDEV) numbers, current volume names, and various other system parameters.

Activating SYSGEN creates a set of temporary configuration files that correspond to the permanent file set specified with the `BASEGROUP` command. Configuration changes are made to the temporary configuration files. Once the changes are complete, the system manager uses the `KEEP` command to overwrite the permanent file set with the temporary file set or to save the temporary files to another permanent file set.

When `KEEP` is used to save changes to a new group name, SYSGEN stores the modified base group files in a group in the `SYS` account.

The changes take effect once the system is rebooted with **START NORECOVERY**.

SYSGEN also provides a **CLEAR** command to erase changes made through one or more of the configurators.

Note

When SYSGEN generates a boot tape, it writes the current configuration data as the group **CONFIG.SYS**, regardless of the group name on disk. **CONFIG** is the group selected by default by the START utility and used to start a system. For more information on the START utility, refer to Chapter 3.

Entering the SYSGEN Global Module

The command for the SYSGEN utility is **SYSGEN**. SYSGEN has four positional parameters:

```
SYSGEN    [ basegroup ]
          [ ,newgroup ]
          [ ,inputfile ]
          [ ,outputfile ]
```

The *basegroup* parameter specifies the group in the **SYS** account that contains the configuration data file set to be used or changed. The default base group is the group used to boot the system (usually **CONFIG**). The default base group is the group specified in the initial system load (ISL) **START** command line. (For information on specifying configuration groups during **START**, refer to Chapter 3.)

If you attempt to specify a nonexistent group using the **BASEGROUP** command, SYSGEN issues the following message:

```
**error** group groupname does not exist
```

The *newgroup* parameter specifies the group used to store data. If you do not specify *newgroup*, SYSGEN stores any configuration changes in the base group by default.

If the group specified by *newgroup* already exists, SYSGEN asks, at keep time, whether or not it should overwrite that group with new information. At keep time, if the user does a **KEEP** with no parameters, SYSGEN keeps the current base group unless *newgroup* was specified, in which case the group given is used. More information on using the **KEEP** command is provided later in this chapter.

The *inputfile* parameter specifies the file designator of the file for command input. The formal file designator is **SYSGIN**. The default is **$STDINX**.

The *outputfile* parameter specifies the file designator of the file for SYSGEN output. The formal file designator is **SYSGOUT**. The default is **$STDLIST**.

When using parameters with the SYSGEN command, place them immediately following the command:

:SYSGEN [*basegroup*] [, *newgroup*] [, *inputfile*]
[, *outputfile*]

When using parameters with RUN SYSGEN.PUB.SYS, you must specify them in the phrase INFO=" ":

RUN SYSGEN.PUB.SYS;INFO=
"[*basegroup*] [, *newgroup*]
[, *inputfile*] [, *outputfile*]"

Example 4-1 illustrates activating SYSGEN's global module. Activate the SYSGEN global module by entering the command SYSGEN or by entering RUN SYSGEN.PUB.SYS.

```
:SYSGEN

SYSGEN version C.02.05 : catalog version C.02.05 FRI, MAY
20, 1990
Copyright 1987 Hewlett-Packard Co.  All Rights Reserved

        **  First level command **

        io                log (lo)       misc (mi)
spu (sp)
        sysfile (sy)

        basegroup (ba)    keep (ke)      permyes (pe)
show (sh)
        tape (ta)

        clear (cl)(c)     exit (ex)(e)   help (he)(h)
oclose (oc)
        redo
sysgen>
```

Example 4-1. Activating SYSGEN's Global Module

Using the Help Facility in SYSGEN's Global Module

The help facility provides a list of the commands available at each functional level of SYSGEN. In addition, help provides the syntax of an individual command or the syntax of each command in the configurator or at the first-level menu.

To obtain a list of the first-level commands, enter **HELP** (abbreviated **HE** or **H**) at the SYSGEN prompt as shown in the following example.

```
sysgen>HELP

        **  First level command **

        io                  log (lo)        misc (mi)
spu (sp)
        sysfile (sy)

        basegroup (ba)      keep (ke)       permyes (pe)
show (sh)
        tape (ta)

        clear (cl)(c)       exit (ex)(e)    help (he)(h)
oclose (oc)
        redo
sysgen>
```

Example 4-2. SYSGEN's Global Module Help Facility

To display the syntax for each available command at the current level, enter HELP ALL as shown in the following example:

```
sysgen>HELP ALL

        command (abb)  parameter=value
        -------------  ---------------
        io
        misc (mi)
        log (lo)
        spu (sp)
        sysfile (sy)
        basegroup (ba) [name  = groupname]
        keep (ke) (k)  [name  = groupname]
        show (sh)      [type  = BASEGROUP|NEWGROUP|VERSION|
                                PERMYES|CONFIGURATOR|ALL]
                       [dest  = OFFLINE]
        permyes (pe)   [mode  = ON|OFF]
        tape (ta)      [mode  =
VERBOSE|NOCHANGE|NOCONFIG|NODIAG|
                                NOLOGNUM|LOGNUM]
                       [dest  = OFFLINE]

        **  Common configurator commands **

        clear (cl)(c)
        exit (ex)(e)
        help (he)(h)   [command = ALL | command-name]
        hold (ho)
        oclose (oc)
        redo

 sysgen>
```


Example 4-3. SYSGEN Global Module HELP ALL

To display a listing of the syntax for a first-level command, enter HELP *commandname* as shown in the following example:

```
sysgen>HELP BASEGROUP

basegroup  (ba) [name=groupname]
```

Using First-Level (Global Module) Commands

The first-level commands, displayed after entering SYSGEN, allow you to activate one of the four configurators (I/O, LOG, MISC, SYSFILE) or or to keep, show, or clear changes made from the configurators. In addition, you can use first-level commands to call the SYSGEN help facility, alter basegroups, store configuration changes to tape, or exit the SYSGEN utility. The following table describes the commands and their actions:

Table 4-1. Using First-Level Commands

Command	Meaning
IO	Activates the I/O Configurator. For additional information on the IO command, refer to "Entering the I/O Configurator."
LOG or LO	Provides access to the LOG configurator commands.
MISC or MI	Provides access to the MISC configurator commands.
SPU or SP	Provides access to the SPU configurator commands
SYSFILE or SY	Provides access to the SYSFILE configurator commands.
BASEGROUP or BA	Changes the default group after the utility is activated. Previous changes, if any, are lost. The configuration begins anew.
KEEP or KE or K	Saves configuration changes that were made in the configurators and temporarily stored with the HOLD command.
PERMYES or PE	Controls SYSGEN's interactive confirmation for potentially serious action, such as an EXIT before a KEEP.
SHOW or SH	Shows the state of individual configurators, combined configurators, or all configurators.
TAPE or TA	Generates a boot tape. All configuration changes made are reflected on the tape.
CLEAR or CL or C	Clears all changes made from all configurators.
EXIT or EX or E	Exits the global module and returns to the operating system prompt.
HELP or HE or H	Displays the list of commands, the individual command syntax, or the syntax of all the first level commands.
OCLOSE or OC	Closes the offline listing file, SYSGLIST.
REDO	Used for making corrections. Follows the command interpreter REDO conventions.
:*command*	Allows you to enter various MPE/iX command interpreter commands.

SYSGEN Command Syntax

Commands can be classified as either command only or command with parameters(s). Commands with parameters can be specified in one of the following ways:

positional parameters
keyword parameters
options

Note

The command structure established by SYSGEN enables the user to select the manner in which parameters accompany the command.

Positional parameters are assigned a position in the parameter sequence. Separate parameters by semicolons or blanks, or exclude them by using consecutive semicolons. Enclose subparameters and repeated parameters in parentheses, and separate them by commas or blanks.

A subparameter can be either strings or numeric values separated by blanks or commas. Enclose them in parentheses if more than one is present. Always specify subparameters by fixed position within the subparameter list. You can omit subparameters by entering consecutive commas.

A repeated parameter is a single parameter value that can be repeated an arbitrary number of times. Separate parameters by commas or blanks, and enclose them in parentheses () if more than one is present.

Halting SYSGEN Command Actions

Entering CTRL Y stops listings or cancels partially entered SYSGEN commands.

Issue CTRL Y at any point in SYSGEN. SYSGEN terminates the current action and returns its prompt. If you enter CTRL Y while SYSGEN is generating a boot tape, you have the option of terminating or continuing the tape generation process.

CTRL Y is effective if the SYSGEN output and input has not been redirected and if SYSGEN is being run from a session.

Specifying the Base Group

When altering or viewing a configuration through SYSGEN, you must first select the configuration group for the operation. Select this basegroup by using the *basegroup* parameter or the **BASEGROUP** command.

You can specify the group only from the global module in SYSGEN, but you can accomplish this in two ways. You can use the *basegroup* optional parameter in the **SYSGEN** command line:

```
:SYSGEN[basegroup][,newgroup][,inputfile]
[,outputfile]
```

Also, you can enter the SYSGEN global module and use the first-level command **BASEGROUP**:

```
sysgen>BASEGROUP groupname
```

The syntax for the **BASEGROUP** command (abbreviated **BA**) is:

```
BASEGROUP [ [NAME=] groupname]
```

The *groupname* parameter is a string of up to eight characters. For example, to use **BASEGROUP**, enter the command and its parameter as shown:

```
sysgen>BASEGROUP CONFG935
```

or

```
sysgen>BA MYCONFIG
```

BA switches you to a different configuration group. (List configuration information through the **LIST** and **SHOW** commands of the various configurators.)

If you specify a nonexistent group, SYSGEN issues an error message:

```
sysgen>BASEGROUP FEUDAL

**error** group "FEUDAL" does not exist

sysgen>
```

Confirming Potentially Serious Actions

SYSGEN is initially set to confirm a potentially serious action. If, for example, you make configuration changes and attempt to exit without saving the changes, SYSGEN warns you that you are about to lose your changes.

You can enable **PERMYES** to automatically accept all decisions entered at the terminal or disable it to ask if the user wishes to change a command that seems improper. The abbreviated command for **PERMYES** is **PE**. This command is particularly useful when SYSGEN receives input commands from a file or batch job.

If **PERMYES** is **OFF** (the default), SYSGEN prompts you for a YES/NO response whenever a potentially serious action, such as exiting SYSGEN without saving configuration changes, is initiated. If you respond negatively, the action does not take place and the command is ignored. If **PERMYES** is ON, you are not prompted for confirmation. SYSGEN executes the command exactly as entered.

To enable **PERMYES**, enter **PERMYES ON** at the SYSGEN prompt:

```
sysgen>PERMYES ON
```

To disable **PERMYES**, enter **PERMYES OFF** at the SYSGEN prompt:

```
sysgen>PERMYES OFF
```

Once **PERMYES** is disabled, SYSGEN issues messages to prompt for confirmation. Example 4-4 demonstrates **PERMYES OFF** action.

Note

PERMYES should always be set ON in command files to allow SYSGEN to continue where confirmation would be requested.

```
:SYSGEN

SYSGEN version D.01.01 : catalog version D.01.01    TUE, SEP
14, 1993
Copyright 1987 Hewlett-Packard Co.  All Rights Reserved

        **  First level command **

        io                log (lo)       misc (mi)
spu (sp)
        sysfile (sy)

        basegroup (ba)    keep (ke)      permyes (pe)
show (sh)
        tape (ta)

        clear (cl)(c)     exit (ex)(e)   help (he)(h)
oclose (oc)
        redo
sysgen>
sysgen>PERMYES OFF
sysgen>SYSFILE

        **  SYSFILE configurator commands **

        aauto (aa)      aboot (ab)      acmsl (ac)
asprog (as)
        cmsl (cm)       dauto (da)      dboot (db)
dcmsl (dc)
        dsprog (ds)     lcmsl (cl)      rauto (ra)
rboot (rb)
        rcat (rc)       rcmsl (rcm)     rdcc (rd)
ripl (ri)
        rnmlib (rn)     rsprog (rs)     show (sh)

        clear (cl)(c)   exit (ex)(e)    help (he)(h)
hold (ho)
sysfile>
sysfile>ASPROG FCOPY.PUB.SYS FCOPY.PUB.SYS  ** Add
FCOPY to SYSGEN tape **
sysfile>E            *** Exit without saving ***

        configuration changes are not kept yet!
        still want to exit (yes/no) ?NO
sysfile>
```

Example 4-4. PERMYES OFF Action

Example 4-5 shows how SYSGEN overrides user input with **PERMYES** enabled.

```
:SYSGEN

SYSGEN version D.01.01 : catalog version D.01.01    TUE, SEP
14, 1993
Copyright 1987 Hewlett-Packard Co.  All Rights Reserved

        **  First level command **

        io                log (lo)       misc (mi)
spu (sp)
        sysfile (sy)

        basegroup (ba)    keep (ke)      permyes (pe)
show (sh)
        tape (ta)

        clear (cl)(c)     exit (ex)(e)   help (he)(h)
oclose (oc)
        redo
sysgen>
sysgen>PERMYES ON
sysgen>SYSFILE

        **  SYSFILE configurator commands **

        aauto (aa)      aboot (ab)      acmsl (ac)
asprog (as)
        cmsl (cm)       dauto (da)      dboot (db)
dcmsl (dc)
        dsprog (ds)     lcmsl (cl)      rauto (ra)
rboot (rb)
        rcat (rc)       rcmsl (rcm)     rdcc (rd)
ripl (ri)
        rnmlib (rn)     rsprog (rs)     show (sh)

        clear (cl)(c)   exit (ex)(e)    help (he)(h)
hold (ho)
sysfile>
sysfile>ASPROG FCOPY.PUB.SYS FCOPY.PUB.SYS  ** Add
FCOPY to SYSGEN tape **
sysfile>E            *** Exit without saving ***

        configuration changes are not kept yet!
        still want to exit (yes/no) ?Automatic yes
sysgen>
```

Example 4-5 PERMYES ON Action

Enabling PERMYES saves time and effort by answering YES to all prompting, particularly when a command input file is used or a batch job is executed. Enabling PERMYES can also allow mistakes. In the previous example, the changes are not kept because the HOLD command was not entered, and the system automatically answered YES to the (YES/NO) exit confirmation.

Showing the State of Configurators

The SHOW command (abbreviated SH) displays the current state of the SYSGEN global facilities.

SHOW has the following syntax:

```
SHOW    [TYPE =   BASEGROUP    ]
                [ NEWGROUP     ]
                [ VERSION      ]
                [ PERMYES      ]
                [ CONFIGURATOR ]
                [ ALL          ]
          [DEST =   OFFLINE    ]
```

BASEGROUP lists the name of the current working configuration's base group.

NEWGROUP lists the name of the current new configuration group.

VERSION displays the version number of SYSGEN. The version number is also displayed in the SYSGEN banner.

PERMYES shows whether SYSGEN prompts you for confirmation before performing potentially serious commands.

CONFIGURATOR lists all modified configurators.

ALL provides a combined listing of the configuration information provided by the TYPE parameters defined above.

OFFLINE sends output to SYSGEN's listing file, SYSGLIST. Using OFFLINE in the SHOW command line does not immediately generate a printout. The information is sent to SYSGLIST until you either enter the OCLOSE command or exit SYSGEN. Exiting SYSGEN or using OCLOSE closes SYSGLIST and prints the file.

Entering SHOW without TYPE parameters is the same as specifying SHOW ALL. Example 4-6 demonstrates using the SHOW ALL command.

```
sysgen>SHOW ALL
       base configuration group = CONFIG
       new configuration group =
       SYSGEN version D.01.01 : catalog version D.01.01
       permyes is false--system will have to answer
questions
       ** no configurators are modified**
```

Example 4-6. Using the Global Module SHOW ALL

Activating the Configurators

The commands for entering each of the configurators (`IO`, `LOG`, `MISC`, `SYSFILE`) are SYSGEN first-level commands. To activate the configurators, you must first enter the SYSGEN Global module.

Once you have the SYSGEN prompt, enter either `IO`, `LOG`, `MISC`, or `SYSFILE` to activate the Input/Output, Logging, Miscellaneous, or System File configurators, respectively. Example 4-7 demonstrates activating a configurator:

```
:SYSGEN

SYSGEN version D.01.01 : catalog version D.01.00    TUE, SEP
14, 1993
Copyright 1987 Hewlett-Packard Co. All Rights Reserved.

        **  First level command **

        io                log (lo)       misc (mi)
spu (sp)
        sysfile (sy)

        basegroup (ba)    keep (ke)      permyes (pe)
show (sh)
        tape (ta)

        clear (cl)(c)     exit (ex)(e)   help (he)(h)
oclose (oc)
        redo
sysgen>
sysgen>IO

        **  IO configurator commands **

        aclass (ac)       adev (ad)      apath (ap)      avol
(av)
        dclass (dc)       ddev (dd)      dpath (dp)      dvol
(dv)
        lclass (lc)       ldev (ld)      lpath (lp)      lvol
(lv)
        maddress (ma)     mclass (mc)    mdev (md)
mpath (mp)
        mvol (mv)

        clear (cl)(c)     exit (ex)(e)   help (he)(h)    hold
(ho)
        oclose (oc)        redo
     io>
```

Example 4-7. Activating a SYSGEN Configurator

For information on a particular configurator, refer to the chapter that discusses the configurator.

Clearing Configuration Changes

The SYSGEN global module **CLEAR** command (abbreviated **CL**) removes all temporary changes made from the four configurators. If, for example, you make IO and SYSFILE configurator changes and decide not to keep them, issue the global module **CLEAR** command to remove the changes made in both configurators.

To clear all temporary changes made from the IO, LOG, MISC, and SYSFILE configurators, enter **CLEAR** at the SYSGEN prompt:

```
sysgen>CLEAR
```

Saving Configuration Changes

Saving configuration changes is a two-step process. After making the changes in any of the configurators, you must hold those changes before exiting the configurator to continue your work.

Use the **HOLD** command to temporarily hold the changes made in a configurator. Holding changes allows you to move among configurators or between a configurator and the global module without losing changes.

Refer to the sections on the IO, LOG, MISC, or SYSFILE configurators for information on using **HOLD** within each configurator.

The **KEEP** command (abbreviated **KE** or **K**) saves (stores to disk files) changes held from any of the SYSGEN configurators.

KEEP has the syntax:

```
KEEP    [ [NAME=] groupname ]
```

Groupname may be eight characters or fewer and must begin with an alphabetic character.

SYSGEN keeps track of the current configuration group, whether it is the default group with which you booted the system, a group specified by the *basegroup* parameter on the initial SYSGEN command line, or a group switched to by the **BASEGROUP** global configurator command. If you do not specify a basegroup with the **KEEP** command and did not specify a group with the *newgroup* parameter on the initial SYSGEN command line, SYSGEN uses the current working base group (either the default or the one set by a method listed above) to save the configuration changes.

The **KEEP** command can be used to save configuration changes to a group other than the current working group. In addition, if the desired group does not already exist, the **KEEP** command creates it and then saves the configuration changes to it. All groups are saved in the **SYS** account.

To keep changes to a group other than the current working configuration group, enter the KEEP command and a new group name:

```
sysgen>KEEP NEWCONFG    (Sample name only)
```

If changes are being saved to a group that has existing configuration files, SYSGEN asks if that group should be overwritten:

```
sysgen>KEEP FEUDAL

purge old configuration (yes/no) ?NO

** configuration files not saved **
```

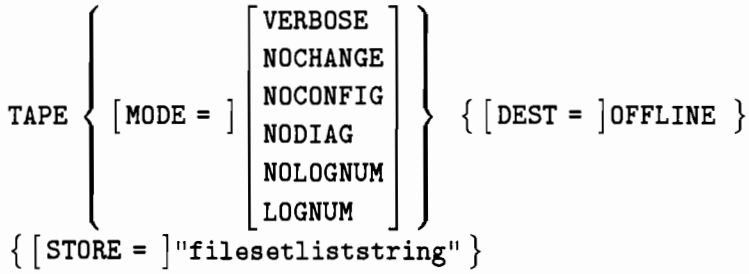
Answering NO cancels the command.

If insufficient space exists on the main system disk to accommodate the creation of a new configuration group, SYSGEN issues a message indicating this. SYSGEN then terminates, losing the temporary files and the changes.

Generating a System Load Tape

The TAPE command (abbreviated TA) generates an SLT from system configuration information. The configuration is written to the CONFIG group of the SYS account on the tape.

TAPE has the following syntax:



VERBOSE prompts the TAPE command to list the number of nonuser files to be dumped and lists the name of each file as it is dumped to the boot tape.

By default, SYSGEN changes SYSFILE configurations as they are dumped to tape, so source name equals the destination name.

NOCHANGE prevents SYSGEN from changing the names in the SYSFILE configurator as it makes the boot tape.

NOCONFIG prevents SYSGEN from dumping the current configuration files as it makes the tape.

NODIAG prevents SYSGEN from dumping the diagnostic files as it makes the tape.

Note

Using this parameter creates a tape that does not contain a complete system. Installing from this tape may not produce a bootable system.

NOLOGNUM resets the system and datacom log numbers to zero (0).

LOGNUM is the default. It specifies that SYSGEN should carry forward the system and datacom log numbers and not reset to zero (0).

OFFLINE directs the listing created by VERBOSE to SYSGEN's listing file, SYSGLIST.

Using OFFLINE in the TAPE command line does not immediately generate a printout. The information is sent to SYSGLIST until you enter the global module OCLOSE command or exit SYSGEN. Exiting SYSGEN or using OCLOSE closes SYSGLIST and prints the file.

STORE allows the user files that are specified in the file set list to be stored after the SLT. (The *filesetliststring* parameter is the same as the parameter specified with the STORE utility.

All configuration changes made are reflected on the tape. (The temporary changes remain valid after SYSGEN has generated a tape.) Tapes created by the TAPE command do not contain the system file directory.

Note

SYSGEN detects all system-independent errors; however, due to SYSGEN's lack of knowledge of the physical attributes of a target system, system-dependent errors cannot be detected when a system load tape is generated.

To generate a system load tape (SLT), perform the following tasks:

1. Log on to the console as MANAGER.SYS. Enter:

   :HELLO MANAGER[/*userpass*].SYS[/*acctpass*]

Note

If the user has system supervisor (OP) capability, but not system manager (SM) capability, an SLT can still be made; however no configuration changes can be made. Follow steps 2, 3, 10, and 11.

2. Activate SYSGEN and access the configuration group that you want to store on the boot tape. Enter:

```
:SYSGEN groupname

SYSGEN version D.01.01 : catalog version D.01.00    TUE, SEP
14, 1993
Copyright 1987 Hewlett-Packard Co. All Rights Reserved.

        **  First level command **

        io                log (lo)       misc (mi)
spu (sp)
        sysfile (sy)

        basegroup (ba)    keep (ke)      permyes (pe)
show (sh)
        tape (ta)

        clear (lc)(c)     exit (ex)(e)   help (he)(h)
oclose (oc)
        redo
sysgen>
```

Example 4-8. Accessing a Configuration Group

3. Make any desired changes from the IO, LOG, or MISC configurators.

   Refer to Chapter 5, and Chapter 7 for information on using the IO, LOG, and MISC configurators to alter the system configuration.

4. After completing any changes, but before exiting a configurator, enter:

   ```
   HOLD
   ```

   The HOLD command saves changes (to a temporary file) made in the configurator at the time that the HOLD is issued.

5. Decide which files to dump to tape.

   SYSGEN allows you to choose which files to store to a boot tape. You may store autoboot images, boot images, and system programs.

   The SYSFILE configurator provides the utilities and commands that alter boot tape contents. For information on the commands available for adjusting boot tape contents, refer to Chapter 8.

6. Hold any changes made in step 6.

   After completing any changes, but before exiting the configurator, enter:

   ```
   sysfile>HOLD
   ```

7. Exit the SYSFILE configurator. Enter:

   ```
   sysfile>EXIT
   ```

8. Issue the **KEEP** command to store all changes to a set of permanent disk files by entering:

   ```
   sysgen>KEEP groupname
   ```

9. Mount a write-enabled tape on the tape drive.

   When you mount the tape on the tape drive, the system issues a message similar to the following:

   ```
   10:15/10/Vol (unlabeled) mounted on LDEV# 7
   ```

10. Generate the tape.

    - To create only a system load tape (SLT), enter the following command:

      ```
      sysgen>TAPE
      ```

      This is a tape containing the operating system and specified configuration information.

    - To create a system load tape with user files stored after it, enter the following command:

      ```
      sysgen>TAPE STORE="filesetlist"
      ```

      You can list the user files that you wish to store as input to the **STORE=** parameter. Note that the string of file names to be stored after the SLT must be enclosed in quotes. You can also use the wildcard @ to include all users files on the system (@.@.@), in specific accounts (@.@.SYS, @.@.AR), and in specific groups of accounts (@.PUB.SYS, @.CURRENT.AR).

    The system responds by issuing a message similar to the following:

    ```
    ?10:15/#92/46/LDEV# FOR "SYSGTAPE" ON TAPE (NUM)
    ```

    Respond to the tape request to start the **STORE** when the system issues the above message. When the store is complete, the system issues a message indicating that it has completed the tape:

    ```
    **Boot tape is successfully built**
    ```

11. After all the files are stored, unload the tape and write- protect it. Label the tape and store it in a secure location with other backup materials.

Redirecting SYSGEN Input and Output

By using SYSGEN's file designators, you can redirect SYSGEN's input and output. Redirecting SYSGEN's input and output enables you, for example, to issue commands to SYSGEN using command files that can operate without user intervention or interactive keyboard input.

SYSGEN uses three formal file designators for input, output, and listing:

- **SYSGIN**. The formal file designator for the standard SYSGEN input file. By default, this file is set to **$STDINX**.
- **SYSGOUT**. The formal file designator for the standard SYSGEN output file. By default, this file is set to **$STDLIST**.
- **SYSGLIST**. The formal file designator for the standard SYSGEN listing file. By default, this file is set to any device in the class **LP**.

$STDINX and **$STDLIST** are the file names for the terminal from which SYSGEN is run. The device in class **LP** is your system printer.

Redirect SYSGEN input and output by using the **FILE** command and equating some other files to **SYSGIN**, **SYSGOUT**, and **SYSGLIST**, or by using the **INFO** parameter and options in the **SYSGEN** command line.

For example, the commands **FILE SYSGIN=NEWIN** and **SYSGEN,,NEWIN** accomplish the same task. When SYSGEN is activated, they utilize **NEWIN** as the input file. Likewise, the commands **FILE SYSGOUT=NEWOUT** and **SYSGEN,,,NEWOUT** equate **NEWOUT** to the formal file designator, **SYSGOUT**, so SYSGEN utilizes **NEWOUT** as the output file.

With redirection you can use a command input file to complete common routines that you perform frequently. Example 4-9 lists a three-line job stream (named **SYSGENON**) which, when run using the **STREAM** command, logs on to the system, enters SYSGEN, and executes the SYSGEN command file (**LISTIT**) in example 4-10.

Refer to *MPE/iX Commands Reference Manual Volumes 1 and 2* (32650-90003 and 32650-90364) for information on the **STREAM** command.

```
1     !JOB SYSGENON,MANAGER/userpass.SYS/acctpass,groupname
2     !SYSGEN,,LISTIT
3     !EOJ
```

Example 4-9. Command File (SYSGENON) Created With EDITOR

Table 4-2 explains the actions performed by each line of the preceding command file.

Table 4-2. Actions Performed by Command File Example

Line	Action
1	Log on to the file **SYSGENON** as **MANAGER.SYS** with all accompanying system manager capabilities.
2	Activate SYSGEN and redirect input so that SYSGEN uses the file named **LISTIT** as the input file.
3	End the job file after SYSGEN has completed the tasks outlined by the SYSGEN command file **LISTIT**.

Example 4-10 lists the contents of the command file (LISTIT), which, when run, prints SYSGEN information on the system printer.

```
1     PERMYES ON
2     IO
3     LDEV DEST=OFFLINE
4     LPATH DEST=OFFLINE
5     LCLASS DEST=OFFLINE
6     OCLOSE
7     EXIT
8     EXIT
```

Example 4-10. SYSGEN Command File (LISTIT)

Table 4-3 explains the actions performed by the lines of the command file example.

Table 4-3. Actions Performed by Command File LISTIT

Line	Action
1	Set **PERMYES ON**. Recommended for all command files.
2	Activate the IO configurator.
3	Send the characteristics of configured I/O devices to the listing file **SYSGLIST**.
4	Send the characteristics of configured I/O paths to the listing file.
5	Send the class name, class mode, and devices associated with each class to the listing file.
6	Close (print) the listing file.
7	Exit the IO configurator.
8	Exit SYSGEN.

When using SYSGEN in a noninteractive mode (such as a batch job or a command file), certain conditions may occur that cause SYSGEN to ask for confirmation. For example, if a **KEEP** is attempted on top of an already existing configuration group, SYSGEN asks for confirmation. If no configuration exists, no questions are asked.

When you set up the input to SYSGEN you may not know if the question will be asked. To ensure the operation's success, set **PERMYES ON** at the beginning of any set of noninteractive commands as shown in step 1 above.

Exiting SYSGEN

Use the **EXIT** command (abbreviated **EX** or **E**) to exit from a configurator and return to the SYSGEN global module, or to terminate SYSGEN and return to the MPE prompt.

To exit either a configurator or SYSGEN, enter **EXIT** at the prompt:

```
log>EXIT

sysgen>
```

or

```
sysgen>EXIT

:
```

Note that the MPE prompt returns after SYSGEN ends.

5

Modifying Input/Output (IO) Configurations

The IO configurator configures the local devices for a host or target system. A new system configuration can be used to generate a new boot tape, and the boot tape can be used to update or install another system. The new system configuration can be activated on the current system by keeping the configuration and rebooting with `START NORECOVERY`.

The IO configurator configures only the local devices of the system. Remote devices, such as terminals on a distributed terminal subsystem and remote serial printers, are configured through the network management configurator.

I/O Paths

An I/O path is the system address assigned to the device interface hardware and the physical path used to reach an I/O device. Additions, changes, or deletions to an I/O path require that the path identify the applicable device adapter interfaces and their associated I/O devices.

At system power on or reset, the processor-dependent code (PDC) and I/O-dependent code (IODC) hardware routines read and initialize the I/O paths used to boot or reboot the system. The I/O paths that are used to load the system from disk or tape are referred to as *boot paths*.

Selecting I/O Paths

An I/O path is determined by the channel adapter (CA) module number, the device adapter (DA) slot number, and the device address.

Series 922 through Series 949 systems

Each I/O path is constructed "top down." On the HP 3000 Series 922 through Series 949 systems, I/O path construction begins with the channel adapter, which connects the system central bus and the channel I/O (CIO) bus. The logical construction concludes with the device adapter, which connects the CIO bus and I/O device. An I/O device connects to a device adapter card through an interface cable.

Note

The examples used to demonstrate the procedures in this chapter were created using a Series 925 system, unless otherwise specified. Your system may produce slightly different information.

An HP 3000 Series 925 through Series 949 I/O path is specified as follows:

```
CA Module Number.DA Slot Number.Device Address
```

The CA module specifies the number of the interface slots that contain the two adapter boards for the channel I/O bus (CIO) and central bus (CTB). The interface slot is assigned a numerical value of 4 or 8 for a 949 (device adapters in SPU) or 8 (device adapters in Series 925 CIO expander) or 36 or 40 for a 949 (device adapters in Series 935 CIO expander).

DA CIO section slot numbers range from 0 to 13. It is recommended you use slots 0 through 7.

The address of the device itself depends on the adapter. In addition, a data communications device can have an additional logical or virtual device number in the I/O path specification.

For example, if the CA module number is 4, the HP-IB channel CIO interface slot is 5, and the magnetic tape device address is 0, the I/O path for the tape device is 4.5.0.

Series 950 through Series 980 systems

On the HP 3000 Series 950 through 980 systems, I/O path construction begins with the bus converter (BUS CONV), which connects the system memory bus (SMB) and the system mid-bus. The channel adapter connects the mid-bus and the CIO bus. The logical construction concludes with the device adapter, which connects the I/O device to the CIO bus. An I/O device connects to a device adapter card through an interface cable.

Note

Since Series 950 through Series 980 systems have basically the same configuration, the examples used to demonstrate the procedures in this chapter are combined, unless otherwise specified.

An HP 3000 Series 950 through Series 980 I/O path is specified as follows:

```
BUS CONV/CA Module Number.DA Slot Number.Device Address
F
```

The bus converter specifies the number, either 2 or 6, of the interface slot which contains the adapter boards for the SMB and the mid-bus.

The CA module specifies the number of the interface slots that contain the adapter boards for the mid-bus and the CIO bus. The interface slot is assigned a numerical value of 4, 8, 16, 20, or 24.

DA CIO section slot numbers range from 0 to 4.

The address of the device itself depends on the adapter. In addition, data communications devices may have an additional logical or virtual device number in the I/O path specification.

For example, if a bus converter is 2, the CA module number is 4, the HP-IB channel CIO interface slot is 2, and the magnetic tape device address is 3, the I/O path for the tape device is 2/4.2.3.

Series 9X8LS and 9X8RX Systems

Series 9X8LX and 9X8RX systems use the HP Power Trust UPS monitor software with HP Model A2998A UPS hardware as a powerfail device. Refer to Appendix G for more information.

Adapting systems for use with HP fiber optic link (HP-FL) and interface cards

The HP 27115A Interface Card (HP-FL) is a device adapter printed circuit assembly designed for use with HP Precision Architecture computer systems that use channel input/output (CIO).

The HP-FL card provides the computer system with a high-speed serial connection to peripherals over a fiber optic data link. Device-specific data is converted to a format compatible with the CIO bus.

The high-speed data transfers of HP-FL cards require that HP-FL devices occupy the lowest-priority CIB slots; therefore, HP-IB systems may require reconfiguration to accommodate HP-FL cards. The reconfiguration also requires that the primary, secondary, and alternate boot paths be changed. Systems initially configured to accommodate HP-FL cards may not require significant modification to accept additional HP-FL cards.

Appendix D lists the default I/O paths provided for use with HP-FL systems. Contact your HP representative for additional information on using HP-FL cards in your system.

Determining I/O Paths

There are several ways to determine the I/O paths for devices that are attached to the system:

- Look at the address and physical connection of the device.
- Run the `IOMAP` utility from ISL.
- List the logical device (LDEV) numbers, paths, and classes with the SYSGEN utility IO configurator for devices that have already been configured.

SYSGEN does not indicate if the configured device is active or available. (The command `SHOWDEV` lists each configured device, and if it is `AVAILABLE`.) The `START` command is used to initiate the booting of the system, which automatically identifies the system state at boot time. The system state at boot time provides information on which paths have been configured and which drives are available.

Boot Paths and Required LDEV Numbers

When the system is powered up or reset, the processor-dependent code (PDC) and input/output-dependent code (IODC) routines read and initialize the paths needed to boot up the system. These boot paths consist of the primary boot path, for booting from disk; the alternate boot path, for booting from a boot tape; and the console boot path, for determining whether the system can autoboot without operator intervention.

At system installation, these boot paths are assigned default I/O paths, which the user may redirect either through the system initialization prompts or the initial system load (ISL) interface. For more information on system initialization and ISL, refer to chapter 3 of this manual.

Note

What SYSGEN displays depends on your system's configuration. The examples used to demonstrate IO configurator commands have been generated on a Series 925 system, unless otherwise specified, and may produce display screens that do not exactly match output from your system.

Each device configured for the boot path has been assigned a unique LDEV number. An LDEV number identifies a physical device associated with a system. Two of the paths require the assignment of a specific LDEV to the device. The system master volume must be mounted on LDEV 1 for the operating system to be booted from disk and LDEV 20 must be assigned to the system console.

Entering the IO Configurator

The command for the IO configurator is `IO`. Activate the IO configurator by entering `IO` at the SYSGEN prompt:

```
sysgen>IO

       ** IO configurator commands **

       aclass (ac)      adev (ad)       apath (ap)      avol (av)
       dclass (dc)      ddev (dd)       dpath (dp)      dvol (dv)
       lclass (lc)      ldev (ld)       lpath (lp)      lvol (lv)
       maddress(ma)     mclass (mc)     mdev (md)       mpath (mp)
       mvol (mv)

       clear (cl)(c)    exit (ex)(e)    help (he)(h)    hold (ho)
       oclose (oc)      redo

      io>
```

Example 5-1. Activating the IO Configurator

Using the IO Configurator Help Facility

The help facility enables you to identify quickly the function and syntax of those IO configurator commands and options required to perform the multiple operations that define or change device-dependent information.

To obtain a list of the commands available for use in the IO configurator, enter **HELP** at the IO configurator prompt as shown in the following example:

```
io>HELP

    ** IO configurator commands **

    aclass (ac)      adev (ad)       apath (ap)      avol (av)
    dclass (dc)      ddev (dd)       dpath (dp)      dvol (dv)
    lclass (lc)      ldev (ld)       lpath (lp)      lvol (lv)
    maddress(ma)     mclass (mc)     mdev (md)       mpath (mp)
    mvol (mv)

    clear (cl)(c)    exit (ex)(e)    help (he)(h)    hold (ho)
    oclose (oc)      redo
io>
```

Example 5-2. IO Configurator HELP Command Output

To display the syntax for each available command at the current level, enter **HELP ALL** as shown in the following example:

```
io>HELP ALL

   command (abb)   parameter=value
   -------------   ---------------

   aclass (ac)     class       = name
                   ldev        = #/#,#,...
                   [mode       = IN|OUT|CIO|NCIO|RANDOM|
                                 DEFAULT]

   adev (ad)       ldev        = #/#,#,...
                   [path        = devicepath]
                   id          = productid
                   [rsize      = recordsize]
                   [outdev     = outputdevice]
                   [mode       = JOB|DATA|INTERACTIVE|DUPLICATIVE|
                                 INPUT|OUTPUT|AUTOREPLY|NLIO|NONE]
                   [class      = classname,...|NONE]
                   [cmode      = IN|OUT|CIO|NCIO|RANDOM|
                                 DEFAULT]
                   [pmgr       = physicalmanagername]
                   [lmgr       = logicalmanagername]
                   [pmgrpri    = physicalmanagerpriority]
                   [mpetype    = compmodetype]
                   [mpesubtype= compmodesubtype]
                   [devname    = devicename]
                                 .
                                 .

   mpath (mp)      path        = devicepath
                   [id         = productid]
                   [pmgr       = managername]
                   [lmgr       = managername]
                   [pmgrpri    = managerpriority]
                   [maxios     = maxconcurrentchannelI/Os]

   mvol (mv)       vname       = volumename
                   [newname    = newvolumename]
                   [ldev       = logicaldevice#]
                   [transient = %ofdiscfortransientobjects]
                   [permanent = %ofdiscforpermanentobjects]
                   [vclass     = volumeclass]
```

Example 5-3. IO Configurator HELP ALL Command Output

To receive a listing of the syntax for an IO configurator command, enter HELP *commandname* at the IO configurator prompt as shown in the following example:

```
io>HELP ADEV

   adev (ad)        ldev        = #/#,#,...
                    path        = devicepath
                    id          = productid
                    [rsize      = recordsize]
                    [outdev     = outputdevice]
                    [mode       = JOB|DATA|INTERACTIVE| DUPLICATIVE|
                                  INPUT|OUTPUT|AUTOREPLY|NLIO|NONE]
                    [class      = classname,...|NONE]
                    [cmode      = IN|OUT|CIO|NCIO|RANDOM|
                                  DEFAULT]
                    [pmgr       = physicalmanagername]
                    [lmgr       = logicalmanagername]
                    [pmgrpri    = physicalmanager priority]
                    [mpetype    = compmodetype]
                    [mpesubtype= compmodesubtype]
                    [devname    = devicename]
io>
```

Example 5-4. IO Configurator Command HELP Output

Using IO Configurator Commands

The IO configurator commands perform four actions (list, modify, add, and delete) on four objects (classes, devices, paths, and volumes). Also, the IO configurator modifies addresses with the MADDRESS command.

The IO configurator provides commands common to all SYSGEN configurators: CLEAR, EXIT, HELP, HOLD, and OCLOSE. Table 5-1 shows a command matrix.

Table 5-1. IO Configurator Command Matrix.

	List	Modify	Add	Delete
Class	LCLASS	MCLASS	ACLASS	DCLASS
Device	LDEV	MDEV	ADEV	DDEV
Path	LPATH	MPATH	APATH	DPATH
Volume	LVOL	MVOL	AVOL	DVOL
Address		MADDRESS		

Each command has a two-character abbreviation. For a list of I/O configurator commands and their two-character abbreviations, refer to the preceding sections in this chapter.

Listing Classes, Devices, Paths, and Volumes

Prior to changing any aspect of the physical system configuration, list the actual paths and devices as they are currently configured. SYSGEN lists the information either at the user's terminal or on the printer.

There are four IO configurator commands that list objects: LCLASS, LDEV, LPATH, and LVOL.

LCLASS lists the class attribute and the association between classes and logical device numbers.

LDEV lists I/O devices.

LPATH lists I/O paths.

LVOL lists the system volume table.

Listing classes

A class name is an identifier to which numerous devices can be assigned. Unlike LDEV numbers, device class names are not unique to each device. For example, all of your system's printers could be assigned the class name LP. (LP, which stands for "line printer," is a common device class name.)

The LCLASS command (abbreviated LC) lists the class names, class modes, and the devices associated with the classes as they apply to the I/O configuration.

LCLASS has the following parameters:

```
LCLASS (LC)    [CLASS    = classname, ... ]
               [DEST     = OFFLINE]
```

The CLASSNAME parameter specifies the class that LCLASS lists. To see the assigned LDEVs of a particular device class, enter LCLASS *classname* at the IO configurator prompt:

```
io>LCLASS DISC

CLASSNAME   MODE     MIN MODE  DCC MODE  # DCC LDEV
---------   -------  --------  --------  ----  ----
DISC        default   random             0     1,2,3,21,22,
```

Example 5-5. Listing Disk Classes

Specify multiple classes by surrounding them by parentheses and separating them with commas. To list the assigned LDEV numbers of combined classes, enter LCLASS (*class1, class2*):

```
io>LCLASS (DISC,LP)

CLASSNAME   MODE     MIN MODE  DCC MODE  #DCC  LDEV
---------   -------  --------  --------  ----  -------
DISC        default   random              0    1,2,3,21,22,

LP          default   out                 0    6,
```

Example 5-6. Listing Disk and LP Classes

In the preceding example, the assigned device class is listed under CLASSNAME. MODE refers to the device operation mode.

Device operation modes are categorized and defined as follows:

Mode	Definition
IN	Input only device
OUT	Output only device
CIO	Concurrent I/O
NCIO	Nonconcurrent I/O
RANDOM	Direct access device (for example, disk)
DEFAULT	Assign at system initialization

The MODE column indicates what the user requires, the DCC (data communication configurator) mode column lists what DCC requires, and the MIN (minimum) mode column indicates what is actually used.

The *Controlling System Activity* (32650-90155) provides detailed information concerning device class names, their modes of operation, and how they are assigned in the system.

OFFLINE sends the output of the LCLASS command to SYSGEN's listing file, SYSGLIST. Using OFFLINE does not immediately generate

printed output. The information is sent to SYSGLIST until you either enter the OCLOSE command or exit SYSGEN. Exiting SYSGEN or using OCLOSE closes SYSGLIST and prints the file.

Example 5-7 demonstrates the type of output received by using LCLASS without specifying a particular class. Entering LCLASS lists all the classes assigned to all configured LDEVs as shown in the example below:

```
io>LC

CLASSNAME   MODE     MIN MODE  DCC MODE  #DCC  LDEV
---------   -------  --------  --------  ----  -------
DISC        default   random              0    1,2,3,21,22,
SPOOL       default   random              0    1,2,3,21,22,
LP          default   out                 0    6,
TAPE        default   ncio                0    7,
DDUMP       default   ncio                0    7,
JOBTAPE     default   ncio                0    10,
EPOC        default   out                 0    19,
CONSOLE     default   cio                 0    20,
BONSAI      default   out                 0    38,39,

io>
```

Example 5-7. Listing System Classes

Listing Devices

Each configured logical device (LDEV) has a uniquely assigned LDEV number. An LDEV number identifies a physical device associated with a system.

The LDEV command (abbreviated LD) lists the characteristics of the I/O devices configured for the system. If no parameters are specified, all of the I/O devices and their characteristics are listed. The LDEV command has the following parameters:

```
LDEV (LD)    [LDEV  = #/#,#,...]
             [ID    = product number]
             [TYPE  = device type]
             [CLASS = classname,...]
             [DEST  = OFFLINE]
```

All parameters are "repeated" parameters. Multiple classes, for example, can be specified by surrounding them by parentheses and separating them with commas: LDEV CLASS=(LP,EPOC).

LDEV causes only those devices with the given device specification to be listed.

The LDEV command also provides a convention for listing a range of devices. SYSGEN displays the information in the same format as in

example 5-6, except that the search key is the LDEV number rather than the device class.

To specify a consecutive range, use the following format:

LDEV *firstdevicenumber/lastdevicenumber*

Enclose nonconsecutive ranges in parentheses, separated by commas. For example:

```
io>LDEV (4/9,11/14)
```

Listing logical devices according to class or type provides output similar to the previous two examples, but each list reflects the particular information requested.

ID lists only those devices with a particular product ID. If SYSGEN does not recognize a product ID, it issues an error message. If the product does not exist in the configuration, SYSGEN issues a warning.

TYPE lists only those devices of a particular type, for example, DISC. If the type given is not USER or a valid Hewlett-Packard type, SYSGEN issues an error message. If the type does not exist in the configuration, SYSGEN issues a warning.

CLASS lists all devices associated with the specified class. If the specified class does not exist, SYSGEN issues a warning.

OFFLINE sends the output of the LDEV command to SYSGEN's listing file, SYSGLIST. Using OFFLINE does not immediately generate printed output. The information is sent to SYSGLIST until you either enter the OCLOSE command or exit SYSGEN. Exiting SYSGEN or using OCLOSE closes SYSGLIST and prints the file.

The next example demonstrates using the LDEV command on an HP 3000 Series 925 system. The information displayed will vary, depending on the configuration of your system. To list all configured devices, enter LDEV without any parameters:

```
    io>LDEV
 LDEV:     1   DEVNAME:          OUTDEV:    0  MODE:
   ID: HP7937H                   RSIZE:   128  DEVTYPE: DISC
 PATH: 4.1.0                     MPETYPE:   3  MPESUBTYPE: 10
CLASS: DISC        SPOOL

 LDEV:     2   DEVNAME:          OUTDEV:    0  MODE:
   ID: HP7937H                   RSIZE:   128  DEVTYPE: DISC
 PATH: 4.1.1                     MPETYPE:   3  MPESUBTYPE: 10
CLASS: DISC        SPOOL

 LDEV:     3   DEVNAME:          OUTDEV:    0  MODE:
   ID: HP7937H                   RSIZE:   128  DEVTYPE: DISC
 PATH: 4.1.2                     MPETYPE:   3  MPESUBTYPE: 10
CLASS: DISC        SPOOL

 LDEV:     4   DEVNAME:          OUTDEV:    0  MODE:
   ID: HP7937H                   RSIZE:   128  DEVTYPE: DISC
 PATH: 4.1.3                     MPETYPE:   3  MPESUBTYPE: 10
CLASS: DISC        SPOOL

 LDEV:     6   DEVNAME:          OUTDEV:    0  MODE:
   ID: HP2566A                   RSIZE:    66  DEVTYPE: LP
 PATH: 4.5.6                     MPETYPE:  32  MPESUBTYPE:  9
CLASS: LP

 LDEV:     7   DEVNAME:          OUTDEV:    0  MODE:
   ID: HP7980A                   RSIZE:   128  DEVTYPE: TAPE
 PATH: 4.5.3                     MPETYPE:  24  MPESUBTYPE:  5
CLASS: TAPE

 LDEV:    10   DEVNAME:          OUTDEV:   LP  MODE:  JA
   ID: HP7980A                   RSIZE:   128  DEVTYPE: TAPE
 PATH: 4.5.4                     MPETYPE:  24  MPESUBTYPE: 5

 LDEV:    20   DEVNAME:          OUTDEV:   20  MODE: JAID
   ID: HP2392A                   RSIZE:    40  DEVTYPE: TERM
 PATH: 4.2.0                     MPETYPE:  16  MPESUBTYPE:  0
CLASS: CONSOLE

 LDEV: 100/111 NMMGR

    io>
```

Example 5-8. Listing Configured Devices: Series 925 System

6

Modifying Logging Configurations

The LOG configurator enables the system manager to change the attributes of user and system logging processes.

System logging records the use of certain system resources by accounts, groups, and users on a job or session basis. The system manager determines which events are logged.

User logging allows users and subsystems to record additions and modifications to databases and other files used in applications programs. The system manager determines the maximum number of logging processes and the maximum number of users per logging process.

Entering the LOG Configurator

To access the LOG configurator, enter the LOG command (abbreviated LO) at the SYSGEN prompt as shown in the following example:

```
sysgen>LOG

        ** LOG configurator commands **

        show (sh)        slog (sl)       ulog (ul)

        clear (cl)(c)    exit (ex)(e)    help (he)(h)    hold (ho)

        oclose (oc)      redo
     log>
```

Example 6-1. Activating the LOG Configurator

Using the LOG Configurator Help Facility

The help facility enables you to quickly identify the function and syntax of those LOG configurator commands and options for performing the multiple operations that define or change logging processes.

To obtain a list of the commands available for use in the LOG configurator, enter **HELP** at the LOG configurator prompt as shown in the following example:

```
log>HELP

    ** LOG configurator commands **

    show (sh)        slog (sl)       ulog (ul)

    clear (cl)(c)    exit (ex)(e)    help (he)(h)    hold (ho)

    oclose (oc)      redo

log>
```

Example 6-2. LOG Configurator Help

To display the syntax for each available command, enter **HELP ALL** as shown in the following example:

```
log>HELP ALL

   command (abb)  parameter=value
   -------------  ---------------

   show (sh)      [command      = SLOG|ULOG|ALL]
                  [dest         = OFFLINE]

   slog (sl)      [on           = event#,...]
                  [off          = event#,...]

   ulog           [nlogprocs    = number processes allowed]
                  [usersperproc = users per logging process]

log>
```

Example 6-3. LOG Configurator HELP ALL

Entering HELP *commandname* provides help for a specific command:

```
log>HELP SHOW

show (sh)       [command       = SLOG|ULOG|ALL]
                [dest          = OFFLINE]
```

Showing Current LOG Values

The SHOW command displays the LOG values as currently set.

SHOW has the following parameters:

```
SHOW    [COMMAND =  SLOG   .]
                    ULOG    ]
                    ALL     ]
        [DEST    =  OFFLINE ]
```

SLOG lists the state of the system logging events.

ULOG lists the number of user logging processes and users per logging process currently configured.

ALL lists all the information associated with the LOG configurator.

OFFLINE redirects the output of the SHOW command to the SYSGEN listing file, SYSGLIST. Using OFFLINE does not immediately generate a printout. The information is sent to SYSGLIST until you either enter the OCLOSE command or exit the configurator. Exiting the configurator or using OCLOSE closes SYSGLIST and prints the file.

Using SHOW without using any parameters, is the same as specifying SHOW ALL. In addition, the value entered for the ULOG parameter includes the minimum, maximum, current, and default values.

To show the current user logging process, enter SHOW ULOG:

```
log>SHOW ULOG
        configurable item              max      min    current
        -----------------             -------  -------  -------
        # of user logging processes     128       2     64
        # users per logging process     1024      1     128
```

Example 6-4. Showing User Logging Processes

To view all currently configured values, enter SHOW ALL:

```
log>SHOW ALL
        configurable item              max      min    current
        -----------------             -------  -------  -------
        # of user logging processes     128        2    64
        # users per logging process     1024       1    128

        system log events              event #       status
        -----------------              -------       ------
        System Logging                   100           ON
        System Up                        101           ON
        Job Initiation                   102          OFF
        Job Termination                  103          OFF
        Process Termination              104          OFF
        NM File Close                    105          OFF
        System Shutdown                  106           ON
        Power Failure                    107           ON
        I/O Error                        111           ON
        Physical Mount/Dismount          112          OFF
        Logical Mount/Dismount           113          OFF
        Tape Label                       114          OFF
        Console Log                      115           ON
        Program File Event               116           ON
        Native Mode Spooling             120           ON
        Chdir                            127          OFF
        Process Adoption                 128          OFF
        File Owner Change                129          OFF
        Architected Interface            130          OFF
        Additional Processor Launch      131           ON
        Password Change                  134          OFF
        System Logging Configuration     135          OFF
        Restore                          136           ON
        Printer Access Failure           137          OFF
        ACD Change                       138           ON
        Stream Initiation                139           ON
        User Logging                     140           ON
        Process Creation                 141          OFF
        Security Configuration Change    142          OFF
        Chgroup                          143           ON
        File Open                        144          OFF
        CI Command Logging               145          OFF
        Maintenance Request              146          OFF
        UPS Monitor Event Logging        148          OFF
        Diagnostic Information           150           ON
        High Priority Machine Check      151           ON
        Low Priority Machine Check       152           ON
        Directory Open/Close Logging     155          OFF
        CM File Close                    160          OFF
```

Example 6-5. Showing All Configured Values

Logging System Events

System logging records the use of certain resources by accounts, groups, and users. System logging can be used for several purposes, such as billing or obtaining an overview of system use. System logging describes system use by creating a running log of actual events, correlating the event with a job and session. The system manager chooses which events to enable or disable by setting an event number to ON or OFF. (Refer to the preceding example for a list of event numbers and their definitions.)

The SLOG command enables and disables the selected system logging events. SLOG has the following parameters:

```
SLOG (SL)    [ON  = event#, ... ]
             [OFF = event#, ... ]
```

Enable the logging of an event by entering SLOG *event#, ...* :

```
log>SLOG 100        (Event 100 enabled)
```

or

```
log>SLOG ON=100     (Event 100 enabled)
```

Disable the logging of an event by entering SLOG OFF=*event#, ...* :

```
log>SLOG OFF=100    (Event 100 disabled)
```

Entering SLOG without ON enables logging. Entering SLOG without an event number causes an error:

```
log>SLOG

(error - no parameters are specified)''
```

Logging event 100 is a special case. If 100 is off, no logging (except that forced on by MPE/iX) takes place.

Note

Some events are permanently set to ON. Currently, events 101, 111, 135, 146, and 150 are forced on by MPE/iX.

Logging User Events

User logging provides a means for system users and subsystems to record additions and modifications to databases and other files using application programs. The system manager determines the maximum number of logging processes and the maximum number of users per logging process.

The ULOG command configures the user logging process parameters. ULOG has the following parameters:

ULOG (UL) [NLOGPROCS = *numberprocesses allowed*]

[USERSPERPROC = *usersperloggingprocess*]

NLOGPROCS controls the user logging ID (LID) table size. Lowering NLOGPROCS loses all current logging ID information from the tape created by SYSGEN. If NLOGPROCS remains unchanged or increases, the current logging ID information is copied to tape. The minimum and maximum number of processes allowed are 2 and 128, respectively.

USERSPERPROC specifies the maximum number of users assigned to each configured logging process. The minimum and maximum number of users per logging process are 1 and 1024, respectively.

Note

Changing NLOGPROCS takes effect when a tape is created and an UPDATE CONFIG or INSTALL is conducted. Refer to Chapter 3 for information on installing or updating the operating system.

To set the number of processes or users per process, enter ULOG followed by the number of processes or users:

```
log>ULOG 40  ** Number of Processes **
```

or

```
log>ULOG USERSPERPROC=40  ** Number of Users per Process **
```

Clearing Log Configuration Changes

If you desire to clear all LOG configuration changes made, enter the CLEAR command at the LOG configurator prompt.

```
log>CLEAR
```

Once a SYSGEN> KEEP is done, the changes kept become permanent and CLEAR does not remove them.

Holding and Saving Configuration Changes

Using the system logging and user logging commands described in the following sections changes the LOG configuration specified in the SYSGEN command line or global **BASEGROUP** command. These changes are temporary and are easily lost if not properly saved.

Saving configuration changes is a two-step procedure. After you alter a configuration, you must, first, hold the changes before exiting the configurator. Second, use the global module **KEEP** command to save the changes.

To hold changes, enter the **HOLD** command at the LOG configurator prompt:

```
log>HOLD
```

You can work in a SYSGEN configurator, hold the changes, and continue working in other SYSGEN configurators before saving the changes.

To save the changes, hold all desired changes, exit to SYSGEN's global module, and issue the **KEEP** command:

```
sysgen>KEEP newgroupname
```

Refer to Chapter 4 for additional information on using the **KEEP** command.

Entering an MPE Command from the LOG Configurator

Use the colon (:) to introduce an MPE command from the LOG configurator. To issue an MPE command, enter the command along with the colon. For example,

```
      log>:SHOWTIME
THU, APR 20, 1989,  2:55PM
      log>
```

Exiting the LOG Configurator

Use the EXIT command to terminate the LOG configurator and return to the SYSGEN global module. Exit may be abbreviated EX or E. To end working in the LOG configurator, enter EXIT at the LOG configurator prompt:

```
log>EXIT

sysgen>
```

Printing a Log File

To analyze your logs and to read what you are logging, you must print your log files. To do this, use the LOGTOOL utility program. The LOGTOOL utility runs under the online diagnostic system, and can be invoked by entering SYSDIAG. When the diagnostic user interface prompt (DUI>) appears, enter RUN LOGTOOL.

In order to print a log, issue the following:

1. :SYSDIAG
2. DUI>RUN LOGTOOL
3. LOGTOOL>LIST LOG=*log#* OUTFILE=LP
4. LOGTOOL>EXIT
5. DUI>EXIT

Enter HELP after the LOGTOOL prompt for more information. The STATUS command reports on the status of all system log files.

The following example shows the use of the STATUS command in the sequence of printing a log.

```
:SYSDIAG
DUI >RUN LOGTOOL
LOGTOOL>status
LOGTOOL>list log=0027 outfile=LP
DUI >EXIT
```

If you do not specify the OUTFILE parameter, the log prints on your terminal screen. Typically this report is very long and ties up your terminal for quite some time. If this does happen, you can enter CTRL Y to break the process.

Printing a subset of a log file

If you like, you can filter the output of LOGTOOL utility to show you information about only a specific user or users. The syntax for this is shown below.

```
LIST { LOG=log_name } [ ;JSNAME=job/session_name ]
                      [ ;USER=user_name          ] [ ... ]
                      [ ;ACCOUNT=account_name    ]
```

The input for these commands should be no longer than 80 characters. Default for all parameters is the wildcard @.

For example, to select log records from log files 1 through 5, with log information about password changes (log type 134), and user identification JTEST,MARIA.PAYROLL, you would enter the following.

```
>LIST LOG=1/5;TYPE=134;JSNAME=JTEST;USER=MARIA;ACCOUNT=PAYROLL
```

This selection option is valid for the log types listed below:

102 Job Initiation
103 Job Termination
104 Process Termination
105 NM File Close (also 160)
108 Spooling Log
112 Physical Mount/Dismount
113 Logical Mount/Dismount
114 Tape Label
115 Console Log
116 Program File Event
120 Native Mode Spooling
130 Architected Interface
134 Password Change
135 System Logging Configuration
136 Restore
137 Printer Access Failure
138 ACD Change
139 Stream Initiation
140 User Logging
141 Process Creation
143 Chgroup
144 File Open

7

Modifying Miscellaneous Configuration Elements

The MISC configurator provides commands to configure various types of file information difficult to categorize elsewhere. The MISC configurator handles changes to job-related and session-related items, processes, system resource allocations, spool parameters, stack and heap sizes, and miscellaneous system information.

Entering the MISC Configurator

To access the MISC configurator, enter the `MISC` command (abbreviated `MI`) at the SYSGEN prompt.

```
sysgen>MISC

       ** MISC configurator commands **

       drin (dr)        io              job (jo)       lrin (lr)
       resource (re)    session (se)    show(sh)       stack (st)
       system (sy)

       clear (cl)(c)    exit (ex)(e)     help (he)(h)    hold (ho)
       oclose (oc)      redo
misc>
```

Example 7-1. Activating the MISC Configurator

Using the MISC Configurator Help Facility

The help facility enables you to identify quickly the function and syntax of MISC configurator commands.

To obtain a list of the commands available for use in the MISC configurator, enter HELP at the MISC configurator prompt.

```
misc>HELP

     ** MISC configurator commands **

     drin (dr)        io              job (jo)        lrin (lr)
     resource (re)    session (se)    show(sh)        stack (st)
     system (sy)

     clear (cl)(c)    exit (ex)(e)     help (he)(h)    hold (ho)
     oclose (oc)      redo
misc>
```

Example 7-2. MISC Configurator HELP

Entering HELP ALL produces a list of all MISC configurator commands and syntax. Example 7-3 displays the output.

```
misc>HELP ALL

     commands (abb)   parameter=value
     --------------   ---------------

     drin (dr)        global          = global-rin#,...

     io (io)          [maxdyninput    = dynamic input devs]
                      [maxdynoutput   = dynamic output devs]
                      [maxdynio       = dynamic I/O devs]

     job (jo)         [cputime        = second-count]
                      [maxlimit       = maximum job limit]
                      [pool           = pool-size]

     lrin (lr)        [dest           = OFFLINE]

     resource (re)    [grins          = global-rin-allocation]
                      [rins           = total-rin-allocation]
                      [iomont         = io-monitor-table size]
                      [maxcmcode      = cm code segment size]
                      [cmsegs         = cm code segs per proc]
                      [maxxdata       = max size of xdata seg]
                      [xdataperproc   = max data segs/proc]

     session (se)     [maxlimit       = maximum session limit]
                      [logontimeout   = time in seconds]
                      [citimeout      = time in minutes]
                      [pool           = pool-size]

     show (sh)        [command        = JOB|RESOURCE|SESSION|
                                        STACK|SYSTEM|ALL
                      [dest           = OFFLINE]

     stack (st)       [nm             = default nm stack size]
                      [maxnm          = max size of nm stack]
                      [cm             = default cm stack size]
                      [maxcm          = max size of cm stack]
                      [heap           = default heap size]
                      [maxheap        = max size of nm heap]

     system (sy)      [userversion          = x.yy.zz]
                      [logonprompt          = max-255-characters]
                      [ciprompt             = max-255-characters]
                      [enforcelogonudcs      = ON|OFF]
```

Example 7-3. MISC Configurator HELP ALL Output

You can request help for a specific MISC configurator command by entering HELP *commandname* at the MISC configurator prompt:

```
misc>HELP RESOURCE

   resource (re)     [grins         = globalrinallocation]
                     [rins          = totalrinallocation]
                     [iomont        = iomonitortablesize]
                     [maxcmcode     = cmcodesegmentsize]
                     [cmsegs        = cmcodesegsperproc]
                     [maxxdata      = maxsizeofxdataseg]
                     [xdataperproc = maxdatasegsproc]
```

Showing Values of Current Configurable Items

The SHOW command, abbreviated SH, displays the values of the current configurable items referenced by it. SHOW has the following parameters:

```
SHOW (SH)    [ [COMMAND =] [ IO       ]
                           [ JOB      ]
                           [ RESOURCE ]
                           [ SESSION  ]
                           [ STACK    ]
                           [ SYSTEM   ]
                           [ ALL      ]
             [ [DEST    =]   OFFLINE  ]
```

JOB displays the job-related limits and default operating points. The displayed information includes: the CPU time limit for batch jobs, the maximum system job limit, and the number of preinitialized job processes (POOL). Refer to the *MPE/iX Commands Reference Manual Volumes 1 and 2* (32650-90003 and 32650-90364) for information on the JOB command.

Each of the remaining parameters has a corresponding command defined in this chapter.

RESOURCE displays system resource allocation values.

SESSION displays the session-related limits of the system and the default operating points.

STACK displays the sizes of the NM stack, CM stack, and the heap.

SYSTEM displays the settings of various system resource values, the system ID, and logon and command interpreter prompts.

ALL lists all of the information described above.

OFFLINE redirects the output of the SHOW command to the SYSGEN listing file, SYSGLIST. Using OFFLINE does not immediately generate a printout. The information is sent to SYSGLIST until you either

enter the OCLOSE command or exit the configurator. Exiting the configurator or using OCLOSE closes SYSGLIST and prints the file.

Entering SHOW without a parameter is the same as specifying SHOW ALL, which lists all current values. To see the resources allocated through the MISC configurator, enter SHOW or SHOW ALL at the MISC configurator prompt.

Example 7-4demonstrates the output from SHOW ALL:

```
misc>SHOW ALL

   IO command            parameter      MAX       MIN      CURRENT
   ------------------    ---------    -------   -------   -------
   DYNAMIC INPUT DEVS    maxdyninput      999         0         2
   DYNAMIC OUTPUT DEVS   maxdynoutput     999         0         4
   DYNAMIC IO DEVS       msxdynio         999         0       332

   JOB command           parameter      MAX       MIN      CURRENT
   ------------------    ---------    -------   -------   -------
   DEFAULT CPU LIMIT     cputime        32767         0         0
   MAXIMUM LIMIT         maxlimit         999         0        60
   POOL SIZE             pool             200         1         1

   RESOURCE command      parameter      MAX       MIN      CURRENT
   ------------------    ---------    -------   -------   -------
   GLOBAL RIN LIMIT      grins           1365         0        48
   TOTAL RIN LIMIT       rins            5459         5       150
   IOMONT LIMIT          iomont           100        10        20
   MAX CM CODE SIZE      maxcmcode      16384      1024     16384
   CM SEGS PER PROC      cmsegs           255         1        63
   MAX XDATA             maxxdata       32764         0     32764
   MAX XDATA PER PROC    xdataperproc     255         0       255

   SESSION command       parameter      MAX       MIN      CURRENT
   ------------------    ---------    -------   -------   -------
   MAXIMUM LIMIT         maxlimit         999         1        60
   SECONDS TO LOGON      logontimeout     600        10       180
   CI TIMEOUT (MIN)      citimeout        546         0         0
   POOL SIZE             pool             200         1         1
```

Example 7-4. MISC Configurator SHOW ALL Output

```
STACK command          parameter       MAX         MIN       CURRENT
-----------------      ---------     -------     -------     -------
DEFAULT NM STACK       nm             262144      262144      262144
MAXIMUM NM STACK       maxnm      1068498944      262144      262144
DEFAULT CM STACK       cm               4096         256        1200
MAXIMUM CM STACK       maxcm           31232         256       31232
DEFAULT HEAP           heap           524288      524288  524288
MAXIMUM NM HEAP        maxheap        524288      524288 524288

SYSTEM command         parameter         VALUE
--------------         ---------         -----
USER VERSION           userversion       X.50.10
LOGON PROMPT           logonprompt       MPE/iX:
CI PROMPT              ciprompt          :
RELEASE                                  X.50.10
ENFORCE LOGON UDCS     enforcelogonudcs  OFF
```

Example 7-4 MISC Configurator SHOW ALL Output (continued)

Example 7-5 demonstrates using the SHOW command to see the values allocated to a particular parameter:

```
misc>SHOW JOB

      JOB command          parameter       MAX         MIN       CURRENT
-----------------          ---------     -------     -------     -------
DEFAULT CPU LIMIT          cputime         32767           0           0
MAXIMUM LIMIT              maxlimit          999           0          60
POOL SIZE                  pool              200           1           1
```

Example 7-5. MISC Configurator SHOW Output

Deleting Global Resource Identification Numbers (RIN)

A resource identification number (RIN) identifies a user-defined resource. A RIN allows a user to exclusively access resources including I/O devices, disk files, and programs.

The DRIN command (abbreviated DR) removes allocated global resource identification numbers. DRIN has the following parameter:

```
DRIN (DR)    [GLOBAL    =] global-rin number
```

To delete a global RIN or a range of global RINs, enter DRIN and the RIN at the MISC configurator prompt:

```
misc>DRIN 4                    ** Deletes single RIN **

misc>DRIN (1,2,3,4,15,84)   ** Deletes group of RINs **
```

The changes made using the DRIN command take effect only if a tape containing the changes is generated and the newly created tape is used to update the configuration or install the system.

Configuring Job-Related Limits

The JOB command (abbreviated JO) configures job-related limits and default operating modes. JOB has the following parameters:

```
JOB (JO)    [CPUTIME    = secondcount ]
            [MAXLIMIT   = maximumjoblimit ]
            [POOL       = poolsize ]
```

CPUTIME sets the default CPU time limit for batch jobs.

MAXLIMIT sets the maximum job limit that may be set through the LIMIT command.

POOL is the number of precreated JSMAIN processes ready to be used when someone logs on.

Table 7-1 shows the minimum and maximum numbers for the JOB command parameters:

Table 7-1.
Minimum and Maximum Values for JOB Command Parameters

Parameter	Minimum	Maximum
CPUTIME	0	32767
MAXLIMIT	0	2700
POOL	1	200

To change a job-related parameter value, enter the JOB command and at least one parameter to change:

```
misc>JOB CPUTIME=500  ** Using Keyword Parameter   **

misc>JOB 5 8 150      ** Using Position Parameters **
```

In the preceding example, the first command sets the CPU execution time to 500 seconds. The second command sets the CPU execution time to 5 seconds, the maximum job limit to 8, and the pool size to 150.

Displaying Allocated Global RINs

The LRIN command (abbreviated LR) displays allocated global RINs that are currently allocated either to the console or offline. LRIN has the following parameter:

```
LRIN (LR)    [[DEST    =] OFFLINE ]
```

OFFLINE redirects the output of the LRIN to the SYSGEN listing file, SYSGLIST. Using OFFLINE does not immediately generate a printout. The information is sent to SYSGLIST until you either enter the OCLOSE command or exit the configurator. Exiting the configurator or using OCLOSE closes SYSGLIST and prints the file.

To display the RIN ownership on the console screen, enter LRIN without a parameter:

```
misc>LRIN

 rin    username
----  ---------------
 3    MANAGER .SYS
 148  MANAGER .QASYS
 149  MANAGER .QASYS
 150  MANAGER .QASYS
```

Note

This example may vary depending on which system you have.

Setting Resource Allocations

The RESOURCE command (abbreviated RE) sets system resource allocations. RESOURCE has the following parameters:

```
RESOURCE (RE)     [GRINS          = global-rin-allocation]
                  [RINS           = total-rin-allocation]
                  [IOMONT         = io-monitor-table-size]
                  [MAXCMCODE      = cm code segment size]
                  [CMSEGS         = cm code segs per proc]
                  [MAXXDATA       = max size of xdata seg]
                  [XDATAPERPROC = max data segs/proc]
```

GRINS sets the number of global RINs to be allocated.

RINS sets the total number of global and local RINs to be allocated.

IOMONT sets the size of the I/O monitor area.

MAXCMCODE sets the maximum CM code segment size allowed for any given process.

MAXXDATA sets the maximum extra data segment size allowed.

XDATAPERPROC sets the maximum number of extra data segments for any given process.

Note

Changes to GRINS and RINS take effect only if a tape containing the changes is generated and the newly created tape is used to update the configuration or install the system.

Table 7-2 shows the minimum and maximum values for the RESOURCE command parameters.

Table 7-2.
Minimum and Maximum Values for RESOURCE Parameters

Parameter	Minimum	Maximum
GRINS	1	1365
RINS	5	5459
IOMONT	10	100
MAXCMCODE	1024	16384
CMSEGS	1	255
MAXXDATA	0	32764
XDATAPERPROC	0	255

To set one of the system resource allocations, enter the RESOURCE command and at least one parameter that is to change:

```
misc>RESOURCE GRINS=40          ** Keyword **

misc>RE,,80 1024                ** Positional **

misc>RE 50,,80 1024 CMSEGS=50   ** Combination **
```

Note Setting IOMONT too low (below 10) prevents the system from booting.

Setting Session-Related Limits

The SESSION command (abbreviated SE) configures session-related limits and default operating points. SESSION has the following parameters:

```
SESSION (SE)   [MAXLIMIT      = maximum session limit]
               [LOGONTIMEOUT  = time in seconds]
               [CITIMEOUT     = time in minutes]
               [POOL          = pool-size]
```

MAXLIMIT sets the maximum session limit.

LOGONTIMEOUT sets the number of seconds a user has to log on to the system.

CITIMEOUT sets the number of minutes a user may be inactive at the terminal before being automatically logged off the system. A value of zero prevents automatic log off.

POOL is the number of precreated JSMAIN processes ready to be used when someone logs on.

Table 7-3 show the minimum and maximum values for SESSION command parameters.

Table 7-3.
Minimum and Maximum Values for SESSION Parameters

Parameter	Minimum	Maximum
MAXLIMIT	1	2700
LOGONTIMEOUT	10	2700
CITIMEOUT	0	546
POOL	1	200

To configure a session-related limit, enter the SESSION command and at least one parameter to change. Here are three examples of the SESSION command. They show parameters in keyword, positional, and in combination formats, respectively.

```
misc>SESSION MAXLIMIT=80 LOGONTIMEOUT=300
```

```
misc>SE 200 150,,8

misc>SE 200 10 POOL=8
```

Setting Sizes of Native Mode and Compatibility Mode Stacks

The STACK command (abbreviated ST) configures the default sizes of the NM and CM stacks and the heap. STACK has the following parameters:

```
STACK (ST)    [NM      = default nm stack size]
              [MAXNM   = max size of nm stack size]
              [CM      = default cm stack size]
              [MAXCM   = max size of cm stack]
              [HEAP    = default nm heap-size]
              [MAXHEAP = max size of nm heap]
```

NM sets the default NM stack size, which is expressed in bytes. The **NM** value must be less than the values of **MAXNM** (see below).

MAXNM sets the maximum NM stack size, which is expressed in bytes.

CM sets the default CM stack size, which is expressed in words (16 bits in length). The value set for the **CM** parameter must be less than the value set for the **MAXCM** parameter (see below).

MAXCM sets the maximum allowable CM stack size.

HEAP sets the default heap size, which is expressed in bytes. The value must not exceed **MAXHEAP** (see below).

MAXHEAP sets the maximum heap size, which is expressed in bytes.

To change one of the STACK parameters, enter the STACK command and at least one parameter to change. Here are two examples. The first is keyword and the second is positional.

```
mi>STACK NM=262144 CM=4096

mi>STACK 262144 262144,,20000
```

Table 7-5 shows the minimum and maximum values of the STACK command parameters.

Table 7-4. Min. and Max. Values for STACK Parameters

Parameter	Minimum	Maximum
NM	262144	1068498944
MAXNM	262144	1068498944
CM	256	4096
MAXCM	256	31232
HEAP	524288	1068498944
MAXHEAP	524288	1068498944

Setting Strings and String Parameters

The SYSTEM command (abbreviated SY) sets various strings and parameters. SYSTEM has the following parameters:

```
SYSTEM (SY)   [ [USERVERSION =] x.yy.zz]
              [ [LOGONPROMPT =] prompt string]
              [ [CIPROMPT    =] prompt string]
```

USERVERSION allows the system manager to identify the system with a version meaningful to your environment. This might identify some conbination of third-party products.

LOGONPROMPT sets the system prompt.

CIPROMPT sets the prompt used by the command interpreter.

Table 7-6 shows the default values for the SYSTEM command parameters:

Table 7-5. Default Values for SYSTEM Parameters

Parameter	Value
USERVERSION	A.50.00
PROMPT	MPE/iX:
CIPROMPT	:

To set one of the parameters relating to the SYSTEM command, enter the command and at least one parameter to change. Here are two examples of the keyword and positional formats:

```
misc>SYSTEM USERVERSION=A.A1.35

misc>SYSTEM A.A1.35 150:
```

Note

A changed USERVERSION, as in the previous example, is lost if the MISC configurator information is saved to the group CONFIG.SYS. The ID information is retained if it is saved to any group other than CONFIG.SYS. To change user version, generate a system load tape (SLT) and update with it.

Clearing MISC Configuration Changes

If you desire to clear all MISC configuration changes made, enter the CLEAR command at the MISC configurator prompt.

```
misc>CLEAR
```

Once a SYSGEN> KEEP is done, the changes become permanent and CLEAR does not remove them.

Holding and Saving Configuration Changes

Using the MISC configurator commands described in the previous sections changes the configuration specified in the SYSGEN command line or global BASEGROUP command. These changes are temporary and are lost if not properly saved.

Saving configuration changes is a two-step procedure. After you alter a configuration, you must first hold the changes before exiting the configurator. Second, use the global module KEEP command to save the changes.

To hold changes, enter the HOLD command at the MISC configurator prompt:

```
misc>HOLD
```

You can work in a SYSGEN configurator, hold the changes, and continue working in other SYSGEN configurators before saving the changes.

To save the changes, first hold all desired changes, exit to SYSGEN's global module, and issue the KEEP command:

```
sysgen>KEEP newgroupname
```

For additional information on using the KEEP command, refer to Chapter 4.

Entering an MPE Command from the MISC Configurator

Use the colon (:) to introduce an MPE command while in the MISC configurator. To issue an MPE command, enter the command along with the colon. For example:

```
misc>:SHOWTIME
THU, APR 20, 1989,  2:55PM
misc>
```

Exiting the MISC Configurator

Use the **EXIT** command to terminate the MISC configurator and return to the SYSGEN Global module. **EXIT** may be abbreviated **EX** or **E**. To end working in the MISC configurator, enter **EXIT** at the MISC configurator prompt:

```
misc>EXIT

sysgen>
```

8

Modifying System File Configurations

The SYSFILE configurator enables the system manager to change system libraries, programs, and the system message catalog. The changes are made to a list of the files. SYSFILE has many of the features of the IO configurator that permit the user to add, delete, and replace objects through a series of related commands.

Note

In order for SYSFILE configurator changes to become permanent, you must generate a boot tape. Update or install the system with the newly created boot tape to implement the changes.

Entering the SYSFILE Configurator

Example 8-1 demonstrates activating the SYSFILE configurator. To access the SYSFILE configurator, enter the SYSFILE command (abbreviated SY) at the SYSGEN prompt:

```
sysgen>SY

      ** SYSFILE configurator commands **

      aauto (aa)      aboot (ab)      acmsl (ac)      asprog (as)
      cmsl (cm)       dauto (da)      dboot (db)      dcmsl (dc)
      dsprog (ds)     lcmsl (lc)      rauto (ra)      rboot (rb)
      rcat (rc)       rcmsl (rcm)     rdcc (rd)       ripl (ri)
      rnmlib (rn)     rsprog (rs)     show (sh)

      clear (cl)(c)   exit (ex)(e)    help (he)(h)    hold (ho)
```

Example 8-1. Activating the SYSFILE Configurator

For additional information on entering the SYSFILE configurator, refer to Chapter 4.

Using the SYSFILE Configurator Help Facility

The help facility enables you to identify quickly the function and syntax of SYSFILE configurator commands and options.

The help facility operates similarly to the global help facility. Example 8-2 demonstrates using the SYSFILE configurator's help facility to list all available SYSFILE commands. To obtain the list of commands, enter HELP at the SYSFILE configurator prompt:

```
sysfile>HELP

       ** SYSFILE configurator commands **

       aauto (aa)      aboot (ab)      acmsl (ac)      asprog (as)
       cmsl (cm)       dauto (da)      dboot (db)      dcmsl (dc)
       dsprog (ds)     lcmsl (lc)      rauto (ra)      rboot (rb)
       rcat (rc)       rcmsl (rcm)     rdcc (rd)       ripl (ri)
       rnmlib (rn)     rsprog (rs)     show (sh)

       clear (cl)(c)   exit (ex)(e)    help (he)(h)    hold (ho)
```

Example 8-2. SYSFILE Configurator HELP

Example 8-3 demonstrates using the SYSFILE configurator's help facility for listing all SYSFILE commands and their syntax. To display the syntax for each available command at the current level, enter HELP ALL:

```
sysfile>HELP ALL

        commands (abb)  parameter=value
        --------------  ---------------
        aauto (aa)      file      = filename
                        type      = DISC|TAPE|BOTH
        aboot (ab)      image     = boot image name
                        file      = filename
                        type      = DISC|TAPE|BOTH
        acmsl (ac)      seg       = segment-name
                        file      = filename
                        [mode     = S|C|P|U]
        asprog (as)     prog      = program-name
                        file      = filename
        cmsl (cm)       [sl       = sl-name]
        dauto (da)      type      = DISC|TAPE|BOTH
        dboot (db)      image     = boot-image-name,...
        dcmsl (dc)      seg       = segment-name,...
        dsprog (ds)     prog      = program-name,...
        lcmsl (lc)      [seg      = segment-name]
        rauto (ra)      file      = autoboot filename
                        type      = DISC|TAPE|BOTH
        rboot (rb)      image     = boot-image-name
                        file      = filename
                        type      = DISC|TAPE|BOTH
        rcat (rc)       name      = filename
        rcmsl (rcm)     seg       = segment-name
                        file      = filename
                        [mode     = S|C|P|U]
        rdcc (rd)       file      = filename
        ripl (ri)       image     = IPL image name
                        file      = IPL file name
                        type      = DISC|TAPE|BOTH
        rnmlib (rn)     file      = filename
        rsprog (rs)     prog      = program-name
                        file      = filename
        show (sh)       [file     = AUTO|BOOT|CATALOG|CMSL|DCC|IPL
                                    NMLIB|SPROG|ALL]
                        [dest     = OFFLINE]
```

Example 8-3. SYSFILE Configurator HELP ALL

To request help for a specific SYSFILE configurator command, enter HELP *commandname* at the SYSFILE configurator prompt:

```
sysfile>HELP ABOOT

        aboot (ab)      image      = boot image name
                        file       = filename
                        type       = DISC|TAPE|BOTH
sysfile>
```

Example 8-4. SYSFILE Configurator HELP ABOOT

Using SYSFILE Configurator Commands

The SYSFILE configurator commands perform five actions (add, delete, replace, list, and specify) on eight objects (autoboot image, boot image, compatibility mode segmented library (CMSL), system program, system catalog, network configuration (NETWORK CONFIG), initial program loader (IPL) image, and native mode library (NM LIBRARY)). In addition, the SYSFILE configurator provides other commands, some of which are common to other SYSGEN configurators: CLEAR, EXIT, HELP, HOLD, OCLOSE, and the colon (:).

Table 8-1 shows a command matrix of the add, delete, replace, list, and specify commands. The objects are listed from top to bottom, and the actions are listed from left to right.

Table 8-1. SYSFILE Configurator Command Matrix

	ADD	DELETE	REPLACE	LIST	SPECIFY
AUTO BOOT IMAGE	AAUTO	DAUTO	RAUTO		
BOOT IMAGE	ABOOT	DBOOT	RBOOT		
CM SL SEGMENT	ACMSL	DCMSL	RCMSL	LCMSL	CMSL
SYSTEM PROGRAM	ASPROG	DSPROG	RSPROG		
SYSTEM CATALOG			RCAT		
NETWORK CONFIG			RDCC		
IPL IMAGE			RIPL		
NM LIBRARY			RNMLIB		

All commands have a two- or three-character abbreviation.

Note

The examples used to demonstrate SYSFILE configurator commands may produce display screens that do not exactly match output from your system. What SYSGEN displays depends entirely on how your system is configured.

Caution

Do not use the `SYSFILE> RSPROG` command to rename Hewlett-Packard supplied MPE/iX HP 3000 system files. A renamed system file can corrupt your system during an update. This problem can occur if you have third party software installed on your system and you have renamed some system files to use this software.

Use the `SHOW` command in SYSFILE to ensure that all Hewlett-Packard supplied system files have retained their original name. System filenames in both columns should be identical. If they are not identical, rename the files in the second column to the filename in the first column.

Displaying Current File Information

The SHOW command (abbreviated SH) displays the file information currently set through SYSFILE. SHOW has the following parameters:

```
SHOW (SH)    [FILE =  AUTO    ]
                      [ BOOT    ]
                      [ CATALOG ]
                      [ CMSL    ]
                      [ DCC     ]
                      [ IPL     ]
                      [ NMLIB   ]
                      [ SPROG   ]
                      [ ALL     ]
             [DEST =  OFFLINE ]
```

AUTO shows all the autoboot images.

BOOT shows all the boot images currently configured.

CATALOG shows the system catalog in use.

CMSL shows the CMSL (compatibility mode segmented library) in use.

DCC shows which file will be used for network configuration.

IPL shows the IPL images in use.

NMLIB shows the NM library names.

SPROG shows the specified system program names.

ALL shows all of the above information.

OFFLINE redirects the output of the SHOW command to SYSGEN's listing file, SYSGLIST. Using OFFLINE does not immediately generate a printout. The information is sent to SYSGLIST until you either enter the OCLOSE command or exit SYSGEN. Exiting SYSGEN or using OCLOSE closes SYSGLIST and prints the file.

To see current file information, enter the SHOW command and at least one parameter:

```
sysfile>SH NMLIB

NM LIB       = NL.PUB.SYS
```

To show all the current system file information for system libraries, programs and the message catalog, enter SHOW ALL or SHOW:

```
sysfile>SHOW ALL
        DISC AUTOBOOT  = NONE
        TAPE AUTOBOOT  = NONE
        SYSTEM CATALOG = CATALOG.PUB.SYS
        CM SL          = SL.PUB.SYS
        NMCONFIG FILE  = NONE
        NM LIB         = NL.PUB.SYS

BOOT FILE                FILENAME                 TYPE
---------                --------                 ----
ISL.MPEXL.SYS            ISL.MPEXL.SYS            disc boot
DUMP.MPEXL.SYS           DUMP.MPEXL.SYS           disc boot
START.MPEXL.SYS          START.MPEXL.SYS          disc boot
INSTALL.MPEXL.SYS        INSTALL.MPEXL.SYS        tape boot
UPDATE.MPEXL.SYS         UPDATE.MPEXL.SYS         tape boot
A1002AI.MPEXL.SYS        A1002AI.MPEXL.SYS        both boot
A1002AM.MPEXL.SYS        A1002AM.MPEXL.SYS        both boot
A1002AP.MPEXL.SYS        A1002AP.MPEXL.SYS        both boot
A1100AI.MPEXL.SYS        A1100AI.MPEXL.SYS        both boot
A1100AM.MPEXL.SYS        A1100AM.MPEXL.SYS        both boot
A1100AP.MPEXL.SYS        A1100AP.MPEXL.SYS        both boot
CAEXR.MPEXL.SYS          CAEXR.MPEXL.SYS          both boot
IOMAP.MPEXL.SYS          IOMAP.MPEXL.SYS          both boot
CLKUTIL.MPEXL.SYS        CLKUTIL.MPEXL.SYS        both boot
DISCUTIL.MPEXL.SYS       DISCUTIL.MPEXL.SYS       both boot
SADPATCH.MPEXL.SYS       SADPATCH.MPEXL.SYS       both boot
SAT.MPEXL.SYS            SAT.MPEXL.SYS            both boot
MPROC.MPEXL.SYS          MPROC.MPEXL.SYS          both boot
UNIPROC.MPEXL.SYS        UNIPROC.MPEXL.SYS        both boot
MDIAG.MPEXL.SYS          MDIAG.MPEXL.SYS          both boot
TDIAG.MPEXL.SYS          TDIAG.MPEXL.SYS          both boot
EDBC.MPEXL.SYS           EDBC.MPEXL.SYS           both boot
EDPROC.MPEXL.SYS         EDPROC.MPEXL.SYS         both boot

IPL FILE                 FILENAME                 TYPE
---------                --------                 ----
ISL2.MPEXL.SYS           ISL2.MPEXL.SYS           tape ipl
MMSAVE.MPEXL.SYS         MMSAVE.MPEXL.SYS         disc ipl
```

Example 8-5. SYSFILE Configurator SHOW ALL Output

```
SYSTEM PROGRAM              FILENAME                    TYPE
--------------              --------                    ----
IFHPIBFS.PUB.SYS            IFHPIBFS.PUB.SYS            system prog
XL.PUB.SYS                  XL.PUB.SYS                  system prog
PSIMDBDL.DIAG.SYS           PSIMDBDL.DIAG.SYS           system prog
PSINIODL.DIAG.SYS           PSINIODL.DIAG.SYS           system prog
SYSDIAG.PUB.SYS             SYSDIAG.PUB.SYS             system prog
      .                           .                           .
      .                           .                           .
DTCSWI04.PUB.SYS            DTCSWI04.PUB.SYS            system prog
DTCSWJ04.PUB.SYS            DTCSWJ04.PUB.SYS            system prog
DTCSWK04.PUB.SYS            DTCSWK04.PUB.SYS            system prog
DTCSWL04.PUB.SYS            DTCSWL04.PUB.SYS            system prog
DTCSWM04.PUB.SYS            DTCSWM04.PUB.SYS            system prog
```

Example 8-5. SYSFILE Configurator SHOW ALL Output (continued)

The add commands (AAUTO, ABOOT, ACMSL, and ASPROG) add objects to the list of files dumped onto SYSGEN's tape:

AAUTO adds an autoboot file to the list of files.

ABOOT adds a boot image to the list of files.

ACMSL adds a segment to a temporary copy of the CMSL, which SYSGEN automatically manages.

ASPROG adds a system program or other file to the list of files.

Adding autoboot files

The AAUTO command (abbreviated AA) adds an autoboot file to the list of files dumped onto SYSGEN's tape. The command has the following parameters:

```
AAUTO (AA)  [FILE     =]  autobootfilename
            [TYPE     =   DISC ]
                        [ TAPE ]
                        [ BOTH ]
```

FILE specifies the file name that contains autoboot commands. If it is not fully qualified with group and account name, it defaults to the current group and account. If the specified file does not exist, an error occurs, and the system issues a message.

Note

Always use fully qualified file names.

TYPE specifies the type of autoboot files to add. TYPE allows the following types:

DISC Specifies that the file is applicable to a disk boot only.

TAPE Specifies that the file is applicable to a tape boot only.

BOTH Specifies that the file is applicable to both disk boot and tape boot.

There can be only one disk and one tape autoboot file, although neither is required. The tape and disk autoboot files become **TAPEAUTO.MPEXL.SYS** and **AUTOBOOT.MPEXL.SYS**, respectively.

Adding boot files

The **ABOOT** command (abbreviated **AB**) adds a boot image to the system file configuration. The command has the following parameters:

```
ABOOT (AB)  [IMAGE     =] bootimagename
            [FILE      =] filename
            [TYPE      =  DISC ]
                          [ TAPE ]
                          [ BOTH ]
```

IMAGE specifies the name of a boot image. If the specified boot image already exists, an error occurs.

FILE adds the file name of the boot image. If the file name is not fully qualified, it defaults to the current group and account. If SYSGEN is run from a different group and account when the tape is made, unexpected results occur (for example, **cannot find the specified files**). If the file to be added does not exist, an error occurs.

TYPE specifies the type of boot images to add. **TYPE** allows the following types:

DISC Specifies that the file is applicable to a disk boot only.

TAPE Specifies that the file is applicable to a tape boot only.

BOTH Specifies that the file is applicable to both disk boot and tape boot.

To add file information for the boot image, enter the **ABOOT** command, file name, and at least one parameter:

```
sysfile>ABOOT START2.UTIL.SYS START2.UTIL.SYS TYPE=DISC
```

Adding a segment to the compatibility mode segmented library (CMSL)

The ACMSL command (abbreviated AC) adds a segment to the CMSL. The command has the following parameters:

```
ACMSL (AC)   [SEG  =]  segmentname
             [FILE =]  filename
             [MODE =   S ]
                       [ C ]
                       [ P ]
                       [ U ]
```

SEG specifies a new segment name with a maximum of eight characters. If an existing *segmentname* is specified, an error occurs.

FILE specifies a file name to be added to the CMSL. The *filename* parameter can be fully qualified with group and account. If not, it defaults to the current group and account. If *filename* cannot be found, an error occurs.

MODE indicates where the added SL segment is to reside. It expects one of the four options listed below. Other entries cause errors.

P	Declares a segment to be a permanently allocated user segment. This parameter performs the same function as the **ALLOCATE** command.
S	Declares a segment to be a permanently allocated system intrinsic segment (in virtual memory).
C	Declares a segment to be a core-resident system intrinsic segment.
U	Declares a segment to be a temporarily allocated user segment.

Adding file names to dump to tape

The ASPROG command (abbreviated AS) adds a system program or other file to the list of files to be saved on tape. The command has the following parameters:

```
ASPROG (AS)   [PROG   =] program-name
              [FILE   =] filename
```

PROG expects a system program name. If the specified *program-name* already exists in the system program list, an error occurs.

FILE expects a file name to be used as the system program. If it is not fully qualified with group and account name, it defaults to the current group and account. If the specified *filename* does not exist, an error occurs.

To add a program to tape, enter the program and file name:

```
sysfile>ASPROG FCOPY.PUB.SYS FCOPY.PUB.SYS
```

Deleting Objects from the SYSGEN Tape

The delete commands (DAUTO, DBOOT, DCMSL, and DSPROG) delete objects from the list of files dumped to tape with SYSGEN's global module TAPE command:

DAUTO deletes the specified autoboot type from the list of files.

DBOOT deletes boot images from the list of files.

DCMSL deletes segments from the CMSL.

DSPROG removes system programs or files from the configuration.

Deleting autoboot images

The DAUTO command (abbreviated DA) deletes the specified autoboot type from the list of files dumped onto SYSGEN's tape. The command has the following parameter:

```
DAUTO    [TYPE  =   DISC ]
                    [ TAPE ]
                    [ BOTH ]
```

TYPE specifies the type of autoboot file deleted. The following types are allowed:

DISC	Specifies that the file applies to disk only.
TAPE	Specifies that the file applies to tape only.
BOTH	Specifies that the file applies to both disk and tape.

Deleting an autoboot file, creating a SYSGEN tape, and updating your system using the newly generated tape does not remove the disk autoboot file from the system. Remove the disk file using the ISL INSTALL command.

Deleting boot images

The DBOOT command (abbreviated DB) deletes a boot image file name. If the boot image has an associated library, DBOOT also deletes the library. DBOOT has the following parameter:

DBOOT (DB) [IMAGE =] *bootimagename*

IMAGE is a repeated parameter that specifies which boot image names you want to delete. If a specified boot image name does not exist in the configuration, a warning is issued.

Use the SHOW command to display a listing of the applicable boot image file names.

To delete one or more boot image file names, enter DBOOT and the file name(s) to be removed at the SYSFILE prompt:

```
sysfile>DBOOT filename
```

Deleting compatibility mode segments from a SYSGEN tape

The DCMSL command (abbreviated DC) deletes segments from the compatibility mode segmented library (CMSL). The DCMSL command has the following parameter:

```
DCMSL (DC)    [SEG    =] segment-name, ...
```

SEG is a repeated parameter that specifies the existing segment name. If a nonexistent segment name is specified, an error occurs.

Use the LCMSL command to list the contents of the CMSL.

Removing system programs from a SYSGEN tape

The DSPROG command (abbreviated DS) removes system programs or files from the system configuration. DSPROG has the following parameter:

```
DSPROG (DS)    [PROG    =] programname, ...
```

PROG is a repeated parameter that specifies the system program name to be deleted. If a specified program name does not exist, an error occurs.

To remove a program or file name, enter the command and name:

```
sysfile>DS FCOPY.PUB.SYS
```

Deleting a system program does not remove it from the disk. To remove it from disk, an ISL INSTALL must be performed.

Replacing Objects on the SYSGEN Tape

The replace commands (RAUTO, RBOOT, RCAT, RCMSL, RDCC, RIPL, RNMLIB, and RSPROG) replace or modify information in the list of SYSGEN dump files.

RAUTO replaces an existing autoboot image or modifies the autoboot type.

RBOOT replaces an existing boot image or modifies the boot type.

RCAT replaces the message catalog.

RCMSL replaces a segment in the temporary copy of the CMSL.

RDCC replaces network configuration file dumped to the SYSGEN tape.

RIPL replaces an existing IPL image.

RNMLIB replaces a native mode (NM) library.

RSPROG replaces an existing system program or other file.

Replacing autoboot images

The RAUTO command (abbreviated RA) replaces an existing autoboot image in the list of files dumped to SYSGEN's tape. The command has the following parameters:

```
RAUTO (RA)    [FILE  =]  autobootfilename]
              [TYPE  =   DISC  ]
                       [ TAPE  ]
                       [ BOTH  ]
```

FILE specifies a file name to replace the designated autoboot image. If it is not fully qualified with group and account name, it defaults to the current group and account. If the specified file does not exist, an error occurs.

TYPE specifies the boot image type. The various types are defined as follows:

DISC	Specifies that the file is applicable to a disk boot only.
TAPE	Specifies that the file is applicable to a tape boot only.
BOTH	Specifies that the file is applicable to both disk boot and tape boot.

To modify or replace an autoboot image file name, enter the command, fully qualified file name, and type:

```
sysfile>RAUTO filename TYPE=DISC
```

Use the SHOW command to display the autoboot image file names maintained by the system.

Replacing boot images

The RBOOT command (abbreviated RB) modifies the boot type of an existing boot image file name or replaces the boot image file name with another boot image file name. The command has the following parameters:

```
RBOOT (RB)  [IMAGE  =]  boot-image-name
            [FILE   =]  filename
            [TYPE   =   DISC  ]
                        [ TAPE ]
                        [ BOTH ]
```

IMAGE specifies an existing boot image name to be modified or replaced. If the specified boot image does not exist, an error occurs.

FILE specifies a file name to replace the designated boot image. If it is not fully qualified with group and account name, it defaults to the current group and account. If the specified file does not exist, an error occurs.

TYPE specifies the boot image type. The various types are defined as follows:

DISC	Specifies that the file is applicable to a disk boot only.
TAPE	Specifies that the file is applicable to a tape boot only.
BOTH	Specifies that the file is applicable to both disk boot and tape boot.

To modify or replace a boot image file name, enter the command, image name, and fully qualified file name. Here are two examples.

```
sysfile>RBOOT imagename TYPE=DISC

sysfile>RBOOT imagename filename DISC
```

Use the SHOW command to display the boot image file names maintained by the system.

Configuring a message catalog

The RCAT command (abbreviated RC) configures the message catalog to be used on the target system. RCAT has the following parameter:

```
RCAT (RC)    [NAME    =] filename
```

The system message catalog contains all the system and subsystem messages. It is retained under a known file name (CATALOG.PUB.SYS).

NAME specifies a catalog file name. If the name is not fully qualified, it defaults to the current group and account.

To replace the default catalog name CATALOG.PUB.SYS with a new catalog name, enter RCAT and the fully qualified file name:

```
sysfile>RCAT filename.group.account
```

If the new message catalog file was not previously created, an error occurs.

Note

For information on how to modify an existing message catalog, refer to the *Message Catalogs Programmer's Guide* (32650-60012).

Replacing a CMSL segment

The RCMSL command (abbreviated RCM) replaces a segment in the CMSL. RCMSL has the following parameters:

```
RCMSL (RCM)  [SEG  =] segment-name
             [FILE =] filename
             [MODE =   S ]
                     [ C ]
                     [ P ]
                     [ U ]
```

SEG specifies a new segment name of maximum eight characters. If a nonexistent segment name is specified, an error occurs.

FILE specifies a file name to be added to the CMSL. The *filename* parameter can be fully qualified with group and account. If not, it defaults to the current group and account. If the file name cannot be found, an error occurs.

MODE indicates where the added SL segment is to reside. It expects one of the four options listed below. Other input causes an error.

- P Declares a segment to be a permanently allocated user segment. This parameter requests the same function as the ALLOCATE command.
- S Declares a segment to be a permanently allocated system intrinsic segment (in virtual memory).
- C Declares a segment to be a core-resident system intrinsic segment.
- U Defaults if MODE is not specified.

Use the LCMSL command to display the segments maintained in the CMSL.

Replacing or defining a network configuration file

The RDCC command (abbreviated RD) defines the network configuration file to be used. This command also checks for conflicts with SYSGEN's I/O configuration. The file named becomes NMCONFIG.PUB.SYS for SYSGEN's tape only. The user must install or update the system from tape before the file can be used by the network software.

RDCC has the following parameter:

RDCC (RD) [FILE =] *filename*

The FILE parameter identifies the network configuration file. If the name is not fully qualified, it defaults to the current group and account. If no file paramter is entered, the network configuration file is changed back to NMCONFIG.PUB.SYS.

To add the network configuration file information to the current SYSGEN configuration information, enter the command and file name. Then, follow this sample sequence:

```
sysfile>RDCC filename.group.account
sysfile>HOLD          (Cross-validation conflicts noted)
sysfile>EXIT
sysgen>IO            (Make I/O changes if necessary)
                      (Conflicts also noted here)
sysgen>KEEP NETWORK  (Conflicts also noted here)
sysgen>TAPE          (Conflicts also noted here)
```

For additional information, refer to Chapter 5. For additional information on remote configurations, refer to the *Asynchronous Serial Communications System Administrator's Reference Manual* (32022-61001) and the *HP 3000/iX Network Planning and Configuration Guide* (36922-61023).

Replacing an IPL image

The RIPL command (abbreviated RI) replaces an existing IPL image in the list of files dumped onto SYSGEN's tape. The command has the following parameters:

RIPL (RI) [IMAGE =] *imagename* [FILE =] *filename*

IMAGE specifies an existing IPL image to be modified or replaced. If the specified image does not exist, an error occurs and the system issues a message.

FILE specifies a file name to replace the specified IPL image. If it is not fully qualified with group and account name, it defaults to the current group and account. If the specified file does not exist, an error occurs and the system issues a message.

There can be only one disk and one tape IPL, each of which is replaced by its image name. Both IPL files must reside on the tape.

To replace an IPL image, enter the command and the image and file names:

```
sysfile>RIPL imagename filename
```

Replacing the native mode library

The RNMLIB command (abbreviated RN) replaces the system NM library that resides in NL.PUB.SYS. The RNMLIB command has the following parameters:

RNMLIB (RN) [FILE =]*filename*

FILE is the file name of the library to replace the current one. If the file name is not fully qualified, it defaults to the current group and account. If the file name does not exist, an error occurs.

To replace an existing NM library, enter the following command format:

```
sysfile>RNMLIB filename.group.account
```

Replacing a system program

The RSPROG command (abbreviated RS) replaces an existing system program. RSPROG has the following parameters:

RSPROG (RS) [PROG =]*programname* [FILE =]*filename*

PROG specifies an existing program name. If the name entered does not exist, an error occurs.

FILE specifies the file name to replace the specified system program. If the file name is not fully qualified with group and account name, it defaults to the current group and account. If the file name does not exist, an error occurs.

Enter the command, an existing program name, and the fully qualified file name to replace the system program:

```
sysfile>RSPROG programname.group.account filename.group.account
```

Use the SHOW command (SH SPROG) to display all the system programs maintained by the configuration.

Caution

Do not use the SYSFILE> RSPROG command to rename Hewlett-Packard supplied MPE/iX HP 3000 system files. A renamed system file can corrupt your system during an update. This problem can occur if you have third party software installed on your system and you have renamed some system files to use this software.

Use the SHOW command in SYSFILE to ensure that all Hewlett-Packard supplied system files have retained their original name. System filenames in both columns should be identical. If they are not identical, rename the files in the second column to the filename in the first column.

Using a Segmented Library File as CMSL

The CMSL command (abbreviated CM) specifies an SL file to be used as the compatibility mode SL. CMSL has the following parameter:

CMSL (CM) [SL =] *slname*

The *slname* parameter is an SL file name. If the SL file name is not fully qualified, it defaults to the current group and account. If an SL name is not specified, the default is SL.PUB.SYS.

Enter the command and a fully qualified SL name to change the default, SL.PUB.SYS, as shown in the following example.

```
sysfile>CMSL NEWSL.PUB.SYS
```

Listing CMSL Contents

The LCMSL command (abbreviated LC) lists the contents of the CMSL or a single segment in the CMSL. LCMSL has the following parameter:

LCMSL (LC) [SEG =] *segmentname*

The segment name designates which segment to list. If the segment name is not specified, the entire contents of the CMSL is listed.

If SYSGEN cannot locate the segment name, an error is generated, and the command is rejected by the segmenter.

To list the contents of a single segment, enter the command and the segment name:

```
sysfile>LCMSL cminin
```

To list the entire CMSL, enter the command without a parameter.

Note

The LCMSL command locks whichever SL it is listing. If the CMSL is SL.PUB.SYS, and no changes have been made (changes force a temporary SL to be created), any program that uses the SL stops. This can cause the system to appear to be down.

Clearing SYSFILE Configurator Changes

If you desire to clear all SYSFILE configuration changes made, enter the CLEAR command at the SYSFILE configurator prompt:

```
sysfile>CLEAR
```

Once a SYSGEN> KEEP is done, the changes become permanent and CLEAR does not remove them.

Holding and Saving Configuration Changes

Using the SYSFILE configurator commands described in the previous sections changes the configuration specified in the SYSGEN command line or global BASEGROUP command. These changes are temporary and are lost if not properly saved.

Saving configuration changes is a two-step procedure. After you alter a configuration, you must first, hold the changes before exiting the configurator. Second, use the global module KEEP command to save the changes.

To hold changes, enter the HOLD command (abbreviated HO) at the SYSFILE configurator prompt:

```
sysfile>HOLD
```

You can work in a SYSGEN configurator, hold the changes, and continue working in another SYSGEN configurator before saving the changes.

To save the changes, hold all desired changes, exit to SYSGEN's global module, and issue the KEEP command (abbreviated KE or K):

```
sysgen>KEEP newgroupname
```

Entering an MPE Command from the SYSFILE Configurator

Use the colon (:) to introduce an MPE command while in the SYSFILE configurator. To issue an MPE command, enter the command following the colon. For example:

```
sysfile>:SHOWTIME

THU, APR 20, 1989, 2:55PM

sysfile>
```

Exiting the SYSFILE Configurator

Use the **EXIT** command (abbreviated **EX** or **E**) to deactivate the SYSFILE configurator and to return to the SYSGEN global module.

To exit the configurator, enter **EXIT** at the SYSFILE configurator prompt:

```
sysfile>EXIT
sysgen>
```

9

Halting System Activity

A system shutdown does not imply turning off power to the computer hardware. Instead, *system shutdown* means stopping the computer's operating system. Stopping system activity makes the computer inaccessible to users. You would need to shut down the system for maintenance, for a physical move, for changing the system configuration, or for security reasons.

If done properly, a shutdown preserves all system and user files. Before the shutdown occurs, backlogged reports can be printed, or they can be saved to tape and replaced when the system is running again.

The shutdown procedure usually consists of several steps, including the following:

- telling users well in advance of a planned shutdown
- warning users 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 (This step is unnecessary unless you need the space that these reports are using.)
- answering any console requests
- shutting open communication lines
- aborting remaining jobs and sessions
- entering the `=SHUTDOWN` command

The next several sections describe procedures associated with shutting down a system. Read through the remainder of this chapter before attempting a shutdown based on these instructions. Become familiar with the commands and options used in each process. Examine the processes for areas that you may need to customize for your system.

Including Shutdown Information in the Welcome Message

Include shutdown information in the welcome message. Remember to include information about the time of the shutdown and whom a user should contact with questions. Enter:

```
:WELCOME
#(Return)
```

This erases the present WELCOME message. Enter for a second time:

```
:WELCOME
#
```

When the pound sign prompt (#) appears, enter the message line by line, terminating each line with (Return). Enter (Return) at the prompt to terminate the WELCOME message facility.

When users log on to the computer, the message notifies them of the impending shutdown. They can then plan their schedules accordingly.

Telling Users about the Shutdown

Use the TELL command to alert users to the upcoming shutdown approximately 15 minutes beforehand. Enter:

```
:TELL @S;Shutdown in 15 minutes.  Please log off.
```

This message reaches all active terminals, except those in quiet mode.

Limiting System Use

Use the LIMIT and JOBFENCE commands to prevent any new users from logging on or any scheduled jobs from starting. Enter:

```
:LIMIT 0,0
:JOBFENCE 14
```

The command LIMIT 0,0 limits the number of concurrently running jobs and sessions. The two parameters, in this case, 0,0, define the allowed number of jobs and sessions, respectively.

The command JOBFENCE 14 defines the minimum input priority that a job or session must have to execute. The parameter 14 raises the jobfence to the highest level.

Shutting the Spool Queues and Handling the Remaining Reports

To verify that the printer is available, to shut down spool queues, and to begin removing backlogged reports, complete the following steps:

1. Verify the printer is active. Enter:

   ```
   :SHOWDEV nn
   (nn is your printer's ldev number.)
   ```

2. Shut down the spool queue.

   Entering the SHUTQ command shuts down the spool queues to prevent users from sending reports to the printer. Enter:

   ```
   :SHUTQ nn
     (nn is your printer's ldev number.)
   ```

   or

   ```
   :SHUTQ devname
    (devname is the device name of the spooled device)
   ```

3. List the backlog of existing reports. Enter:

   ```
   :LISTSPF
   ```

   This lists all spool files. If the system responds NO SUCH FILE(S), you have no spool files. Since output spool files are permanent files, they will still be present when the system is restarted.

Warning Users Two Minutes Before Shutting Down the System

The TELL command, mentioned in previous sections, does not send its message to sessions in quiet mode. The WARN command, however, sends its message to all sessions, including those in quiet mode.

Warn users two minutes before shutting down the system. Enter:

```
:WARN @S;SYSTEM SHUTDOWN IN 2 MINUTES.  LOG OFF.
```

Closing Any Open Communication Lines

Close any of the system's open communication lines. Enter both of the following to deactivate the NS3000/XL product:

```
:NSCONTROL ABORT
:NETCONTROL STOP
```

Note

NSCONTROL ABORT ensures that all network management processes are shut down.

If you have any other communications products, consult their manuals for instructions on deactivating them.

Shutting Down the System

To shut down the system, enter:

CTRL A
```
=SHUTDOWN
```

The following keywords can also be entered in the SHUTDOWN command to document the shutdown:

```
SYSTEM
NETWORK
DTC
TERMINAL
TAPE
DISC
OTHER
```

You can use these options to indicate the reason that you are shutting down the system. For example, if you shut down to clear a dtc hang, use the DTC option.

CTRL A
```
=SHUTDOWN DTC
```

The console responds by listing shutdown messages similar to these:

```
Shutdown of operating system begins. (Shut 1)
Shutdown of user processes begins (Shut 2)
Shutdown of jobs & sessions begins. (Shut 3)
Spoolers notified of a shutdown. (Shut 16)
            .
            .
            .
Shutdown of system processes begins. (Shut 4)
Shutdown of system managers begins. (Shut 5)
Shutdown of operating system complete. (Shut 6)
```

A

Using the Access Port (AP)

This section describes the access port (AP) commands and provides the procedures for enabling a remote console, for configuring a system remote support modem port, and for performing the AP self-test.

Configuring the Console

Some of the terminal configuration parameters are important for proper AP operation. Both terminals connected to ports T0 (system console) and T1 (remote support modem port) should be configured with the following parameter settings:

From the DATACOMM CONFIGURATION menu:

```
Parity/DataBits  None/8
Chk Parity  NO
EnqAck  YES
CS(CB)Xmit  NO
RecvPace  Xon/Xoff
XmitPace  NONE
```

From the TERMINAL CONFIGURATION menu:

```
LocalEcho  OFF
SPOW(B)  NO
Line/Page(D)  LINE  (**necessary during control mode**)
ReturnDef  Return
```

Parameters not mentioned can be set to any value and do not affect AP operation.

Note

The AP is designed to operate with the HP 700/92 terminal. There have been no deliberate steps taken to preclude operation with other terminals (for example, the AP does not check the terminal identification and refuse to operate with anything else), but no other terminals have been tested for proper operation. Use other terminals at your own risk.

Entering Control Mode and Using the Command Interpreter

Control mode is the mode of operation needed to use the access port commands. Activate the AP control mode interface by entering (CTRL) (B) at the system console:

```
:(CTRL) (B)
CM>
```

To use the access port command interpreter, enter a two-character AP command at the control mode prompt (CM>), followed by a carriage return:

```
CM>RS

Execution of this command irrecoverably halts
all system processing and I/O activity and
restarts the computer system.
⋮
```

If the AP command parser does not recognize the two characters entered as a command, the system displays an error message similar to the following:

```
Illegal command, type HE for help.
```

Interpreting the System Status Line

When in control mode, the AP displays the system status line across the softkey labels of the system console. The system status line has this format:

```
CODE:  xxxx  REMOTE:  < 1 > < 2 > < 3 > ACCESS FAULT:  yy
```

Table A-1 describes the information presented in the status line.

Table A-1. Status Line Display

Field	Meaning
xxxx	Represents the four digit LED error code display.
1	May have one of three values: **enabled**, **pending**, or **disabled**. These correspond to the status of the remote console accessibility. The remote console can either be accessed (**enabled**), disconnected (**disabled**), or waiting for a user session to end (**pending**).
2	May be either **active** or **inactive**. **Active** indicates that a remote console is currently being used. **Inactive** indicates that a remote console is not currently being used.
3	May have one of two values: **single** or **multiple**. This designates whether the AP allows a single attempt (**single**) or multiple attempts (**multiple**) to access the remote console.
yy	Displays the number of times someone tried to access the remote console but failed to give the proper password.

The status line is updated with each change, such as when the system cycles through its self-test.

Using Access Port Commands

The AP has several commands for manipulating its activities. Table A-2 lists these commands and their functions.

Table A-2. Access Port Commands

Command	Function
CA	Configure system remote support modem port.
CO	Returns console from control mode to console mode.
DI	Disconnects line to remote console.
DR	Disables access to the system by a remote console.
DS	Disables display of system status line during console mode.
ER	Enables access by a remote console.
ES	Enables display of system status line during console mode.
HE	Displays the help screen.
RS	Stops all processing, initiates SPU self-test, and loads software from load device if enabled for autoboot.
SE	Transfers remote terminal from console/control mode to session mode.
TA	Initiates access port self-test.
TC	Transfers processor execution to operating-system-specific routine. Initiates a system soft reset.
TE	Sends messages (up to 80 characters) between local and remote consoles.

Using the AP Help Facility

Obtain online help by entering either HELP or the abbreviated command, HE.

The command issues the following display:

```
CM>HELP

Access Port Revision xxx  m.d.y

CA  Configure system remote support modem port.
CO  Enter console mode.
DI  Disconnect line to remote console terminal.
DR  Disable access by a remote console terminal (enables session
      access).
DS  Disable display of system status line during console mode.
ER  Enable access by a remote console terminal (disables session
      access).
ES  Enable display of system status line during console mode.
HE  Display this screen.
RS  Stop all processing, initiate SPU Self-Test, load software
      from load device if enabled for autoboot.
SE  Transfer remote terminal from console/control to session mode.
TA  Initiate Access Port Self-Test.
TC  Transfer processor execution to operating system specific routine.
TE  Send message between local and remote console terminals.
```

In the preceding display, *xxx* is the number of the revision of the operating firmware contained on the AP and *m.d.y* is the month, day and year the firmware revision was released. These identifications are necessary to manage ROM updates in the field if they become necessary.

Returning from Control Mode to Console Mode

The access port command, CO, returns the console from control mode to console mode. Once returned to console mode, the system console operates in its normal session mode. This command does not generate messages.

Configuring the Access Port

Issuing the AP command, **CA**, allows either the local or remote console operator to reconfigure the baud rate for the remote support modem port, the setting of the T1 RATE line, and the system identification. The AP accepts any configuration, making no judgment on the validity.

Using the **CA** command generates the following prompts:

```
CM>CA (Return)

Current remote support modem port configuration:

   Bit rate                        9600 bits/sec
   Rate Select/CCITT 111           High rate (ON)
   System identification:    Joe's Sink and Pipe Shop

   Do you wish to change the configuration? (Y/N): Y (Return)

  Enter your changes.  <CR> retains the current value.

  Current bit rate is 9600 bits/sec.  Select the new bit rate.
     (0=300, 1=1200, 2=2400, 3=4800, 4=9600):  (Return)

   Rate Select (CCITT 111) is currently HIGH (ON).  Choose the
      new setting (H=high or ON, L=low or OFF): H (Return)

Current System identification:   Joe's Sink and Pipe Shop.
   New identification (limited to 1 to 24 displayable characters
   or space for none): Yi's Jug and Bottle Shop (Return)

    New configuration (takes effect at next remote connection):

   Bit rate                        9600 bits/sec
   Rate Select/CCITT 111           High rate (ON)
   System identification:    Yi's Jug and Bottle Shop

   CM>
```

The baud rate for the remote console port can be set to 300, 1200, 2400, 4800, or 9600 bits per second. This should be equal to the speed that is supported by your modem (usually 2400).

The remote console port rate can be turned on or off. **ON** is the high voltage and **OFF** is the low voltage, within the definitions for control lines for both RS-232c and V.28.

The system identification is a displayable character ASCII string (24 characters maximum) that is stored on the AP, for the AP's exclusive use. The AP identification has absolutely nothing whatsoever to do with any other system identification stored elsewhere in the SPU. No other entity has access to it, and the AP has no access to any other system identification.

Enter up to 24 characters as the system identification. Characters 00 hex through 1F hex are control characters and are not considered displayable. Entering a space at the system identification prompt deletes the previous identification string.

The new configuration is written to nonvolatile memory (NVM) at the end of command processing. It is not used until the next incoming call is answered and the configuration has been written to NVM. If `CA` is executed by a remote user and the line is lost, the new configuration is still not in effect and the remote user can redial and pick up the process where the disconnection occurred.

For NVM failure, the configuration uses default parameters. These values are 1200 bits per second, for the bit rate; rate select (CCITT 111) high; and system identification set to the null string.

If, during the configuration of the remote support modem, the AP encounters any unexpected or inappropriate input, it may respond with a combination of the following messages.

```
Expecting "Y" or "N" (APERR 11)

Expecting "H" or "L" (APERR 12)

String was truncated to 24 characters. (APMSG 04)

Your selection is outside of the legal range.
(APERR 14)
```

Enabling Remote Console Access

The command ER enables remote access to control and console modes through the remote support modem port. The command is only valid from the system console. ER allows you to set the remote access password, the number of password tries, and single or multiple access.

Using the ER command generates the following prompts:

```
CM>ER [Return]

   Current remote console access configuration:

   Mode:                Multiple
   Password:            The quick brown fox
   Password faults:     10

   Do you wish to change the configuration? (Y/N): Y [Return]

Enter your changes.  <CR> retains the current value.

Current mode:   Multiple
Select the new setting (S=single, M=multiple):  [Return]
Current password:    The quick brown fox
New password (1 to 24 displayable characters or space
if no password is to be required):  [Return]
Current password fault limit:   10
New number of password faults (Range:  0-99 or space.
Space or 0 will permit unlimited password faults.): 5 [Return]

   New remote console access configuration:

   Mode:                Multiple
   Password:            The quick brown fox
   Password faults:     5

   Remote console access is now enabled.

CM>
```

The new access status settings do not take effect until you finally answer the change query with NO.

If, during the process of updating the access status settings, the AP encounters any unexpected or inappropriate input, it may respond with a combination of the following messages:

```
Expecting "Y" or "N" (APERR 11)

Expecting "S" or "M" (APERR 16)

String was truncated to 24 characters. (APMSG 04)

Your selection is outside of the legal range. (APERR 14)

Command may not be executed by a remote user. (APERR 13)
```

Upon NVM failure, the following default values are used: remote disabled, multiple access mode, maximum fault limit = 3, no password required.

Sending Messages to Both Consoles

The AP treats all displayable characters following the TE command as a comment. They are displayed but not executed. This allows you to enter a message of up to 80 characters at the master terminal that can be viewed by both consoles. For example, entering:

```
CM>TE System backup begins in 5 minutes.
```

displays the message:

```
System backup begins in 5 minutes.
```

at the remote console.

Disabling Remote Console Access

Entering DR disables remote access by the remote support modem port to control and console modes.

If the command is successful, the system displays the message:

```
Remote console access disabled.
```

Note

The remote enabled light on the front panel goes out once remote console access is terminated.

Disconnecting the Remote Line

Entering the DI command initiates a clean disconnect from the telephone line connected to the remote support modem port. This command is valid only from a remote console. If a local operator attempts to use this command, the system issues a message:

```
Command may not be executed by a local user. (APERR 15)
```

The system displays the message, **Remote line is disconnected**, when the line is disconnected.

Connecting the Remote Support Modem to a Session Port

This command is valid from the remote support modem port only.

Entering SE causes the remote support modem port to connect through to a session port. If DTR is on, the remote support port's modem remains connected. The remote support modem is able to initiate a session using a normal connection protocol, as if a new modem connection had just been established. To reenter control mode, the remote support port modem must drop the connection and redial.

Using this command and the port operation, a user at the Response Center is able to use control, console, and session mode without any intervention by the local operator. (The operator must enable remote capability of the system.)

The following message is generated if the local console operator tries to execute the SE command:

```
Command may not be executed by local user.  (APERR 15)
```

Enabling the SPU Hex Status Display

The ES command displays the system status line, including the front panel LED codes, on console terminals during console mode. Console terminal performance and software performance may be affected when a remote console is connected to the system.

The operating system writes the LED display every 0.5 seconds.

For a 300-bit per second modem, 60 percent of the available throughput is taken by the writing of the LED code. For a 1200-bit per second modem, 15 percent of the line capacity is used.

To minimize the effect, the entire system status line is not displayed. In console mode, the following display is shown:

```
CODE:  xxxx
```

The status line is placed over the softkey labels. To temporarily view the soft keys display, enter a Return.

After successfully executing the command, the following message is displayed:

```
System status display during console mode is enabled.
```

Disabling the SPU Hex Status Display

Entering DS disables the display of the system status line, including the system front panel hex display codes on the console during console mode. See the ES command for more details.

The system displays a message when the command is successful:

```
System status display during console mode is disabled.
```

Hard Resetting the SPU

Issuing the RS command causes the AP to reset the entire SPU, halting all processing and I/O activity with the exception of itself and a few operations that must maintain state even over resets. The AP clears all data from the standard output (SO) and data processing first-in-first-out (DP FIFO) buffers. When the first character arrives from either buffer, the AP returns the console from control mode to console mode.

Note

The AP command interpreter is active during the period between command execution and the arrival of characters (on either buffer ports) from the system, though the control mode prompt (CM>) isn't available.

Executing this command generates messages and prompts essential to resetting the system.

If the AP command interpreter encounters errors or inappropriate input during the reset (RS) process, it may display a combination of the following messages:

```
Expecting "Y" or "N" (APERR 11)

Unable to verify assertion of RESET_SYS backplane
signal (APERR 01).

RESET SYS backplane signal asserted, but unable to
verify SPU deassertion of PPON backplane
signal (APERR 02).

PPON not reasserted by SPU after RESET_SYS
deassertion (APERR 03).
```

The last three messages appear as a result of certain failures detected by the AP during the reset process. These messages are key to isolating the cause of the failure of the failed field-replaceable unit.

Once the reset is complete, the system displays the following message:

```
SPU hardware was successfully reset. (APMSG 02)
```

Transferring Control (Soft Reset)

The TC command initiates a transfer of control, or soft reset, of the system.

Should an error be encountered during a TC, the system displays following error message:

```
Unable to verify assertion of TOC_SYS backplane signal
(APERR 04).
```

Testing the AP

Entering TA executes the AP self-test. The system displays a message during self-test:

```
CM>TA (Return)

Console data arriving during self-test execution
will be lost.

Type Y to confirm your intention to execute AP Self-Test (Y/N): Y

Starting AP Self-Test.  Last subtest will be 30.

Executing test number:

00      01      02      03      04      05      06      07      08      09
10      11      12      13      14      15      16      17      18      19
20      21      22      23      24      25      26      27      28      29
30

AP Self-Test passed. (APMSG 01)
```

If the self-test fails:

```
AP Self-Test failed subtest xx (APERR 05).
```

where *xx* is the number of the test causing the failure. If the self-test hangs, the last number displayed is the failing subtest, provided that the numbers have appeared in numerical order (which is the expected sequence).

During the execution of self-test, some of the test numbers shown above may have the mnemonics NC, NT1H, or NS1H appended to them. Whether or not these appear depends upon the test hood configuration present at the time of test execution.

Note

The master terminal after the completion of the self-test is the terminal that was master when the test was initiated.

Using Control Commands

The following section describes additional commands that can be executed with the simultaneous use of the control key.

Entering control mode

Both a local and remote user can enter CTRL B to initiate a mode change from console mode to control mode.

Halting scrolling

Entering CTRL S causes the AP to stop passing characters from its port queues to the consoles. The queues continue to accept characters from the system. The XOFF is not passed to the system port being used for the transfer.

Allowing scrolling

Entering CTRL Q causes the AP to resume passing characters from its port queues to the consoles if this was previously stopped by XOFF character. The XON is not passed to the system port being used for the transfer.

Entering escape characters

The escape character CTRL V nullifies whatever character follows it, except for XON and XOFF characters. Any character following a CTRL V has no effect on AP operation.

Changing master consoles

Only one console can operate as the system console at a time. It is referred to as the master. The other, usually the remote terminal, can view data but cannot enter data until it takes control. Break is used to take control back and forth between the system console and an enabled remote console. When the remote console enters Break, it becomes the master console, and vice versa. In order to enter data at the remote terminal, you must press Break.

Interpreting AP Error and Informational Messages

The AP provides two classes of messages. A message that is followed by (APERR XX) is an error message. "XX" indicates the error number. A message that is followed by (APMSG XX) is an informational message, although it can indicate a potential error. Error and informational numbers may be duplicated; for example, there is both an APERR 01 and an APMSG 01.

Error Codes and Error Messages

MESSAGE	**Unable to verify assertion of RESET SYS backplane signal (APERR 01)**
CAUSE	This message, displayed during execution of the RS command, means that the backplane signal RESET_SYS- is not asserted when the AP attempts to reset the SPU. This error might be caused by any one or a combination of four conditions. Failure of the AP drive circuitry causes this error to be detected, and the SPU is not reset. The circuitry that permits the AP to read this line may have failed. If this is the case, the error message is displayed, but the SPU is reset in the proper manner. The CIO backplane may contain a short between the RESET_SYS- line and another low impedance line that is driving a high-logic level. Some other device connected to the RESET_SYS- line may be driving a high-logic level that the AP cannot overdrive.
MESSAGE	**RESET_SYS backplane signal asserted, but unable to verify SPU deassertion of PPON backplane signal (APERR 02)**
CAUSE	This message, generated during execution of the RS command, indicates that the PPON backplane signal is not deasserted within 2 seconds after the RESET_SYS- line is asserted. This error may be caused by three conditions. If the receiver, which senses this state of this line on the AP, has failed, the system displays the message. The SPU resets normally. The AP also resets itself as soon as the RS command has completed, if this is the cause of the failure. If the wiring between the assembly that receives RESET_SYS- and the AP is defective, neither the SPU nor AP resets. If the portion of the power system that generates PPON is defective, the SPU does not reset, and the AP probably does not reset.
MESSAGE	**PPON not reasserted by SPU after RESET_SYS deassertion (APERR 03)**
CAUSE	This message, displayed by the RS command, means that PPON has not reasserted within 2 seconds after being deasserted. Once this occurs, the AP becomes insensitive to being reset by the deassertion of PPON. This error is most likely the result of a fault in the assembly that generates the PPON signal.

MESSAGE	`Unable to verify assertion of TOC_SYS backplane signal (APERR 04)`
CAUSE	Information not currently available.
MESSAGE	`AP Self-Test failed subtest xx (APERR 05)`
CAUSE	This message is displayed when a failure occurs during the execution of AP self-test. XX gives the decimal number of the failing subtest.
MESSAGE	`AP failed subtest xx of idle Self-Test. (APERR 06)`
CAUSE	This message is displayed when the idle self-test fails. Since idle self-test executes whenever the AP microprocessor has idle time, this message may appear at any time, in any AP context, including during console mode operation.
MESSAGE	`AP failed subtest xx of prior idle Self-Test. (APERR 07)`
CAUSE	This message is displayed when a switch in modes is made after idle self-test has failed previously.
MESSAGE	`Permitted accesses to NVM exceeded. (APERR 08)`
CAUSE	This message is displayed each time that the AP accesses NVM after the counter in NVM indicates that the permitted number of accesses to the last block of NVM has been exhausted. The AP should be replaced at the next visit by HP service personnel. The NVM may survive for up to 20,000 more accesses after this message begins to occur, or it may fail almost immediately.
MESSAGE	`CRC error on NVM. (APERR 09)`
CAUSE	This message is displayed when the AP has exhausted the permitted number of accesses to all blocks of NVM. The default settings for NVM parameters are used. Notify your HP service personnel. The AP must be replaced.
MESSAGE	`Illegal command, type HE for help. (APERR 10)`
CAUSE	The first two characters entered in a command line for the AP command interpreter are not an AP command. Help displays all legal commands.
MESSAGE	`Expecting "Y" or "N" (APERR 11)`
CAUSE	The AP is expecting one of the letters Y or N, in either uppercase or lowercase, as the reply to the query displayed on the screen.
MESSAGE	`Expecting "H" or "L" (APERR 12)`
CAUSE	The AP is expecting one of the letters H or L, in either uppercase or lowercase, as the reply to the query displayed on the screen. `H` stands for high, and if chosen, causes the specified signal to be set to the high voltage level, which is nominally +9 Volts referenced to ground. `L` stands for low, and if chosen, causes the specified signal to be set to the low voltage level, which is nominally -9 volts referenced to ground.

MESSAGE	**Command may not be executed by a remote user. (APERR 13)**
CAUSE	The command entered is a valid AP command, but is intended for use from the local console port (port T0) only. No action has been taken.
MESSAGE	**Your selection is outside of the legal range. (APERR 14)**
CAUSE	Either numeric data has been entered when alphabetic input is expected (or vice versa), or the value of numeric data entered is outside of the permissible range of values.
MESSAGE	**Command may not be executed by a local user. (APERR 15)**
CAUSE	This command is a valid AP command, but is intended for use from the remote support modem port (port T1) only. No action has been taken.
MESSAGE	**Expecting "S" or "M" (APERR 16)**
CAUSE	The only permissible input at this time is the letter **S** for single or the letter **M** for multiple. They may be entered either in uppercase or lowercase.
MESSAGE	**Syntax error. (APERR 17)**
CAUSE	Any error other than those covered by error messages APERR 18 and APERR 19 when using the **DM**, **AM**, **DD**, or **AD** commands, causes this error message.
MESSAGE	**Illegal hexadecimal entry. (APERR 18)**
CAUSE	If any of the hex parameters entered with the **DM**, **AM**, **DD**, or **AD** commands are not valid hex numbers, this error message is be output.
MESSAGE	**Illegal address or address range. (APERR 19)**
CAUSE	Attempting to address outside the legal range of addresses with the **DM**, **AM**, **DD**, or **AD** commands causes this error message to be given.

Informational Messages

MESSAGE	`AP self-test passed. (APMSG 01)`
CAUSE	AP self-test was executed, and it has passed. The message is accurate in almost all cases; however, it is possible that the message will appear without the test having executed to completion. This case can be detected by observing whether the full complement of subtests has been executed in the proper order. AP self-test detects only approximately 70 percent of the faults on the AP.
MESSAGE	`SPU hardware was successfully reset. (APMSG 02)`
CAUSE	This message indicates that the AP did not enter the three possible error states. It does not mean that the AP has somehow detected that the processor has restarted or that it was cleared, for example. The AP has no way to determine the internal state of any other assembly in the SPU.
MESSAGE	`Console terminal not set to 9600 bits per second. Console port will operate at xxxx bits per second. (APMSG 03)`
CAUSE	The AP senses the setting of the console connected to local console port using ENQ/ACK. The console should be operating at 9600 bits per second. If it is operating at 4800, 2400, 1200, 600 or 300 bits per second, the AP senses this and operates the port at this baud rate. If the above message appears on the terminal screen, the AP and the terminal are both set for the same baud rate. If the terminal is accidentally set for other than 9600, the above-referenced procedure should be followed to reset the terminal and AP for 9600. If the terminal is set for 9600, the AP or the terminal is defective.
MESSAGE	`String was truncated to 24 characters. (APMSG 04)`
CAUSE	You can enter only up to 24 displayable characters in the answer to the query on the screen. All characters past the twenty-fourth were discarded. No action is necessary if the resulting truncated string is acceptable as the answer to the query. If the resulting string is not acceptable, continue command execution until you are again prompted for the string and enter the new string.
MESSAGE	`AP configuration lost. Use CA and ER commands to recover. (APMSG 05)`
CAUSE	If this message recurs after each reset, power on, or self-test execution, the AP is defective.

B

Startup, Dump, and Shutdown Listings

This appendix lists the messages, received at the console during successful ISL startup (START), load (UPDATE and INSTALL), dump (DUMP), and shutdown (SHUTDOWN) operations.

The START listing begins at the control mode prompt and illustrates the system reset, processor-dependent code (PDC), and input/output-dependent code (IODC) messages. This listing, similar to the uninterrupted autoboot sequence shown in Chapter 2, halts at the ISL prompt, waits for the user to enter the ISL START command, and continues by listing the messages received until the operating system is running.

Each of the other listings (UPDATE, INSTALL, and DUMP) begins at the ISL prompt where the UPDATE, INSTALL, or DUMP command is entered, and continues through the operation. Each listing ends at the ISL prompt from the subsequent autoboot after each operation.

START Sequence

Refer to Chapter 3 for information on the steps involved in the startup process. The following listing shows the Series 950 ISL START (autoboot on) sequence received at the console. Sequences from other installations may vary:

```
CM> TC

Processor Dependent Code (PDC) revision 2.8

Console path         = 2/4.1.0.0.0.0.0
Primary boot path    = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.

Soft Booted- -memory state is valid

Autoboot from primary path enabled.
To override, press any key within 10 seconds.
```

```
10 seconds expired--proceeding with autoboot

console IO Dependent Code (IODC) revision 3
Boot    IO Dependent Code (IODC) revision 3

Booted.
MMSAVE Version 9.90
DUMPAREA protected, proceeding to ISL without memsave
ISL loaded

ISL Revision 2738  September, 1987

    Cannot find an auto-execute file.  AUTOBOOT ABORTED.

ISL> START

MPE/XL launch facility

Initialize_genesis - Version : <<870204.1552>>

THU, MAY 26, 1988,  4:28:32 PM (y/n)?

[TMUX_DAM] 15 7 12 14
Initialize genesis completed.
Create Console Messages kso completed.
Initialize memory manager completed.
Initialize resident kernel completed.
beginning recovery
setup complete - beginning recovery of free space map and label table
completed recovery of free space map and label table
completed recovery of files

begin posting of recovered files
recovery completed
NEW and TEMP files deallocated for MPEXL_SYSTEM_VOLUME_SET:MEMBER1
    (LDEV 1)
Initialize volume management completed.
Opening the native system library completed.
Initialize process management completed.
Initialize debug subsystem completed.
Initialize file system completed.
Initialize loader completed.
Initialize non-resident services completed.
Begin binding compatibility mode SL
Compatibility mode SL binding complete
Create port process has been completed.
    Warning     - Protection of the system file 'AUTOBOOT.MPEXL.SYS',
```

```
    failed.
Protection of system files has been completed.

The following is a list of the boot options -
   last boot command:    INSTALL   last configuration group:    CONFIG
   current boot command: START     current configuration group: CONFIG
   logon = OPERATOR.SYS
   NORECOVERY                          MULTI-USER
   MULTI-DISK                          SYSSTART

Entering - System I/O configuration.
The path 2 has already been configured.
The path 2/4 has already been configured.
The path 2/4.0 has already been configured.
The path 2/4.0.0 has already been configured.
The path 2/4.0.2 was configured but is not available.
The path 2/4.1 has already been configured.
The path 2/4.1.0 has already been configured.
The path 2/4.3.0 was configured but is not available.
The path 2/4.3.4 was configured but is not available.
The path 2/4.3.5 was configured but is not available.
The path 2/8.0.0 was configured but is not available.
The path 2/8.0.1 was configured but is not available.
The path 2/8.0.2 was configured but is not available.
The path 2/8.0.3 was configured but is not available.
The path 2/8.1.0 was configured but is not available.
The path 2/8.1.1 was configured but is not available.
The path 2/8.1.2 was configured but is not available.
The path 2/8.1.3 was configured but is not available.
The path 6/4.0.0 was configured but is not available.
The path 6/4.0.1 was configured but is not available.
The path 6/4.0.2 was configured but is not available.
The path 6/4.3.4 was configured but is not available.
The path 6/4.3.5 was configured but is not available.
The path 6/4.3.7 was configured but is not available.
Leaving -  System I/O configuration.
```

```
                              SYSTEM I/O AT BOOT TIME

ldev:    1   HP7937H  configured      available  2/4.0.0
ldev:    2   HP7937H  configured      available  2/4.0.1
ldev:    3   HP7933H  configured  not-available  2/4.0.2
ldev:    6   HP2567A  configured      available  6/4.3.6
ldev:    7   HP7980A  configured      available  6/4.3.0
ldev:    8   HP7978B  configured  not-available  2/4.3.0
ldev:   10   HP7980A  configured  not-available  6/4.3.7
ldev:   19   HP2680A  configured  not-available  6/4.3.4
ldev:   20   HP2392A  configured      available  2/4.1.0
ldev:   21   HP7937H  configured  not-available  6/4.0.0
ldev:   22   HP7937H  configured  not-available  6/4.0.1
ldev:   23   HP7937H  configured  not-available  6/4.0.2
ldev:   25   HP7937H  configured  not-available  2/8.0.0
ldev:   26   HP7937H  configured  not-available  2/8.0.1
ldev:   27   HP7933H  configured  not-available  2/8.0.2
ldev:   28   HP7933H  configured  not-available  2/8.0.3
ldev:   29   HP2688A  configured  not-available  6/4.3.5
ldev:   30   HP2688A  configured  not-available  2/4.3.4
ldev:   31   HP7937H  configured  not-available  2/8.1.0
ldev:   32   HP7937H  configured  not-available  2/8.1.1
ldev:   33   HP7935H  configured  not-available  2/8.1.2
ldev:   34   HP7935H  configured  not-available  2/8.1.3
ldev:   39   HP2688A  configured  not-available  2/4.3.5

   MEMORY AVAILABLE FOR USE (bytes)   : 33554432

Entering - Initialize system member volumes
Leaving -  Initialize system member volumes
Entering - Mount all volumes

VOLUME ALREADY MOUNTED ON LDEV 1 (AVR 10)
   A volume has been mounted on ldev 1

LONER VOLUME MOUNTED ON LDEV 2 (AVR 11)
   A volume has been mounted on ldev 2

   Warning     - Volume is not available for mounting.  The ldev is 3
   Warning     - Volume is not available for mounting.  The ldev is 25
   Warning     - Volume is not available for mounting.  The ldev is 26
   Warning     - Volume is not available for mounting.  The ldev is 27
   Warning     - Volume is not available for mounting.  The ldev is 28
   Warning     - Volume is not available for mounting.  The ldev is 31
   Warning     - Volume is not available for mounting.  The ldev is 32
   Warning     - Volume is not available for mounting.  The ldev is 33
   Warning     - Volume is not available for mounting.  The ldev is 34
   Warning     - Volume is not available for mounting.  The ldev is 21
   Warning     - Volume is not available for mounting.  The ldev is 22
   Warning     - Volume is not available for mounting.  The ldev is 23
Leaving -  Mount all volumes
```

```
The current boot command has been saved on the system master.
NMLG FILE NUMBER 0 ON.
[PSI_DUMP_SURR] Version A.00.01.026
16:30/11/DCC STARTUP - ENTER - version C0005105 compiled 880322
16:30/11/DCC warning  128-1, (Startup) can not open NMCONFIG,
    status  FF09008F.
16:30/18/DCC ERROR  14-1, Configuration file open error  001000B4.
16:30/11/DCC STARTUP - ERROR
System State:  Initializing Mode.
Reply Information Table has been initialized!
System State:  Multiuser Mode.
SYSTEM LOG FILE #1 IS ON
Initializing Job & Session
Initiate Operator Log On
SESSION Scheduling Initialized
JOB Scheduling Initialized
Successfully launched diagnostic monitor process.
ACCT EXISTS, USER NAME DOESN'T.  (CIERR 1438)
16:31/24/MISSING USER NAME DURING LOGON ON LDEV #20. (js 11)
MPE XL:
```

DUMP Sequence

Refer to Chapter 3 for information on the steps involved in the DUMP process. The following represents a DUMP sequence for Series 950 through Series 955 systems received at the console. DUMP sequences for other installations may vary.

Caution

Do not use the RS command from the console or push the reset button on the front panel to reset the system for a dump. Hard resetting the system initiates a processor self-test that invalidates dump data.

```
CM> TC


Processor Dependent Code (PDC) revision 3.2

Console path        = 2/4.1.0.0.0.0.0
Primary boot path   = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.

Soft Booted- -memory state is valid

Autoboot from primary path enabled.
To override, press any key within 10 seconds.

** A key is pressed **

Boot from primary boot path (Y or N)?> Y

Interact with IPL (Y or N)?> Y

Booting.

Console IO Dependent Code (IODC) revision 4
Boot    IO Dependent Code (IODC) revision 4


Booted.
MMSAVE Version 2.2
DUMPAREA found, save main memory to disc
ISL loaded

ISL Revision A.00.28 July 15, 1993

ISL> DUMP
```

```
MPE/XL launch facility

MPE/XL Dump Version A.00.00 - initialization
 A full dump, including secondary storage, was requested.

Enter user identification string for this dump (80 chars or less):
TEST DUMP 6/9/88
Initialize_genesis - Version : <<870204.1552>>
WED, JUN  8, 1988,  2:30:04 PM (y/n)?

[TMUX_DAM] 15 7 12 14
Initialize memory manager completed.

MPE/XL Dump Facility Version A.00.00

Determine pre-compression size of secondary storage for ldev1
52 Megabytes of transient objects will be dumped for this device
Determine pre-compression size of secondary storage for ldev2
6 Megabytes of transient objects will be dumped for this device
Tape compression enabled.
density set at 6250 BPI on tape drive
tape is ready

Begin dump of Processor Internal Memory.
Processor Internal Memory dump complete.

Begin dump of main memory.
32 Megabytes of main memory will be dumped
................
Dump of memory save area complete.
................
Main memory dump complete.

Begin dump of secondary storage for ldev1
52 Megabytes of transient objects will be dumped for this device
..................................................
Secondary storage dump for ldev1 complete.

Begin dump of secondary storage for ldev2
7 Megabytes of transient objects will be dumped for this device
....
Secondary storage dump for ldev2 complete.

Dump completed - autoboot in progress.
```

```
Processor Dependent Code (PDC) revision 2.8

Console path         = 2/4.1.0.0.0.0.0
Primary boot path    = 2/4.0.0.0.0.0.0
Alternate boot path = 6/4.3.0.0.0.0.0

32 MB of memory configured and tested.

Soft Booted- -memory state is valid

Autoboot from primary path enabled.
To override, press any key within 10 seconds.

10 seconds expired- -proceeding with autoboot


Console IO Dependent Code (IODC) revision 3
Boot    IO Dependent Code (IODC) revision 3

Booted.
MMSAVE Version 9.90
DUMPAREA protected, proceeding to ISL without memsave
ISL loaded

ISL Revision 2738  September, 1987

    Cannot find an auto-execute file.  AUTOBOOT ABORTED.

ISL>
```

Shutdown Sequence

This sequence, unlike the previous four, begins at the MPE prompt. (Presumably, the system is up and running before it is shut down.) Refer to Chapter 9 for information on the steps involved in shutting down the system.

The following represents a shutdown sequence for Series 950 through Series 980 systems received at the console. Sequences from other installations may vary.

```
:TELL @S;SHUTDOWN IN 15 MINUTES.  PLEASE LOG OFF.
:LIMIT 0,0
:JOBFENCE 14
:SHOWOUT SP

NO SUCH FILE(S)

:WARN @S;SYSTEM SHUTDOWN IN 2 MINUTES.  PLEASE LOG OFF.
:SHOWJOB JOB=@S

JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME
#S669   EXEC        20  20       WED  8:22A  OPERATOR.SYS

1 JOBS (DISPLAYED)
0 INTRO
0 WAIT; INCL 0 DEFERRED
1 EXEC; INCL 1 SESSIONS
0 SUSP
JOBFENCE= 14; JLIMIT=0; SLIMIT=0

:WARN @S;SYSTEM SHUTDOWN IN 1 MINUTE.  ALL USERS WILL&
 BE LOGGED OFF AT THAT TIME.
:[CTRL] [A]
=SHUTDOWN
Shutdown of operating system begins.  (Shut 1)
Shutdown of user processes begins (Shut 2)
Shutdown of jobs and sessions begins. (Shut 3)
Spoolers notified of a shutdown. (Shut 16)
Shutdown of system processes begins. (Shut 4)
Shutdown of system managers begins (Shut 5)
Shutdown of operating system complete. (Shut 6)
```

C

Reading Stable Storage and Nonvolatile Memory

Certain types of system errors and failures may indicate problems with the stable storage or nonvolatile memory (NVM). In these cases, your HP customer engineer may request that you note the contents of certain locations in these storages. ISL provides two commands, **READSS** and **READNVM**, that read the contents of storage addresses in stable storage and nonvolatile memory (NVM).

Reading Stable Storage Contents

Stable storage contains the boot path information along with other critical file system parameters in a minimum area of 96 bytes of high-reliability memory. The storage maintains the critical parameters even if the storage card is removed from the backplane. After the initial memory controller is initialized, the processor-dependent code (PDC) accesses stable storage to determine the boot device and console selection process.

The stable storage contents are allocated as shown in the following figure.

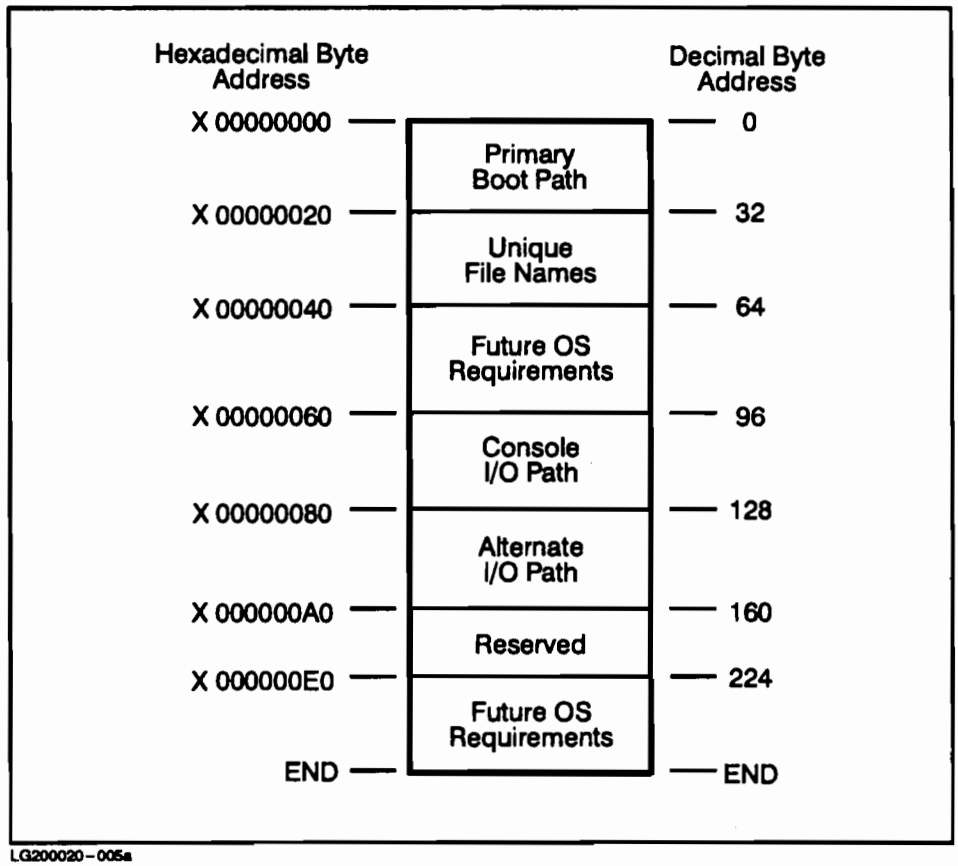


Figure C-1. Stable Storage Contents

Note

Byte addresses are numbered beginning with 0. For example, 0 is the first byte, 1 is the second.

Decimal byte address 0 contains the status of the autoboot and autosearch flags. The byte contains two hexadecimal values. The first two binary digits of the first value show the flag status as either ON (1) or OFF (0). Byte 7, obtained by reading decimal address 4, contains the logical module index.

The console path and alternate paths are stored in the same format as the primary boot path. Unlike the primary boot path, the first byte of the first word of the console and alternate boot paths is set to hex 00. The autoboot and autosearch flags are not stored with these paths.

To read one word (4 bytes) of stable storage, use the ISL command READSS:

```
ISL> READSS x (Return)
```

or

```
ISL> READSS (Return)

     Input SS address: 4

     Address 4 contains 0xFFFFFF08
```

In the last byte (number 7), 08 indicates the module number, 8.

Reading Nonvolatile Memory (NVM)

NVM stores system activity parameters, including a circular queue of the last six ISL utilities executed, which is useful as a diagnostic aid in the event of a system crash or failure.

NVM contains initialization information in a 92-byte block starting at decimal byte address 36. NVM stores this information as shown in figure C-2.

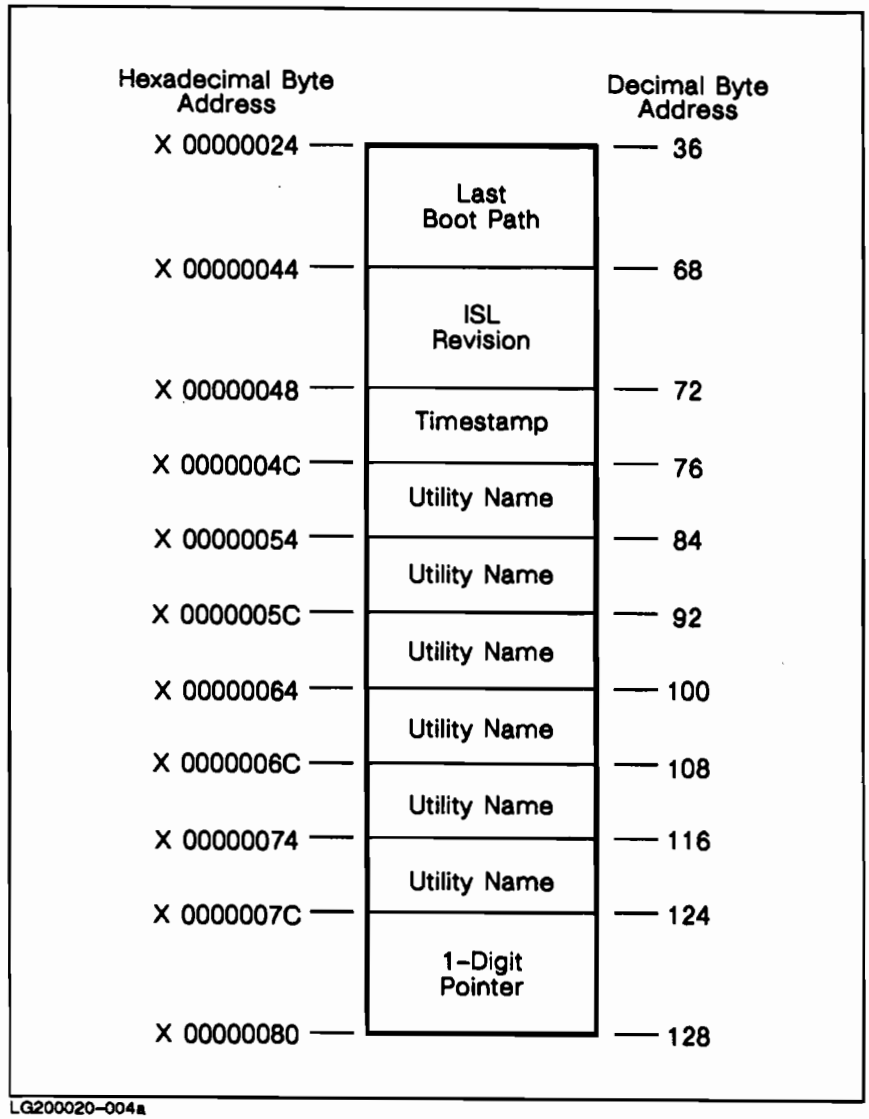


Figure C-2. NVM Contents

To read an NVM location, enter the ISL `READNVM` command and enter the hexadecimal or decimal address. The output is always in hexadecimal. In the following examples, addresses are referred to in decimal notation and the output is in hexadecimal notation.

The last boot path, starting at byte address decimal 36, contains the status of the autoboot and autosearch flags during the boot sequence.

Address decimal 68 contains the ISL revision number in ASCII.

```
ISL> READNVM 68

Address 68 contains 0x32363334   *** ISL Revision 2738 ***
```

The TIMESTAMP is in seconds since 1/1/70.

Locations 76 through 123 contain the names of the utilities booted. They are placed into a circular queue. The pointer at location 124 (first two digits) is positioned to the last utility executed. The pointer ranges from 1-6 (decimal) or 01-06 (hexadecimal), indicating which utility (1-6 - top to bottom on figure C-2) was last executed.

```
ISL> READNVM 124

    Address 124 contains 0x030600AC
    (The last six digits vary)
```

The first two digits, 03, indicate that the pointer is positioned to the third utility name location (decimal address 92) in the queue.

Read location 92 to find the hexadecimal representation of the name:

```
ISL> READNVM 92

    Address 92 contains 0x53544152
```

(53=S 54=T 41=A 52=R which spells out STAR)

Since each location is limited to four characters, additional characters are located in the next word:

```
ISL> READNVM 96

    Address 96 contains 0x54202020
```

(54=T 20=Blank which adds the last T for start)

Table C-1 lists the ISL utility names and the hexadecimal representation for both uppercase and lowercase spellings.

Table C-1. Codes for ISL Utility Names.

Utility	Uppercase	Lowercase
START	53 54 41 52 54	73 74 61 72 74
UPDATE	55 50 44 41 54 45	75 70 64 61 74 65
INSTALL	49 4E 53 54 41 4C 4C	69 6E 73 73 61 6C 6C
DUMP	44 55 4D 50	64 75 6D 70

D

Default Configurations Used by INSTALL and UPDATE

The INSTALL utility on a factory system load tape replaces a system's configuration files with a default configuration. These defaults allow the system manager or system supervisor to boot the system to a fully operational level. You should then alter the functioning configuration to meet your system's needs using SYSGEN.

START uses CONFIG as its default configuration group. Before a system can actually use the START command default to start the system, however, a functioning set of configuration files must reside in the configuration group CONFIG.

Since multiple configuration groups reside on a factory system load tape, CONFIG is empty on disk after an INSTALL until the system manager copies an appropriate configuration group into it using SYSGEN. The following is a list of appropriate configuration groups depending upon which 900 Series system you are working with.

The next sections show portions of the default input and output (I/O) configurations carried by:

Table D-1. Default Configurations for the 900 Series

GROUP NAME	SYSTEM DESCRIPTION	CARDS
CONF9X71	9X7 with 1 disk drive	SCSI
CONF9X72	9X7 with 2 disk drives	SCSI
CONF9X73	9X7 with 3 disk drives	SCSI
CONF9X74	9X7 with 4 disk drives	SCSI
CONF9X75	9X7 with 3 disk drives 2 DDS devices	SCSI
CONFG9X8	9X8LX or 9X8RX	SCSI
CONFG920	920	HP-IB
CONFG922	922 or 922LX or 922RX	HP-IB
CONFG925	925 or 925LX	HP-IB
CONFE925	925 with CIO expander bay	HP-IB
ALINK925	925 or 925LX	HP-FL
ALINE925	925 with CIO expander bay	HP-FL and HB-IB
CONFG932	932	HP-IB
ALINK932	932	HP-FL & HB-IB
CONFG935	935 with CIO expander bay	HP-IB
ALINK935	935 with CIO expander bay	HP-FL and HB-IB
CONFG948	948	HP-IB
ALINK948	948	HP-FL and HP-IB
CONFG949	949 with CIO expander bay	HP-IB
ALINK949	949 with CIO expander bay	HP-FL and HB-IB
CONFG950	950	HP-IB
ALINK950	950	HP-FL and HP-IB
CONFG955	955	HP-IB
ALINK955	955	HP-FL and HP-IB
CONFG958	958	HPIB
ALINK958	958	HP-FL and HP-IB
CONFG960	960	HP-IB
CONFSCS0	960	SCSI
ALINK960	960	HP-FL and HP-IB
CONFG980	980	HP-IB
ALINK980	980	HP-FL and HP-IB

Table D-2.
Default Configurations for the 900 Series (continued)

GROUP NAME	SYSTEM DESCRIPTION	CARDS
CONFG990	990	PB-FL and SCSI
ALINK990	990	PB-FL
CONFG991	991	PB-FL and SCSI
ALINK991	991	PB-FL
CONFG992	992	PB-FL and SCSI
ALINK992	992	PB-FL
CONFG995	995	PB-FL and SCSI
ALINK995	995	PB-FL

Note

The PB-FL card is the FL card that is used in precision bus systems, such as 99X systems.

Note

For specific information on how to start the system with the default configuration files, as well as possible additional default configuration files, refer to the *HP 3000 MPE/iX Installation, Update, and Add-On Manual* (36123-90001).

The configuration groups for the Series 935, CONFG935 and ALINK935, apply only to systems with a CIO expander. If you are working on a system without a CIO expander, you must modify the configuration group using SYSGEN so that device entries match the system configuration.

Copying Default Configuration File Groups

This section discusses renaming the default configuration files groups used by the UPDATE and INSTALL utilities mentioned in Chapter 3.

Overview

The INSTALL utility replaces a system's configuration files with a default configuration. These defaults allow the system manager or system operator to boot the system to a fully operational level. They may then alter the functioning configuration to meet their system's needs.

The UPDATE utility optionally replaces a system's configuration files with defaults. During an update, the system manager or system operator has the choice of whether or not to use a configuration stored on the system volume or to replace the current configuration with the default.

Before a system can properly use its **START** command, a functioning set of configuration files must reside in the configuration group **CONFIG**. The **START** command uses **CONFIG** as its default configuration group.

Since multiple configuration groups reside on a system load tape (SLT), **CONFIG** is empty until the system manager copies an appropriate configuration group into it.

Using SYSGEN to Copy the Files

You must use SYSGEN to copy configuration groups. Using other methods to copy configuration files removes key elements and corrupts the files.

To copy a default configuration group into the configuration group **CONFIG**, follow the instructions outlined below:

1. Activate SYSGEN.

   Entering **SYSGEN** activates SYSGEN's global module.

```
:SYSGEN

SYSGEN version B.06.01 : catalog version B.06.02 FRI, MAY 20, 1988
Copyright 1987 Hewlett-Packard Co.  All Rights Reserved

        **  First level command **

        io                log (lo)       misc (mi)        spu (sp)
        sysfile (sy)

        basegroup (ba)    keep (ke)      permyes (pe)     show (sh)
        tape (ta)

        clear (cl)(c)     exit (ex)(e)   help (he)(h)     oclose (oc)
        redo
sysgen>
```

2. Specify the base group on which to operate.

   Specify the group that more closely matches your system. Enter:

   sysgen>BASEGROUP *basegroupname*

3. Modify the configuration if necessary.

   If your system requires a configuration other than that provided by default, use the IO configurator to modify the current base group to meet your system's requirements. Refer to the chapter in this manual, that discusses the types of changes that you must

make. After making any changes, hold them (issue the **HOLD** command in each configurator used to make changes), and return to SYSGEN's global module.

4. Save the configuration to disk as **CONFIG**.

   After you have completed making changes, if any, save the configuration to the **CONFIG** group. Enter:

```
sysgen>KEEP CONFIG
```

5. Generate a system load tape (SLT) if desired.

   To create an SLT that contains the new configuration, use **CONFIG** as the base group, and save it to tape, as discussed in Chapter 3.

6. Use the new configuration and restart the system.

   If you modified the configuration and now desire to implement it on the system, shut down and restart the system.

   To shut down the system enter:

   :CTRL A

   =SHUTDOWN

7. The system responds by listing shutdown messages:

```
Shutdown of operating system begins.  (Shut 1)
Shutdown of user processes begins.  (Shut 2)
Shutdown of jobs & sessions begins.  (Shut 3)
Spoolers notified of a shutdown.  (Shut 16)
Shutdown of system processes begins.  (Shut 4)
Shutdown system manager begins.  (Shut 5)
Shutdown of operating system complete.  (Shut 6)
```

8. Reset the system using RS or TC. Restart it by specifying **NORECOVERY**.

   ```
   ISL> START NORECOVERY
   ```

9. Prepare the system for normal production.

   You may wish to check certain items to ensure that the system is ready for production. These items can include:

- jobfence parameters
- limit parameters
- LAN status

E

Verifying Attached Devices

This section discusses using the initial system loader's **IOMAP** or **ODE** utility to verify which devices are attached and configured to a 900 Series HP 3000 computer system.

Overview

SYSGEN provides utilities for listing the configured paths and associated devices of a system. It does not, however, provide a utility for listing the devices actually attached to the system. (A valid configured path does not require an associated device.) The initial system loader (ISL) provides the **ODE** utility for 9X8LX and 9X8RX systems and for other systems the **IOMAP** utility for locating the devices attached to a system.

A list of attached peripherals aids the system manager in assessing a system's needs, deciding where (on which I/O paths) to add or remove peripheral devices, resolving I/O path conflicts (as with SYSGEN and **NMMGR**), and restoring or copying a system's configuration.

Displaying Configured Devices

ODE and **IOMAP** are utilities that are located in the ISL boot directory of a 900 Series HP 3000 computer system. They can be launched only from ISL, which indicates that the system is down. You must run **ODE** on 9X8LX and 9X8RX systems. You can run **IOMAP** on all other systems.

When running with default options, **IOMAP** and **ODE** running MAPPER perform the following operations:

- displays the current configuration of the processor, including the presence of coprocessor boards, analyzer cards, memory sizes of cache and translation look-aside buffer (TLB) cards, the processor model number, and the processor-dependent code (PDC) firmware revision
- checks all possible I/O paths to determine if a component is present, and identifies every component (such as a module, bus converter, adapter, device, or unit)
- displays a table showing all configured components
- performs self-test and/or loopback tests on all components with self-test and/or loopback capabilities
- does not test any devices (terminals, data communication lines, or other serial devices) connected to external ports of the terminal multiplexer

The test modes of **IOMAP** include identify-test, loopback test, and self-test. Identify-test attempts to identify each component in every I/O path or specified path. The information received includes I/O path to the component, component name, component ID number, firmware revision (if applicable), hardware revision (if applicable), and an indication of which test modes are available for the component.

The loopback test performs component-dependent loopback tests where feasible. The result of this test is reported as pass, fail, unimplemented, or untestable.

The self-test initiates the internal self-test of each component that has a self-test routine. The result of this test is reported as pass, fail, unimplemented, or untestable.

Running IOMAP

Note

For 9X8LX and 9X8RX systems, you must run ODE instead of IOMAP. Refer to Running ODE later in this chapter.

To run IOMAP:

1. Remove all users from the system.

   If your system is not currently in use, skip to step 2.

   a. Log on at the system console as MANAGER.SYS. Enter:

      :HELLO MANAGER[/*userpass*].SYS[/*acctpass*]

   b. Tell users of the approaching shutdown.

      Notice that entering ISL makes the system inaccessible to users. Use the TELL command to alert users (except those in quiet mode) to the impending system shutdown. Ten minutes beforehand, ask users to log off. Enter:

      :TELL @S;SYSTEM SHUTDOWN IN 10 MIN. PLEASE LOG OFF.

c. Prevent new system activity. Enter:

```
:LIMIT 0,0

:JOBFENCE 14
```

The command **LIMIT 0,0** limits the number of concurrently running jobs and sessions. The two parameters **x**, **x** define the allowed number of jobs and sessions, respectively.

The command **JOBFENCE** defines the minimum input priority that a job or session must have to execute. The parameter, 14, raises the jobfence to the highest level.

d. Warn users five minutes prior to the system shutdown to end their sessions. Use the **WARN** command to alert all sessions (including those in quiet mode) to the shutdown. Enter:

```
:WARN @S; SYSTEM LOSS IN 5 MIN.  PLEASE LOG OFF.
```

e. Locate all jobs and sessions still in progress or scheduled. Enter:

```
:SHOWJOB JOB=@J

:SHOWJOB JOB=@S
```

The command **SHOWJOB** displays the status information about jobs or sessions.

f. Abort jobs and sessions still executing. Enter:

```
:ABORTJOB #Jnnn   (#Jnnn is the number for each job)

:ABORTJOB #Snnn   (#Snnn is the number for each session)
```

2. Reset the system. Enter:

```
:(CTRL) (A)

=SHUTDOWN
```

3. Once the system issues the final shutdown message:

```
Shutdown of operating system complete. (Shut 6)
```

Enter:

```
:(CTRL) (B)

CM> RS
```

Reset messages appear at the console while the system runs its self-test.

If autoboot is enabled on your system, interrupt it so that you receive the ISL prompt (**ISL>**). Refer to Chapter 3 for information on interrupting an autoboot sequence.

4. Enter the ISL IOMAP command at the ISL prompt.

   Enter:

   ```
   ISL>IOMAP
   ```

5. The system responds:

```
IOMAP Revision A.01.63 July 23, 1993

IOMAP Running:  ce81

This program has the capability to identify the configuration of
the system and its I/O paths and devices.  Many of the components of
the I/O system can be tested with selftest and loopback diagnostics.

Without changing any parameters, this program will map all existing
I/O components in the system, but will not perform any other diagnostics.

If loopback test is selected, be sure the loopback test hood is plugged
onto HPPB GPIO card, so that external loopback on the card is possible.
If sefltest or loopback test is selected for a LAN card, be sure the
T-connector is plugged onto the card.  If selftest is selected for a
device with removable media, make sure that is media in the device.

You may enter break mode by pressing control-C or control-Y.

You may press control-X to erase what you just typed in.

.
.
.

Do you wish to modify any program parameters? [y,n] (n):  N

Identify:  Loop 1:  All I/O components are being identified...
.
.
.
```

```
I/O Configuration:

                                                  Type  HW  SW  Revisions  Tests
Path          Component Name                       ID   Mod Mod  Hdwr  Firm Avail
------------ -------------------------------- ------ ---- ---- ----  ---- -----
0             Native Processor                     0H
4                 CIO Channel Adapter              8H   4H  10H    0     0
4.1                   HP-IB card                   2H    -   -     6  2733 ST LB
4.1.0                     7937H  disc drive     214H    -   -     -     -
4.1.1                     7937H  disc drive     214H    -   -     -     -
4.1.2                     7937H  disc drive     214H    -   -     -     -
4.1.3                     7937H  disc drive     214H    -   -     -     -
4.1.4                     7937H  disc drive     214H    -   -     -     -
4.2                 Console Device Adapter
4.3                   LAN card                     6H     -   -     3  2716 ST
4.4                   LAN card                     6H     -   -     2  2716 ST
4.5                 HP-IB card                     2H     -   -     6  2733 ST LB
4.5.2                 HPC1707A CD-ROM drive      250H     -   -     0     -
4.5.3                 7980 mag tape unit         180H     -   -     -     -
4.6                 HP-IB card                     2H     -   -     6  2733 ST LB
4.6.3                 7978A/B mag tape unit      178H     -   -     -     -
8             Memory Controller                    1H    2H   8H    4     0    LB
12            Memory Controller                    1H    2H   8H    4     0    LB
16            Memory Controller                    1H    2H   8H    4     0    LB
Identify Loop 1 (1H) complete.

Do you want to exit this program and return to ISL? [y,n] (n):  Y
IOMAP Exiting.
```

Example E-1. Example of IOMAP

This IOMAP is from a Series 925 system. The paths and other information may vary, depending on the system and configuration.

Exiting IOMAP

After running `IOMAP` a prompt appears at the end of the listing:

```
Do you want to exit this program and return to ISL?
```

Answer `YES` to this question to exit `IOMAP`. Answering `NO` returns you to the following prompt:

```
Do you wish to modify any program parameters?
```

Running ODE

To run ODE :

1. Remove all users from the system.

   If your system is not currently in use, skip to step 2.

   a. Log on at the system console as **MANAGER.SYS**. Enter:

      :**HELLO MANAGER**[/*userpass*]**.SYS**[/*acctpass*]

   b. Tell users of the approaching shutdown.

      Notice that entering ISL makes the system inaccessible to users. Use the **TELL** command to alert users (except those in quiet mode) to the impending system shutdown. Ten minutes beforehand, ask users to log off. Enter:

      :**TELL @S;SYSTEM SHUTDOWN IN 10 MIN. PLEASE LOG OFF.**

c. Prevent new system activity. Enter:

```
:LIMIT 0,0

:JOBFENCE 14
```

The command **LIMIT 0,0** limits the number of concurrently running jobs and sessions. The two parameters **x**, **x** define the allowed number of jobs and sessions, respectively.

The command **JOBFENCE** defines the minimum input priority that a job or session must have to execute. The parameter, 14, raises the jobfence to the highest level.

d. Warn users five minutes prior to the system shutdown to end their sessions. Use the **WARN** command to alert all sessions (including those in quiet mode) to the shutdown. Enter:

```
:WARN @S; SYSTEM LOSS IN 5 MIN.  PLEASE LOG OFF.
```

e. Locate all jobs and sessions still in progress or scheduled. Enter:

```
:SHOWJOB JOB=@J

:SHOWJOB JOB=@S
```

The command **SHOWJOB** displays the status information about jobs or sessions.

f. Abort jobs and sessions still executing. Enter:

```
:ABORTJOB #Jnnn   (#Jnnn is the number for each job)

:ABORTJOB #Snnn   (#Snnn is the number for each session)
```

2. Reset the system. Enter:

```
:CTRL A

=SHUTDOWN
```

3. Once the system issues the final shutdown message:

```
Shutdown of operating system complete.  (Shut 6)
```

Enter:

```
:CTRL B

CM> SP
```

Reset messages appear at the console while the system runs its self-test.

If autoboot is enabled on your system, interrupt it so that you receive the ISL prompt (**ISL>**). Refer to Chapter 3 for information on interrupting an autoboot sequence.

4. Type the following to run ODE:

```
ISL>ODE
```

5. Initiate the MAPPER module:

```
ISL>RUN MAPPER
```

MAPPER displays the current configuration using the same format as IOMAP (see example E-1 for an example display).

Exiting MAPPER

To exit MAPPER type:

```
CM> EXIT
```

Exiting ODE

To exit ODE type:

```
CM> EXIT
```

F

Adding Peripherals to a System

Three types of device adapters are available on HP 3000 systems:

HP-IB	Hewlett-Packard Interface Bus
HP-FL	Hewlett-Packard Fiber-optic Link
SCSI	Small Computer System Interface

Before a device can be used on your system you must define a pathway, consisting of various interface components, from the system to the device. Each pathway component, and the device itself, is defined (or configured) by specifying the IO Configurator **APATH** or **ADEV** command, the component's address, and the component's identifier.

This section also provides a procedure for configuring additional other devices.

For additional information on the commands used in these procedures, refer to Chapter 5.

Note

The examples in this section refer to an assortment of *identifiers* for devices, device adapters, channel adapters and, in the case of Series 950 through 980 systems, bus converters. The specific identifiers that you would use in configuring your system depend on your specific hardware. For more information refer to the documentation shipped with your hardware or contact your Hewlett-Packard support representative.

Series 917LX through Series 977 Systems

HP-FL and SCSI devices are supported on these systems. The first two configuration steps are the same for both devices. A third step is not required for single-unit HP-FL devices but is required for multi-unit HP-FL devices. The third step is required for SCSI devices regardless of whether or not the device is multi-unit.

HP-FL/SCSI Devices

The first two configuration levels consist of the device adapter address and the device address.

To configure a device adapter with a path of 48, for example, enter:

```
APATH 48,ID=nnnnn
```

Where nnnnn is a valid device adapter identifier such as HP28616A or HP28642A-SCSI.

HP-FL Devices

To configure the device use the ADEV command and the device address. For example, for a device address of 2, you would enter:

```
ADEV 48.2,ID=nnnnn
```

where nnnnn is a device identifier such as HP7937FL or HPC2474R.

If you are configuring an HP-FL device that is not a multi-unit device, you are done.

SCSI Devices

For a SCSI device you must use the word PSEUDO as the device identifier as follows:

```
APATH 48.2,ID=PSEUDO
```

Unit Identifier

The third-level provides the unit address for multi-unit devices. It is required for SCSI devices regardless of whether they are single or multi-unit. It is required for HP-FL devices only when they are configured as multi-unit devices.

To configure a unit address of 3, for example, on the disk drive configured above, enter:

```
ADEV 48.2.3,ID=nnnnn
```

where nnnnn is a valid device identifier.

If the device is not a multi-unit device or if a multi-unit device is being configured as a single unit, the device unit address of 0 is used to complete the address. For example, to use the device configured above as a single-unit device, enter the following:

```
ADEV 48.2.0,ID=nnnnn
```

where nnnnn is a valid device identifier.

Series 920, 922, 932, 948, 958, 925, 935, 949 CIO Systems

You can configure these systems with HP-IB, HP-FL and some SCSI interfaces.

Three or four levels of addressing are required: a channel adapter module number (or interface slot number), the device adapter address the device address and possibly a unit address.

Note

The operating system will not boot from a CIO SCSI device.

Channel Adapter

The first address level is the channel adapter module number. For example, to configure a channel adapter number of 4 you would enter:

```
APATH 4,ID=nnnnn
```

where nnnnn is a channel adapter module identifier such as HP19744A, HPA1101A or HPA1741A.

Device Adapter

To configure a device adapter (with an address of 3 for example) to the channel adapter module enter:

```
APATH PATH 4.3,ID=nnnn
```

where nnnnn is a device adapter identifier such as HP27113A, HP28616A or HP28642A.

HP-FL/HP-IB Devices

To configure a device (with an address of 1 for example) to the device adapter:

```
ADEV PATH 4.3.1,ID=nnnnn
```

where nnnnn is a device identifier such as HP7957A HP7937FL or HPC2474R.

Note

For reasons relating to backward compatibility, optical disk library (SCSI device) configuration for CIO does not utilize the following `PSEUDO` device identifier. Instead, optical disk libraries are configured with a valid device identifier similar to HP-FL and HP-IB devices. For more information refer to the installation documentation for the device.

SCSI Devices

For a SCSI interface you must use the word `PSEUDO` as the device identifier as follows:

```
PATH 4.3.1,ID=PSEUDO
```

Unit Identifier

The fourth-level provides the unit address for multi-unit devices. It is required for SCSI devices regardless of whether they are single or multi-unit. It is required for HP-FL and HP-IB devices only when they are configured as multi-unit devices.

To configure a unit address of 3, for example, on the device configured above, enter:

```
ADEV 4.3.1.3,ID=nnnnn
```

where nnnnn is a valid device identifier.

If the device is not a multi-unit device or if a multi-unit device is being configured as a single unit, the device unit address of 0 is used to complete the address. For example, to use the device configured above as a single-unit device, enter the following:

```
ADEV 4.3.1.0,ID=nnnnn
```

where nnnnn is a valid device identifier.

Note

An expander bay is available for configuring additional devices on series 925, 935, 949.

Series 920, 922, 932, 948, 958 NIO Systems

These machines support both CIO and NIO. This section deals with NIO configuration.

The first two configuration levels consist of the device adapter address and the device address. A third level is required for SCSI devices or multi-unit HP-FL devices.

Device Adapter

To configure a device adapter with a path of 48, for example, enter:

```
APATH 48,ID=nnnnn
```

Where nnnnn is a valid device adapter identifier such as HP28616A or HP28642A-SCSI.

HP-FL Devices

To configure an HP-FL device use the ADEV command and the device address. For example, for a device address of 2, you would enter:

```
ADEV 48.2,ID=nnnnn
```

where nnnnn is a device identifier such as HP7937FL or HPC2474R.

If you are configuring an HP-FL device that is not a multi-unit device, you are done.

SCSI Devices

For a SCSI interface you must use the word PSEUDO as the device identifier as follows:

```
APATH 48.2,ID=PSEUDO
```

Unit Identifier

The third level provides the unit address for multi-unit devices. It is required for SCSI devices regardless of whether they are single or multi-unit.

To configure a unit address of 3, for example, on the device configured above, enter:

```
ADEV 48.2.3,ID=nnnnn
```

where nnnnn is a valid device identifier.

If the device is not a multi-unit device or if a multi-unit device is being configured as a single unit, the device unit address of 0 is used to complete the address. For example, to use the device configured above as a single-unit device, enter the following:

```
ADEV 48.2.0,ID=nnnnn
```

where nnnnn is a valid device identifier.

Series 950 Through Series 980 Systems

These systems require a four or five-level address consisting of the bus converter number, the channel adapter module number (interface slot number), the device adapter number the device address, and possibly a unit address. HP-FL, HP-IB and some SCSI devices are supported.

Bus Converter

To configure a bus converter number of 6:

```
APATH 6,ID=nnnnn
```

where nnnnn is a bus converter identifier such as HPA1105A.

Channel Adapter

To configure a channel adapter module number of 4:

```
APATH 6/4,ID=nnnnn
```

where nnnnn is a channel adapter module identifier such as HP19744A.

Device Adapter

To configure a device adapter with an address of 3 to the channel adapter module identifier:

```
ADEV PATH 6/4.3,ID=nnnnn
```

where nnnnn is a device adapter identifier such as HP28616A.

HP-FL/HP-IB Devices

To configure a device with an address of 1 to the device adapter:

```
ADEV PATH 6/4.3.1,ID=nnnnn
```

where nnnnn is a device identifier such as HP7937FL or HP7937H.

Note

For reasons relating to backward compatibility, optical disk library (SCSI device) configuration for CIO does not utilize the following `PSEUDO` device identifier. Instead, optical disk libraries are configured with a valid device identifier similar to HP-FL and HP-IB devices. For more information refer to the installation documentation for the device.

SCSI Devices

For a SCSI device you must use the word `PSEUDO` as the identifier:

```
PATH 6/4.3.1,ID=PSEUDO
```

Unit Identifier

The fifth-level provides the unit address for multi-unit devices (such as the Magneto Optical Device or a Cascade Disk Drive). It is required for SCSI devices regardless of whether they are single or multi-unit. It is required for HP-FL devices only when they are configured as multi-unit devices.

To configure a unit address of 3, for example, on the device configured above, enter:

```
ADEV 6/4.3.1.3,ID=nnnnn
```

where nnnnn is a valid device identifier.

If the device is not a multi-unit device or if a multi-unit device is being configured as a single unit, the device unit address of 0 is used to complete the address. For example, to use the device configured above as a single-unit device, enter the following:

```
ADEV 6/4.3.1.0,ID=nnnnn
```

where nnnnn is a valid device identifier.

HP-FL Peripherals

The HP-FL card provides the computer system with a high-speed serial connection to peripherals over a fiber optic data link. Device specific data is converted to a format compatible with the CIO bus.

The high-speed data transfers of HP-FL cards requires that HP-FL devices occupy the lowest-priority CIB slots on CIO machines. Therefore, HP-IB systems (which can only be CIO because HP-IB is not supported on NIO) may require reconfiguration to accommodate HP-FL cards. The reconfiguration requires the primary, secondary, and alternate boot paths to change also. Systems that are initially configured to accommodate HP-FL cards may not require significant modification to accept additional HP-FL cards.

The instructions for configuring HP-IB devices may provide assistance when used for HP-FL devices, but you must modify the instructions and examples to fit your particular HP-FL installation. Appendix D lists the default configurations provided for use with HP-FL systems.

Contact your HP representative before attempting to use HP-FL cards in your system.

Adding a Peripheral to Any System

Adding a disk drive, tape drive, or printer to a system's configuration includes the following steps:

- enter SYSGEN
- view the system's current configuration
- activate the IO configurator
- make the necessary I/O configuration changes
- hold the changes
- save the changes
- verify the accuracy of the new configuration

1. Activate SYSGEN's global module.

   Enter the **SYSGEN** command at the system prompt.

```
:SYSGEN

SYSGEN  version B.06.01 :  catalog version B.06.02      FRI,  May 20,
1988


 ** First level command **

 io                log (lo)       misc (mi)        spu (sp)
 sysfile (sy)

 basegroup (ba)    keep (ke)      permyes (pe)     show (sh)
 tape (ta)

 clear (lc)(c)     exit (ex)(e)   help (he)(h)     oclose (oc)
 redo

sysgen>
```

2. Select the base group to modify.

   If you desire to modify the default configuration groups, copy the groups to other group names and modify the copies using the IO configurator. Copying the groups preserves uncorrupted versions of the default or current configurations.

   To copy configuration groups, use the **BASEGROUP** command to activate the desired configuration group. Use the **KEEP** command to save the group of files to another group name. Refer to Chapter 4 for more information on using the **BASEGROUP** and **KEEP** commands.

After deciding which copied configuration group to modify, use the global module **BASEGROUP** command to activate the group:

```
sysgen>BASEGROUP groupname
```

Use the I/O configuration contained in **CONFG935** as an example configuration for this exercise.

3. Activate the IO configurator.

   Enter the global module command, **IO**, at the SYSGEN prompt to activate the IO configurator:

```
sysgen>IO

** IO configurator commands **

 aclass (ac)      adev (ad)       apath (ap)      avol (av)
 dclass (dc)      ddev (dd)       dpath (dp)      dvol (dv)
 lclass (lc)      ldev (ld)       lpath (lp)      lvol (lv)
 maddress(ma)     mclass (mc)     mdev (md)       mpath (mp)
 mvol (mv)

 clear (cl)(c)    exit (ex)(e)    help (he)(h)    hold (ho)
 oclose (oc)      redo
 io>
```

4. Obtain I/O configuration listings.

   Enter **LCLASS**, **LDEV**, and **LPATH**, at the IO configurator prompt to get current I/O configuration listings:

```
io>LCLASS DEST=OFFLINE

io>LDEV DEST=OFFLINE

io>LPATH DEST=OFFLINE

io>OCLOSE
```

   The **OCLOSE** command closes SYSGEN's listing file, **SYSGLIST**, and prints the information in the file.

   Refer to Chapter 5 for more information on using the **LCLASS**, **LDEV**, **LPATH**, and **OCLOSE** commands.

5. Decide on which LDEV to add the drive.

   View the **LDEV** command output. Choose any unused LDEV and consider assigning it to the disk drive. For this example, use LDEV 4.

6. Decide on the class of the added peripheral.

   View the LCLASS listing. If it contains a class (DISC) assigned to a particular type of peripheral (in this case, a disk drive), use that class for your addition. Remember, each device can simultaneously belong to up to eight classes.

   If your configuration does not contain a class name for the additional peripheral, the system will create a class name for you if you use a name that does not exist. Class names may not exceed eight characters and must begin with an alphabetic character.

7. Add the path.

   Since you are adding the drive to a newly installed HP-IB card, you must define the path down to the device adapter level. Use the APATH command to define the path.

   For example, add the drive to a newly installed HP-IB card (ID number, HP27113A). The HP Service Representative who installed the card placed it in the CIO expander (CA 36) on channel adapter 2, and device adapter slot 2. Enter:

   ```
   io>APATH 36.2 HP27113A
   ```

   Refer to Chapter 5 for additional information on using the APATH command.

8. Add the device.

   Use the ADEV command to add the device, including the device address, to the path specified with the APATH command. Enter:

   ```
   io>ADEV LDEV=4 PATH=36.2.0 ID=HP7937H CLASS=DISC
   ```

   Refer to Chapter 5 for additional information on using the ADEV command.

9. Hold all changes.

   Enter the IO configurator HOLD command at the IO configurator prompt:

   ```
   io>HOLD
   ```

   Refer to Chapter 5 for additional information on using the HOLD command.

10. Exit the IO configurator.

    Enter the **EXIT** command at the IO configurator prompt:

    ```
    io>EXIT

    sysgen>
    ```

11. Save changes in a permanent file.

    Enter the global module **KEEP** command at the SYSGEN prompt:

    ```
    sysgen>KEEP CONFIG
    ```

    CONFIG is the group name under which you save the modified files. Each time you start up the system, the group **CONFIG** will then be the default.

    Refer to Chapter 4 for additional information on using the **KEEP** command.

12. Generate a boot tape.

    Mount a write-enabled tape on the tape drive. Enter:

    ```
    sysgen>TAPE
    ```

    The system may place a tape request similar to the following:

    ```
    ?11:10/#S1/46/LDEV# FOR "SYSGTAPE" ON TAPE (NUM)?
    ```

    If this message appears, respond:

    CTRL A

    ```
    =REPLY pin,7
    ```

    where *pin* is the PIN (in this instance 46) from the third location in the tape request.

    After all the files are stored, unload the tape, and write protect it. Label the tape, and store it, in a secure location, with any other backup materials.

13. Exit SYSGEN and reboot the system.

    ```
    sysgen>EXIT
    ```

Note

Any disk device smaller than 400 Mbytes should not be installed as the system disk (LDEV 1). A disk this size or smaller is too small to run the operating system and its subsystems. A 400-Mbyte or smaller disk, however, can be used as any other LDEV.

In this procedure, the system manager chains (configures) a tape drive to another configured device, (commonly referred to as a host device). The host device doesn't have to be physically attached to the system to configure the tape drive but when the tape drive is connected, the host device must be present.

G

UPS and UPS Monitor/iX Software

A new method of power failure protection is available on the HP 3000 Series 991 and 995 computer systems and the Series 9X8 systems. Instead of battery backup units, they will have one or more HP model A2998A PowerTrust UPS (Uninterruptible Power Supply) devices.

Like the battery backup method of power failure, the UPS devices protect the HP 3000 system against the loss of work in progress in cases of utility AC power failures of up to fifteen minutes in duration. Furthermore, they have been designed to appear similar to the battery backup method which minimizes their effect on system operation and management procedures.

UPS devices offer two principal advantages over the battery backup method:

- In a minimal UPS-based system, the degree of power failure protection is equivalent to that provided by the battery backup unit. You can, however, add more UPS devices to the system and provide reserve power to selected peripherals. Depending upon how much of the system is provided with UPS power, it can run a partial or full workload non-stop through limited periods of AC power failure.
- The UPS contains a serial I/O communications interface that, in conjunction with UPS Monitor/iX software, notifies the system operator of any problems. Like the battery backup hardware that the UPS devices replace, a system-wide power failure recovery message is broadcast to all active user terminals and to the console upon the return of power following a failure. In addition to console messages, the UPS Monitor/iX software also posts a variety of status and warning messages to the system log files which you can review and analyze to evaluate system performance.

Configuring a UPS device

You can use one of two configuration methods to add UPS devices to a Series 9X8 systems. For the first or only UPS, which is attached to the third serial port on the system's LAN/Console I/O interface card, you use NMMGR to set the data preconfigured in the default configuration group supplied with the FOS tape. You perform this procedure once, immediately after you install a new system. For additional UPS devices, which are attached to a DTC serial I/O port, you use NMMGR to supply all of the information necessary to configure the device(s). (As the final step in this second method, you will cross-validate the configuration files with SYSGEN.)

On a Series 991 or 995, all UPS devices are attached to the system via a DTC serial I/O port. As a result, you use NMMGR to configure them in a procedure similar to configuring terminals, and then cross-validate the configuration files with SYSGEN. Use this procedure any time you need to configure UPS devices.

Note

Each UPS device, and only a UPS device, *must* have its device class name set to `HPUPSDEV` during I/O configuration. Otherwise, the UPS Monitor/iX software will not be able to initialize and communicate with the UPS device(s) correctly.

To configure the first UPS on a Series 9X8

After you have installed a new Series 9X8 system, you must "set" the UPS configuration data supplied in default configuration group. To configure the first UPS, do the following:

1. Boot the system using the default configuration group.
2. At the MPE prompt, start the NMMGR program. Enter:

   ```
   :RUN NMMGR.PUB.SYS
   ```

3. Press the **Open Config** softkey twice and wait while NMMGR opens a configuration file.
4. Enter a node name and press the **Save Data** softkey.
5. Press the **Go to DTS** softkey to display the DTS configuration screen.
6. Tab to the third field and enter the physical path of the LAN/Console I/O interface card, then press the **Save Data** softkey.
7. Press the **Go to UPS Port** softkey and at the UPS Port screen, verify that the LDEV number is correct, the Parity Checking option is set to **none**, and the baud rate to **1200**. Make any changes to this screen if it is necessary to correct the values.
8. Press the **Save Data** softkey to save your UPS Port configuration. (Note that the upper right corner of the screen will change from `Data: N` to `Data: Y`.)

9. Press **Prior Screen** twice and at the Main screen, press **Utility**.

10. At the Utility screen, press **Validate Link/DTS** to cross-validate the DTC configuration with the SYSGEN configuration.
11. Once validation is complete, press **Prior Screen** three times and at the Open Configuration File screen, press **Exit Program** to exit NMMGR.
12. Reboot the system to make the new configuration effective.
13. Turn power to the DTC hardware off and then on again to download the correct baud rate for the UPS port to the DTC hardware. (On some systems, cycling the power to a DTC may require you to unplug it and plug it in again.)

Note

If you don't know the path of the Console/LAN interface card, start SYSGEN's I/O configurator and at the `io>` prompt, use the `LDEV` command to check the path:

```
io>LDEV LDEV=20
```

The console will be on an I/O path of the form XX/XX.0, such as 56/56.0. The UPS device that you are configuring will have a path of the form XX/XX.3 (for example, 56.3). Exit the I/O configurator and Sysgen and use this information in step 6.

To configure a UPS connected via a DTC port

Use the following steps when you are configuring additional UPS devices (i.e., those other than the first one) on the Series 9X8 system and for configuring all UPS devices on the Series 991 and 995 systems.

1. At the MPE prompt, start the NMMGR program. Enter:

   ```
   :RUN NMMGR.PUB.SYS
   ```

2. Press the **Open Config** softkey twice and wait while NMMGR opens a configuration file.
3. Press **Go to DTS** to enter the DTS configurator.
4. Press **Go to DTC** and choose the appropriate DTC configurator for the system (DTC16ix, DTC16MX, DTC16, DTC48, etc.).
5. Choose an available LDEV number for the UPS you are configuring, and determine which DTC port (DTC card number and port number) the UPS is connected to.
6. Press the **Config Card** softkey to enter the DTC card configurator.

7. Add each UPS by entering its logical device number in the Ldev field and **UP10D12** in the Profile Name field. When you have added all UPS devices, press **Save Data**
8. Press the **Validate Link/DTS** softkey to cross-validate the DTC configuration with the SYSGEN configuration.
9. Once validation is complete, press **Prior Screen** until you see the Open Configuration File screen, and then press **Exit Program** to exit NMMGR.

   If you see a message that the NETXPORT subsystem has not been validated, ignore it and exit the program.
10. Shut down the system.
11. Turn power to the DTC hardware off and then on again to download the correct baud rate for the UPS port to the DTC hardware. (On some systems, cycling the power to a DTC may require you to unplug it and plug it in again.)
12. Reboot the system to make the new configuration effective.

To use UPS Monitor/iX software

Once you have configured UPS devices on the system, they will automatically be monitored by the UPS Monitor/iX software. This software causes the UPS devices to emulate the traditional battery backup method of system powerfail handling and recovery.

The UPS Monitor/iX process behaves in one of two ways, depending on the system on which Release 5.0 of MPE/iX has been installed:

- When installed on a system that has been configured with UPS devices, UPS Monitor/iX runs continually while the system is up to monitor all of the UPS devices for power failure and any other hardware status conditions. It reports these conditions to the system operator's console via console messages and records them in the system log file.
- When installed on an old system that does not use UPS devices, UPS Monitor/iX is launched at startup, discovers that there are no UPS devices on the system, and terminates itself. In this case, the system uses the existing battery backup method of system power failure protection.

Note

UPS monitoring is event number 148 in the system log files. The default is ON (i.e. UPS hardware conditions are recorded in the files) regardless of whether the system has UPS power fail protection or not. In the latter case, when no UPS devices have been configured, the system log files will receive and record two UPS-related messages each time the system starts: one indicating that the UPS Monitor/iX process has been launched and a second message which says that no UPS devices are found in the I/O configuration.

System behavior when AC power fails

Whenever input AC power to any UPS device fails, the UPS hardware switches to internal battery operation to continue to deliver output AC power to the computer equipment. No actual power failure occurs at the computer equipment itself and, as a result, the SPU continues to operate. However, the actual behavior of the system will vary depending on how much of the system equipment is provided with UPS power.

In the "minimal" case, where only the SPU and any Remote Busses receive UPS power (and assuming that disks are external to the SPU), the system is most likely to appear to be dormant (like a traditional battery backup method system) because the system can not make progress once the disks lose power and spin down. The system will simply enter its "idle loop", waiting for disk I/O operations to complete, and that won't happen until AC power returns and the disks spin up again.

But in expanded UPS coverage systems, where some or all of the disks receive UPS power, the system may continue to run to some extent. Again, it depends on what resources the system needs to perform its workload. Batch jobs that only need CPU, memory, and disk I/O can continue to run undisturbed. Processing that requires tape or printer or terminal I/O will be blocked if those peripherals do not have UPS power.

UPS Monitor/iX issues a warning message to the system console to notify the operator that the particular UPS (identified by its LDEV number) has reported to the system that its input AC power has failed. In the following example, UPS Monitor/iX reports and power failure and a recovery shortly thereafter:

```
:showtime
FRI, AUG 13, 1993, 11:27 AM
:
:11:27/50/UPS LDEV 102 reports loss of AC input power. (UPSERR 0033)

**RECOVERY FROM POWER FAIL**

11:27/50/UPS LDEV 102 reports AC input power restored. (UPSWRN 0036)

:
```

Example ?. Sample Console Messages from UPS Monitor/iX

UPS Monitor/iX also writes a system log file entry that denotes the input power loss to the UPS device. Read "To enable logging of UPS activity" and "To review UPS activity recorded in the system log file", later in this chapter for more information.

System Behavior When AC Power Returns

The behavior of the system when AC input power returns to the UPS is very similar to that of the battery backup method systems. One of two things will happen: a recovery from power failure (if AC power returns before the UPS battery that backs up the SPU becomes exhausted) or a system crash.

If AC power returns before the UPS battery becomes exhausted (up to fifteen minutes when starting with fully charged UPS batteries; less if the batteries were already partially discharged), then the system recovers from the AC power failure and resumes normal operation. In this case, UPS Monitor/iX displays a message on the system console, posts an entry in the system log files, and broadcasts the following message to all active user terminals:

```
** RECOVERY FROM POWERFAIL **
```

If the UPS battery that powers the SPU becomes exhausted before AC input power returns, then the system really does lose AC power and crashes. In this case, when AC power does return and the UPS turns on again, the system reboots just as if it used battery backup.

To enable logging of UPS activity

The UPS Monitor/iX program posts UPS status and alarm messages to the system log files. If system logging for the UPS Monitor/iX (which is event number 148) is turned on, you can review the messages to troubleshoot your system configuration and evaluate system performance.

As the default, event 148 is ON. To verify that it is or, if necessary, to turn it on, do the following:

1. At the MPE prompt, start SYSGEN by entering:

   ```
   :SYSGEN
   ```

2. At the `sysgen>` prompt, start the LOG configurator by entering:

   ```
   sysgen>LOG
   ```

3. To display which system logging events are enabled or disabled, enter:

   ```
   log>SHOW SLOG
   ```

   You will see a list of information similar to the example shown on the next page.

4. To turn UPS Monitor/iX logging on (if it is currently listed as OFF), enter:

   ```
   log>SLOG ON=148
   ```

5. To exit the LOG configurator and SYSGEN, enter the `EXIT` command twice. You will see the MPE prompt displayed on your screen.

```
log>SHOW SLOG

        system log events              event #       status
        -----------------              -------       ------
        System logging enabled           100          OFF
        System up record                 101          ON
        Job initiation record            102          OFF
        Job termination record           103          OFF
        Process termination record       104          OFF
        NM file close record             105          OFF
        System shutdown record           106          ON
        Power failure record             107          ON
        Spooling log record              108          OFF
        I/O error record                 111          ON
        Physical mount/dismount          112          OFF
        Logical mount/dismount           113          OFF
        Tape labels record               114          OFF
        Console log record               115          ON
        Program file event               116          ON
        NCS spooling log record          120          ON
        Architected interface record     130          ON
        Password changes                 134          ON
        System logging configuration     135          ON
        Restore logging                  136          ON
        Printer access failure           137          ON
        ACD changes                      138          ON
        Stream initiation                139          ON
        User logging                     140          ON
        Process creation                 141          ON
        Chgroup record                   143          ON
        File open record                 144          ON
        Maintenance request log          146          OFF
        UPS Monitor Event Logging        148          OFF
        Diagnostic Information           150          ON
        High Priority Machine Check      151          ON
        Low Priority Machine Check       152          ON
        Directory Open/Close Logging     155          OFF
        CM File Close                    160          OFF
        Chdir                            161          OFF
        Process Adoption                 162          OFF
        File Owner Change                163          OFF
log>
```

Example ?. Sample System Log Configuration

To review UPS activity recorded in the system log file

UPS Monitor/iX status and alarm messages are recorded in the system log files as event number 148. You can use the LOGTOOL utility to review entries in the system log file about the performance and condition of UPS devices on your system. To do so, follow these steps:

1. List the names of the log files currently on your system. At the MPE prompt, enter:

   ```
   :LISTFILE LOG@.PUB.SYS
   ```

   Note the number of the last log file in the list (other than LOGDCC). You will use it in step 5.

2. Start the system diagnostic utility. At the MPE prompt, enter:

   ```
   :SYSDIAG
   ```

3. Run the LOGTOOL utility. Enter:

   ```
   DUI >RUN LOGTOOL
   ```

4. To review the current logfile, use the SWITCHLOG command to close it and open a new one.

   ```
   DUI >SWITCHLOG
   ```

5. List the UPS-related messages (which are recorded as system log event number 148) in the log file that you want to review. For example, if the last log file displayed with the LISTFILE command was LOG00017, enter:

   ```
   DUI >LIST LOG=17;TYPE=148
   ```

   Or, if the last log file was LOG00017 and you then issued the SWITCHLOG command, to see the most recent log file you would enter:

   ```
   DUI >LIST LOG=18;TYPE=148
   ```

   In a moment, you will see the contents of the system log files for event 148, which stores UPS-related messages. If event 148 was disabled, you are informed that no messages are found.

Glossary

abort
A procedure that terminates a program or session if an irrecoverable error, mistake, or malfunction occurs.

access
The process of obtaining data from files or acquiring the use of a device. Access implies an input/output (I/O) operation, and is used as a synonym for I/O.

access port (AP)
The port located in the channel I/O (CIO) section of the system card cage that provides a user support interface for issuing hard and soft resets through software commands from the console. It allows a remote console to be enabled and to switch between console and session modes.

account
A collection of users and groups. Each account has a unique name on the system. It is the method used to organize a system's users and files and to allocate use of system resources such as central processor time, online connect time, and file space. Accounts are the principal billing entity for the use of these resources. Every user must specify an account to access the system.

account level security
The types of file access assigned by the system manager to the account when it is created. The types of access are READ, LOCK, APPEND, WRITE, and EXECUTE, abbreviated R, L, A, W, and X respectively. They may be assigned to any user (ANY), members of the account only (AC), or members of the group only (GU). The types of file access permitted are the first level of system security. The account manager may further restrict groups and users within an account by assigning them a limited set of file access modes.

account librarian capability (AL capability)
A capability assigned by the account manager to a user within the account. An account librarian is allowed special file access modes to maintain specified files within the account.

account manager capability (AM capability)
A capability assigned by the system manager to one user within each account who is then responsible for establishing users and groups.

account member
A person who has been granted access to the system through the use of a valid user name within an account. Account members are created by the account manager, who defines the user name and assigns the appropriate capabilities and security restrictions for the user.

account structure
The method of providing organization, security, and billing for the system. It is used to allocate use of system resources such as central processor time, online connect time, and file space. The account is the principal billing entity for the use of system resources.

alpha character
A character in the range of A through Z (or a through z).

alphanumeric character
A character in the range of A through Z, a through z, or 0 through 9.

alternate boot path
The path used for booting the system from a boot tape.

application
A set of computer instructions or programs that guide the computer through a specific task or set of tasks. Examples of applications include spreadsheets, word processing programs, graphics, database management, and communications.

application program
A set of computer instructions that guides the computer through a specific set of tasks. Applications include spreadsheets, word processing, graphics, database management, and data communication programs.

architecture
1) The unique set of machine instructions, registers, and other components that provide the conceptual basis of a computer. 2) In networking, a structured modular network design in which different data communications tasks are assigned to different layers or levels.

attribute
File access codes and special capabilities that enable the computer to determine what functions it will or will not allow a user, group, or account to perform.

autoboot
The process of automatically starting the system.

automatic restart
Main memory battery backup to automatically restart the system after a power failure. Temporary power line interruptions can be tolerated with no data loss and without needing to restart the system.

backup
The process that duplicates computer data to offline media, such as magnetic tape. Backups protect data if a system problem should occur.

batch access capability (BA Capability)
A default capability assigned to accounts and users that allows users to submit batch jobs.

battery backup unit
A box within the SPU that contains a battery to supply power to main memory during a power failure.

boot
The process of loading, initializing, and running an operating system.

boot path
The pointers to the set of files that are used to bring up the system from disk or tape. The primary boot path is used for booting the system from disk resident software. The alternate boot path is used for booting the system from a boot tape. The console boot path is used to determine if the system can autoboot without operator intervention.

boot tape
A tape created by backing up the system configuration with the system generator (SYSGEN) utility program that is used to reload the system configuration. Also referred to as a system load tape. Equivalent to MPE V/E coldload tape.

capability
A method for determining what commands account members are allowed to execute. Capabilities are assigned to accounts, groups, and users to provide system security and access to the operating system. Account capabilities are assigned by the system manager when the account is created. The account manager then assigns capabilities to groups and users within the account.

channel
A path within a data communications line through which data flows.

channel I/O (CIO)
Input/output instructions for a channel.

channel I/O adapter
A device that provides the interface between the central bus (CTB) and the channel I/O buses. Each channel I/O adapter serves as a high performance channel multiplexer providing a full direct memory access (DMA) for all HP-IB and LAN I/O channels and synchronizing the differing speeds and bandwidths of the CTB and channel I/O buses.

channel I/O bus (CIB)
A device that provides a synchronous bi-directional data path between the central bus (CTB) and I/O devices.

channel number
The number assigned to the device controller board in the I/O card cage. It is used to calculate the logical address of the device, or device reference table (DRT) number.

CIO adapter (CA)
The interface slot number containing the adapter for the CIO Bus and central bus (CTB).

CIO expander
The channel input and output expander that provides eight additional peripheral card slots to the SPU.

class
A user-defined collection of objects.

class name
1) A label that is either unique to, or associated with, one or more devices in the system's I/O configuration, used to reference a particular device or class of devices. Device class names may be up to eight alphanumeric characters long, beginning with a letter. A single logical device can have multiple device classnames. The HP 2680 laser printer, for example, is referred to as `EPOC` (electrophotographic output for computers),`PP` (page printer), or `SLP` (system line printer). Directing output to any of these class names sends the output to a laser printer. 2) An abstract entity that can own objects in an HP SQL DBEnvironment. 3) A set of one or more SQL or ISQL commands in a file that can be executed with the ISQL `START` command.

command interpreter (CI)
A program that reads command lines entered at the standard input device, interprets them, determines if they are valid, and if so, executes them.

communication link
The software and hardware that moves data from the driver and card of one computer to the driver of an adjacent computer.

compatibility
The ability of software developed for one computer to work on another computer. See compatibility mode.

compatibility mode (CM)
A method of providing object code compatibility between MPE V/E-based systems and the 900 Series HP 3000 system. Compatibility mode allows current Hewlett-Packard customers to move applications and data to the 900 Series HP 3000 system without changes or recompilation.

configuration
1) The way in which computer and peripheral devices are programmed to interact with each other. 2) The layout of the computer system, including MPE table, memory, and buffer sizes. The configuration tells which peripheral devices are connected to the computer and how they can be accessed.

connect time
The amount of time, in minutes, that a user, group, or account has used the CPU for a session or job. It can be displayed by executing the MPE `REPORT` command.

console
A terminal given unique status by the operating system. The operator uses the console to monitor and manage jobs, sessions and resources, respond to requests, and communicate with other user terminals. It is used to boot the system and receive system loader error messages, system error messages, and system status messages.

console boot path
The path used to determine if the system can autoboot without operator intervention.

console command
A command that is executable only from the system console at the = prompt (generated by pressing CTRL and the A key at the console keyboard). Console commands cannot be entered by other users because CTRL A has no meaning on a standard terminal. The logical console, however, can be moved to a standard terminal.

console logging
A system logging event. It records console commands in the system log file.

continuation character
An ampersand (&) character entered as the last character of a command line. A continuation character tells the command interpreter that the command is longer than one line and is continuing onto a second or more subsequent lines.

control-Y
A break function activated by simultaneously pressing the CTRL key and the Y key on a terminal's keyboard. It is typically a subsystem break and does not affect MPE commands. In documentation this two-key sequence is shown as CTRL Y.

CPU time
The amount of time, in seconds, that a user, group, or account has used the CPU. It can be displayed by executing the MPE `REPORT` command.

crash
1) The unexpected shutdown of a program or system. If the operating system crashes, it is called a system crash, and requires the system to be rebooted. 2) A head crash or disk crash. This occurs when the read/write heads on a disk drive (that normally ride on a thin cushion of air above the disk) make physical contact with the disk surface, destroying data and the disk track. The extent of damage to the system depends on which disk was involved and how much of the disk was corrupted. A crash of the system disk is serious, since it contains the directory of user files as well as operating system programs, the I/O configuration, and the account structure.

create volumes capability (CV Capability)
The ability to define and access non system domain disks with the **NEWSET** command (private volumes with the **NEWVSET** command for MPE V/E). Users and accounts assigned CV capability are automatically given use volumes (UV) capability.

cumulative backup
A backup strategy where a full backup is done once a week and partial backups on all other work days.

data communications
The transmission of information from one computer or terminal to another. It is sometimes shortened to datacom.

data communications and terminal subsystems
The methodology used to connect all asynchronous devices to a 900 Series HP 3000, except for the system console.

default
A predefined value or condition that is assumed, and used by the operating system if no other value or condition is specified.

device adapter
A device that manages communications between the computer and a peripheral device. It is the same as an I/O interface card.

device class
A collection of devices that have some user-defined relation. The file system supports a means of maintaining collections of devices but is cognizant of the relation only for certain device class names.

device file
A file associated with a non shareable device (a spool file). Input and output spool files are identified by a number in the `DFID` (device file identification) column of the `SHOWIN` and `SHOWOUT` command displays. A device file can also refer to any non-disk device, such as `$STDIN` and `$STDLIST`, the default input and output device files for a terminal.

device independence
A characteristic of the operating system that allows users to selectively redirect input or output from a program, session, or job using the `FILE` command without regard to the nature of the device. File equations created with the `FILE` command are in effect only for the duration of the job or session in which they were defined.

device subtype
A number ranging from 0 to 15 that defines a specific device and its associated software driver. There can be several device subtypes within one basic type. For example, a graphics terminal and one without graphics capabilities can share the same device type, but are assigned different subtype numbers.

device type
A number that defines a type of device. For example, 0 represents a moving-head disk and 16 is the device type number assigned to line printers.

diagnostician capability (DI Capability)
A capability usually assigned only to the Hewlett-Packard customer engineer (CE). It allows the CE to conduct certain CPU and diagnostic tests.

directory
A system table showing the group or account in which a file is located. A directory may contain other information such as size of the file, its creation date, any modification dates, file creator, or file security information.

DISCFREE
A utility that supplies information about a system's unused disk space, transient and permanent space, and the volume's total space capacity. The information is supplied in either a histogram or a condensed format. Equivalent to the MPE V/E **FREE5** utility.

disk
A circular plate of magnetically coated material used to store computer data. A disk may be fixed, removable, hard, or flexible.

disk drive
A peripheral device that reads information from and writes information to the disk.

disk file
A file stored on disk.

disk I/O
The electromechanical process of transferring the code and data that are stored on disk to and from main memory.

disk pack
A set of one or more disk platters stacked inside a plastic cylindrical container.

disk sector
A section of a disk's surface. A file is stored in one or more sectors.

distributed systems line (DS Line)
The communication line between two computers, controlled by the distributed systems network.

distributed systems network (DSN)
A system of hardware and software data communications products spanning multiple Hewlett-Packard product lines.

distributed terminal controller (DTC)
An intelligent controller with microprocessors to handle workstation connection preprocessing and communications with the system.

DRT number
Device reference table number. The physical I/O address of a device controller, displayed in the second column of the I/O Configuration Table listed during the SYSDUMP dialog. An MPE V/E index into the DRT.

DUMP
A utility program that writes the current state of the system's main memory and secondary storage to tape for analysis. DUMP also, optionally, attempts a software reboot from disk.

EXCLUSIVE access
A restriction limiting file access to one user at a time. EXCLUSIVE access is particularly important during file updates, when two or more people modifying the same record within a file, at the same time, could destroy data consistency.

execute
To carry out the instructions or to perform the routine indicated by entering a command or program name.

executing state
The state of a job or session when it is in progress. Other possible states are INTRO, WAIT, EXEC*, and SUSP.

extent
A group of one or more contiguous sectors on a volume used to allocate permanent disk space. Extents can be variable length; any number of extents can exist for a given file.

file
A group of related records that represents ASCII text (text files) or binary data (such as executable code). Every file must have a file name so the user can access the file's contents.

file code
A four-digit integer that identifies the special function of a file. Users can assign a file code between 0 and 1023 to a file they create to classify it according to its purpose.

file equation
A method of equating a file name to a device or another file. The FILE command is used to establish the relationship of the file to the device. Generally used to direct the input to or output from a program, job, or session to a particular device by referring to the device class, such as TAPE or LP.

file identifier
A number associating a name with a file system object. The file identifier is given to users to access objects via the file system.

file name
A string of up to eight alphanumeric characters, the first of which must be an alphabetic character. The file name is assigned when the file is created or first saved.

file number
An integer value assigned by the FOPEN intrinsic that is used to refer to a file in a user program. File numbers zero through seven are reserved for the operating system.

file space
The number of sectors of disk space that a user, group, or account is using. It is determined by executing the REPORT command.

foreign disk
A non-system domain disk that MPE V/E does not recognize as a private volume or serial disk. Foreign disks are non shareable devices, and can be formatted either sequentially or for direct record access. Foreign disks, such as private volumes and serial disks, do not have entries in the system volume table.

formal file designator
An alias file name that is used either programmatically or in a file equation to refer to a file. The formal file designator is not the file name found in the system file directory.

free space map
A map of allocated and available disk sectors on the volume set.

fully qualified file name
A complete file description that includes the file name, the group to which the file belongs, and the account to which the the group belongs. The fully qualified file name of the LETTER file in the PUB group of the SYS account is expressed as LETTER.PUB.SYS.

function keys
Special keys on the terminal keyboard that are labelled sequentially, F1, F2, F3, and so on, and that correspond to the windows that appear at the bottom of the terminal screen. Function keys perform various activities.

Fundamental Operating Software (FOS)
The programs, utilities, and subsystems supplied on the master installation tape (MIT) for MPE.

group
Part of an account that is used to organize the account's files. All files must be assigned to a group. Each group must have a unique name within an account. Groups are the smallest entity for which use of system resources is reported. A PUB group is designated for each account when it is created. Additional groups are created within the account, as needed, by the account manager.

group-level security
The file access modes, and the types of users to whom they are available, as specified by the account manager when the group is created. File access modes assigned to a group are limited to those types permitted to the account.

group librarian capability (GL capability)
A capability assigned by the account manager to a user within an account. A group librarian is allowed special file access modes for the maintenance of certain files within the user's home group.

hard reset
A method of resetting the computer or a terminal. A hard reset erases all information in memory.

hardware
All the physical components of the computer, including the CPU cabinet, tape drives, disk drives, terminals, and other peripherals.

help facility
An online utility providing information on all commands. Information can be accessed by topic areas and tasks.

Hewlett-Packard Data-Link Control II (HP-DLC-II)
A standard that defines the elements and procedures for a balanced, bit-oriented, Level II protocol of the Open Systems Interconnection (OSI) model.

Hewlett-Packard Graphics Language (HP-GL)
The graphics instruction set for Hewlett-Packard film recorders and plotters.

Hewlett-Packard Interface Bus (HP-IB)
A channel consisting of an HP-IB cable connected to an HP-IB interface card that is connected to the system's backplane. It performs protocol translation between the CPU and HP-IB. For the 900 Series HP 3000 system up to six devices can be connected to a single HP-IB channel. Disk drives, tape drives, and system printers are connected via an HP-IB which is HP's implementation of the IEEE standard 488-1975 interface.

High Level Data-Link Control (HDLC)
Types of protocols that eliminate much of the handshaking (and resultant time-consuming line turnarounds).

histogram
A graphical representation of data.

home directory
The default group, within an account, used as the current working directory when none is specified at logon time.

home group
The group to which a user is automatically logged on to if no other group is specified with the `HELLO` or `JOB` command. If no home group is assigned, the user must always specify a group when logging on. The account manager assigns the home group when a user's name is first defined.

host computer
1) The primary or controlling computer in a multiple computer installation. 2) In a network, the computer that primarily provides services such as computation, database access, or special programs or programming languages, to other users on the network.

implied run
The ability to run a program without explicitly using the `RUN` command. In MPE/iX it is not necessary to specify `RUN FCOPY.PUB.SYS` to invoke and run the FCOPY program. It is only necessary to enter `FCOPY`.

incremental backup
A backup strategy where a full backup is done once a week and partial backups are done on every other work day.

initial program load (IPL)
The initialization procedure that causes an operating system to begin operation.

initial system loader (ISL)
The software used to bring up MPE/iX or to perform a memory dump to tape. It provides a user interface to obtain information about or to alter the bootpath.

input
1) The data to be processed. 2) The process of transferring data from external storage to the computer.

input/output (I/O)
The process of, or equipment used in, transmitting information to or from the computer.

input priority
A number in the range of 1 (lowest priority) to 14 (highest priority) assigned to input jobs. The input priority can be assigned by the system (default is 8) or by the user. Jobs with a input priority less than or equal to the system outfence (default 7) are deferred.

`INSTALL`
The MPE/iX initial system loader (ISL) utility that performs a system load from tape and builds essential operating system files and data structures on disk. Equivalent to the MPE V/E `RELOAD` operation.

interactive session
A session that allows users to enter commands and data at the terminal and receive an immediate response. Interactive sessions are useful for data entry and retrieval, text editing, or program development where direct dialog with the computer is preferred.

interactive access capability (IA capability)
A capability assigned to accounts and users allowing users to initiate sessions with the `HELLO` command.

interactive user
A user who enters commands at a terminal.

I/O bay
A cabinet containing the card cages and device controller boards for peripherals connected to the HP 3000.

I/O dependent code (IODC)
The portion of the operating system software that contains I/O module dependent data and code used by Processor Dependent Code (PDC) in configuring the I/O module and in booting the system.

I/O path
The address of the interface hardware and the physical path to reach a device. It is constructed top down from where the device is physically attached to the system. The path is determined by the CIO adapter module number, the device adapter (DA) slot number, and the device address.

job
A method of submitting a single command to process multiple operating system and utility commands. Once submitted, the job executes independently of the user's session. Jobs are used to compile source programs, modify files, or perform other functions not requiring user interaction.

job limit
A limit set to manage the number of jobs executing on the system. The system manager or operator can restrict system usage by reducing the number of jobs allowed to run. If the `LIMIT` command is used to set the job limit to `0` (zero), no additional jobs can log onto the system.

keyword
A word assigned a specific meaning by the operating system, a subsystem, a computer language, or a utility.

keyword parameters
Words that have special meaning to the command interpreter and are used to modify the intent or effect of an MPE command. Keyword parameters, unlike positional parameters, may appear in any order after a command has been entered on the command line. An entire keyword parameter group, such as `PASS=password`, must be separated from other keyword parameters by a semicolon (`;`).

LAN 3000/XL LINK
The hardware and communications software needed to connect 900 Series HP 3000 machines to a network for system-to-system communication.

LAN cables
Cables used to connect the distributed terminal controller (DTC) and the system.

LDEV number
See logical device number.

library
A file containing a set of procedures and variables that can be accessed by programs.

Local Area Network (LAN)
A computer network confined to a single location. For example, connecting two or more computer systems within a single office together creates a LAN.

Local Area Network Interface Controller (LANIC)
A hardware card that fits into the backplane of the HP 3000 system and provides a physical layer for IEEE 802.3 local area networks.

local network
The network to which the local node belongs.

local node
The system where you are physically located and logged on, and at which you enter commands.

locked state
The status of an output spoolfile when it is unavailable for printing.

lockword
A word used as a security device on files. A lockword can be assigned to a file when it is created or renamed, and must be supplied to regain access to the file. The word can be from one to eight alphanumeric characters long and must begin with an alphabetic character.

log file
A file that maintains a record of events. Each event is recorded in a separate log record, and is correlated with the job or session causing the event.

logging
1) The process of recording all system modifications to a tape or disk file for the purpose of recovery or accountability. If the system fails, the log file can be used to restore the system to its

state prior to the failure. 2) The process used by DBCore to record the activity of a DBEnvironment to enable either rollback or rollforward recovery if necessary.

logging shutdown
A shutdown marking the end of the logging cycle. In most cases, it is performed just prior to either system or database backup.

logical device (LDEV)
A disk file, a set of disk files, or a physical device associated with a data stream between a host and a remote system.

logical device number
A number assigned to all hardware components of a computer system and used for identification purposes.

logoff
A method of terminating a session. To log off the system, enter the `BYE` or `EXIT` command.

logon
A method of initiating a session. To log on to MPE/iX, enter the `HELLO` command and a valid user and account name, plus a group name if necessary, and any required passwords.

logon group
The group specified when logging on using the `HELLO` command. The syntax is *username.accountname, groupname*. Once the desired group is accessed, resident files can be referred to without fully qualifying them.

logon identity
A security device used to verify users to the system. A logon identity includes a valid user name and account name in the form *user.account*.

logon prompt
A system prompt that indicates the computer is ready to initiate a session.

logon session
An identification device used when logging on. The correct syntax is *sessionname,username.accountname*.

master volume
The only volume needed to define a volume set. It contains the configuration data, the root directory, a free space map, file label table, and a volume label with a unique volume set ID for the volume set.

member volume
A volume containing a volume label indicating that it belongs to a volume set. It may be used by one or more volume classes.

memory error logging
A facility that records all memory errors. It begins automatically when the system is initialized.

memory mapped I/O
A configuration in which each device or I/O interface card is assigned a set of memory locations, or memory mapped I/O registers.

menu
A display on the terminal screen showing the options available within a program. Many application programs use menus to show the options a user can select.

MPE/iX
Multi-Programming Executive with integrated POSIX. The operating system for the 900 Series HP 3000 computers. MPE/iX manages all system resources and coordinates the execution of all programs running on the system.

multiple RIN capability (MR capability)
A capability assigned to accounts and users allowing a user multiple RINs (resource identification numbers) so they can lock more than one resource or device at a time. MR capability is usually restricted to only a few users, since simultaneous resource locking can lock (or hang) the entire system.

multiple RINs
The mechanism that allows an account, group, or user to lock more than one resource at a time by specifying the multiple RIN (MR) capability with the `ALTACCT`, `ALTGROUP`, or `ALTUSER` commands.

native mode (NM)
The native run-time environment of MPE/iX. In native mode, source code has been compiled into the native instruction set of the 900 Series HP 3000 system.

network
A group of computer systems connected so that they can exchange information and share resources.

network administrator capability (NA capability)
A capability that allows a user to manage the data communications subsystem at a specified location.

network architecture
A structured, modular design for networks.

network services (NS)
A group of software products that provide the user interface to the network. They allow batch jobs submittals, file transfers, virtual terminal access, and other services.

node
One end of a communications link or a computer system in a network. For example, if two HP 3000 computers are connected via a DS line, each system is considered a node.

node manager capability (NM capability)
A capability assigned to users allowing them to control communications subsystems at their node.

node name
A string of up to 31 characters, not including control characters or spaces, that uniquely identifies a node on a local area network (LAN).

non-shareable device capability (ND capability)
A capability assigned to accounts and users allowing account members to own non-shareable devices such as unspooled tape drives and line printers, serial disks, private volumes (on MPE V/E), and foreign disks.

nonsystem volumes
Volumes that are member volumes of a volume set. They do not need to be mounted for the operating system to run.

operating system
The software that allows the computer to operate. It consists of programs such as basic file and I/O manipulators. All subsystems run upon the operating system.

operator command
Commands executed only at the system console by the system operator. Operator commands can be distributed to specific users at the operator's discretion with the `ALLOW`, `ASSOCIATE`, and `JOBSECURITY` commands.

`OPERATOR.SYS`
The user and account that MPE automatically logs on to at the console when the system is started. `OPERATOR.SYS` may or may not be assigned special capabilities. Unlike the system supervisor (who is assigned OP capability), or the system manager (who is assigned SM capability), there is no mnemonic that entitles the operator to execute a special subset of commands. The operator's power and responsibilities derive solely from control of the system console and any capabilities assigned to it by the account manager of the `SYS` account.

optional parameter
A parameter that is not required when entering a command or calling an intrinsic. In reference manuals, optional parameters are surrounded by square brackets ([ ]).

outfence
A number in the range of 1 (lowest priority) to 14 (highest priority), used to control access to the system printer. If a job does not have an input priority higher than the system outfence (default 7), it will not print.

output
Data transferred from internal to secondary (external) storage in a computer. Also, the process of transferring information from the computer to a peripheral device.

output priority
A number in the range of 1 (lowest priority) to 13 (highest priority) assigned to an output spool file either by the system (a default value) or by a user. It is used to determine the order in which files will be printed.

parameter
A value in a list of values that is passed to a procedure. The parameter is used in calculations or operations in the procedure.

path
The course within a computer that a message takes, typically through software protocol handlers.

peripheral
A hardware device attached to and controlled by a computer, such as a terminal, tape drive, disk drive, or printer.

permanent file
A disk file with an entry in the system directory. To delete the file, it must be erased from the system with the PURGE command or with certain invocations of the FCLOSE intrinsic.

permanent space
Disk space reserved for use by permanent structures such as files, the label table, or the free space map.

port
An outlet from the computer used to connect the computer to peripheral devices. A cable runs between the outlet and the device.

positional parameters
One or more terms appearing in a specific order on the command line that modify the intent or effect of the command. If a positional parameter is omitted, the user must supply a comma in its place.

power down
To turn the system power off.

power up
To turn the system power on.

preventive maintenance (PM)
The regular housecleaning chores performed to keep the system from suffering performance degradation and to prevent problems from developing on the system.

primary boot path
The path used to boot the system from disk-resident software.

priority request
The use of the optional parameter `;HIPRI` in the `HELLO` and `JOB` commands. This capability, granted to system supervisors and system managers, allows a job to be dispatched or a session to be initiated, overriding the current jobfence or execution limit.

private volumes
MPE V/E removable disk volumes that are not included in the system I/O configuration table and, therefore, must be brought online with an explicit `LMOUNT` command. To access a private volume, a user's logon group and account must be assigned to a specific volume set with the `VS` parameter of the `ALTGROUP` and `ALTACCT` commands. Private volumes are nonsystem domain devices. Equivalent to MPE/iX mountable or nonsystem volumes.

privileged mode capability (PM capability)
A capability assigned to accounts, groups, or users allowing unrestricted memory access, access to privileged CPU instructions, and the ability to call privileged procedures.

process
The unique execution of a program or procedure by a particular user at a particular time. If several users execute the same program, each is a separate process. Similarly, if the same user runs several programs, each execution is also considered a distinct process.

process handling capability (PH capability)
A capability optionally assigned to accounts, groups, and users allowing a currently executing process to create other processes. PH capability also allows process suspension, interprocess communication, and process deletion. Since the proliferation of processes results in heavy system resource usage, PH capability is typically restricted to only a few users.

process identification number (PIN)
A number assigned to a process by MPE when the process is created. It is used internally by MPE (in the process control block (PCB) table) and during requests for system resources at the console (when the operator responds to requests by referencing the PIN in the REPLY command).

processor dependent code (PDC)
An MPE/iX hardware routine to read and initialize the I/O paths used for booting or rebooting the system.

program
A sequence of instructions that tells the computer how to perform a specific task.

programmatic sessions capability (PS capability)
A capability allowing a user to execute the STARTSESS command and to call the STARTSESS and ABORTSESS intrinsics.

prompt
The character(s) displayed at the terminal screen indicating that the system is ready for a command. The default MPE command interpreter's prompt is a colon (:). Other subsystems have different prompts.

PUB group
A group created when an account is created whose files are usually accessible to all users within the account.

PUB.SYS
The public group of the system account. PUB.SYS is the group in which programs and applications available to all users of the system reside.

quiet mode
A session mode in which messages sent from other jobs or sessions to a terminal are not displayed. Users control quiet mode with the SETMSG command. To determine who is running quietly, execute the SHOWJOB command. Those sessions not receiving messages are indicated by the word QUIET in the third column of the listing. A WARN message from the system console overrides quiet mode, and should be used for all critical communication, such as informing the user of an impending system shutdown.

remote access
Communication with a computer from a physically separate location.

remote mode
A mode in which a terminal transmits and receives data from a remote (or host) computer.

remote node
A node that is not physically located where you are and which you communicate with via data communication.

remote session
A session initiated from an area physically separated from the computer.

remote system
A computer system physically separated from other computer systems.

remote system console
A terminal which provides remote access to the SPU as a system console or terminal session.

remote terminal
A terminal that is indirectly connected to the computer, using a modem and telephone hook up.

required parameter
A parameter that is required when entering a command or calling an intrinsic. In reference manuals, required parameters are surrounded by braces ({}).

resource
Any device or item used by a computer, for example I/O devices, disk files, or programs.

resource identification number (RIN)
A number identifying a user-defined resource. Users are normally allowed to lock only a single RIN, which means they can have exclusive access to one resource at a time, such as an I/O device, a file, or a program.

resource sharing
The most significant feature of a network. With resource sharing, elements at each node are accessible from other nodes in the network. These elements may include disk files, printers, magnetic tapes, terminals, and other programs.

response center support (RCS)
An HP support agreement coverage that provides telephone assistance with software usage and problems.

restore
The process of retrieving user files from `SYSGEN` (MPE/iX), `SYSDUMP` (MPE V/E), and `STORE` tapes or from serial disk and writing them to disk. Restoring is executed with the `RESTORE` command.

restricting data
A way of limiting access to data by grouping data into volumes, volume classes, and volume sets.

run
To execute a program.

run time
The environment in which a process is running or executing.

save files capability (SF capability)
The capability allowing users to save the files they create. It is assigned by default to accounts and users.

search path
A mechanism that controls which file is opened once a command is determined not to be a UDC nor an MPE command.

sector
A portion of a track on a disk, and the smallest addressable piece of the disk. MPE-formatted disks use 128-word sectors (256 bytes).

security
1) The provisions that prevent unauthorized users from entering the system, accessing data, or using resources, programs, or capabilities. 2) The provisions included in MPE to protect the system from unauthorized use. MPE offers several methods of creating a secure environment. The most basic level of security includes organizing files into groups and users into accounts, either of which may be assigned a password. Security also refers to the ability to read, write, append, lock, and execute files, optionally assigned to accounts by the system manager and to groups and users by the account manager.

segmented library (SL)
A file structure containing code segments that are shareable, general-use MPE, utility, and subsystem procedures not unique to a particular process. The three levels of SLs are group library SL, available to any user who can access the group; the public library SL, accessible to account users; and the system library SL, used by all system users.

session
A mode in which the HP 3000 system is used interactively by entering commands and data through a terminal's keyboard and receiving immediate responses to input. A session is initiated with the `HELLO` command and is ended with the `BYE` command, or a second `HELLO` command that logs the user off the first session and onto another session.

single-user mode
A DBEnvironment startup mode that allows only one DBE session to be active at a time.

single-user state
A condition of the MPE/iX operating system in which the system console provides the only communication mechanism between the system and its user.

single-user system
A system that can communicate with only one fixed terminal.

soft reset
A reset that initializes a variety of terminal functions but does not reset the memory.

software
A set of programs, instructions, rules, and procedures concerned with the operation of a computer.

spooling
An activity that permits the concurrent use of output devices and batch job input. (SPOOL is an acronym for simultaneous peripheral operations online.) If multiple users send output to a nonshareable device, such as a tape drive or line printer, their output is directed to spool files on disk. The output is printed on a priority basis as the printer becomes available and the users can proceed with other processing activities without waiting for the printer. Multiple batch jobs can also be submitted concurrently. The jobs are spooled to disk and executed according to the priority level specified by its submitter with the `JOB` command.

spool queue
Disk space where spool files are kept.

`START`
An initial system loader (ISL) utility and its options that is used to start the system from disk and to build the system data structures. This utility is used to recover from a hang or failure or to reboot the system after scheduled downtime. The `START RECOVERY` option is equivalent to the MPE V/E WARMSTART procedure, and the `START NORECOVERY` option is equivalent to the MPE V/E COOLSTART procedure.

`$STDIN`
A system-defined file name that refers to the standard input device used to initiate a session or job; usually a terminal keyboard, card reader, or tape drive.

$STDLIST
A system-defined file name indicating the standard job or session listing file corresponding to the particular input device being used. The listing device is usually a printer for batch jobs and a terminal for sessions.

storage device
A device (such as a disk pack, a disk cartridge, a flexible disk, magnetic tape, or cartridge tape) onto which data can be stored and subsequently retrieved.

STORE
1) The process of saving HP 3000 files to tape or serial disk. Storing is executed by using the **STORE** command. 2) A machine instruction that tells the CPU to take information from a register and put it in memory.

stream
To run batch jobs or data from a session or a job by using the MPE **STREAM** command. Once a job is streamed, it will execute as a separate process without requiring any further user input or supervision.

subsystem
A software program that performs a specific function, such as compiling programs, copying files, or editing text. Subsystems are executed by entering a single command at the colon prompt. At that point a different prompt is displayed, and a set of commands specific to the subsystem become available to the user. The user must explicitly exit the subsystem, usually by entering **E** or **EXIT**.

SYS account
A special account on the HP 3000 system, included with the system when it is first installed. It contains all MPE files (stored in the segmented library), supported subsystems, utility programs, and compilers.

system
A group of one or more CPUs that communicate through buses without the use of data communications software.

system abort
An orderly system failure. MPE trys to clean up by closing files and flushing buffers when possible.

system configuration
The process of tailoring the operating system to accommodate the current physical layout and workload of a particular installation. The configuration is typically modified when new terminals, another line printer, or a disk drive are added. The system also can be reconfigured to assign new class names to existing devices, change the size of system tables or virtual memory, modify system logging, or alter any other configuration parameter.

system console
1) A workstation given a unique status by the operating system. It is used by the operator to execute specific commands for the purpose of managing sessions, jobs, and system resources. It is associated with all boot or system loader error messages, system error messages, and certain system status messages. 2) The terminal, usually logical device 20, that the system operator uses to monitor system activity, respond to resource requests, and send messages to user's terminals. The console (and its associated privileges and responsibilities) may be transferred to another logical device with the `CONSOLE` command.

system control panel
A panel on the computer, containing control switches and status indicator lights.

system-defined files
The files defined by MPE and made available to all users to indicate standard input or output devices, special temporary files, and files opened for output that do not perform an actual write operation.

system disk
The disk volume mounted as logical device 1. It contains MPE, I/O configuration information, the account structure and file directory, and utilities and subsystems. It also contains an area reserved for virtual memory and can be used to store user files.

system domain
An MPE V/E configuration for disk drives. System domain disks contain only shareable files, and remain online until the system is shut down. Because information about all system domain disks is entered into the system volume table, a system domain disk can be taken offline only by altering the I/O configuration during the SYSDUMP dialog and coldloading the new configuration. Equivalent to MPE/iX system volume.

system failure
An internally detected error from which recovery is not possible. Rather than continue to operate, risking data integrity, the operating system halts the computer.

system file directory
A directory maintained by MPE that records the name, group, and account of each permanent file on the system. The directory contains the size of each file, its location on the disk, who may access it, and other information.

system generator (`SYSGEN`)
The MPE/iX utility used to create or modify system and I/O configurations; add, remove, and replace program files and boot files; replace system libraries; generate a full system backup; and

create a boot tape to bring up an MPE/iX system with the new configuration. Equivalent to MPE V/E SYSDUMP and INITIAL utilities.

system halt
The condition following a system shutdown or system failure, indicated by no response at the system console or to any user command.

system load tape
A tape that contains the system load utilities, base system files, and user files. It is generated with the SYSGEN utility. Equivalent to the MPE V/E coldload tape.

system logging
The facility that records details of system resource requests in a series of log files on disk. The system manager or operator can select which system events to record such as job or session initiation or termination, program termination, file closing, file spooling completion, and system shutdown. I/O device failures are recorded in the system log and are used to detect problems before they interfere with overall system operation.

system manager
The person who manages the computer installation, is responsible for creating accounts, and assigns capabilities and resource limits.

system manager capability (SM capability)
A capability assigned to the user name and account to which the person designated as system manager logs on. The system manager is responsible for the structure, security, and overall operation of the system by establishing accounts and assigning capabilities and resource-use limits to each. The system manager assigns account manager and system supervisor capabilities to specific users.

system processor unit (SPU)
The box in which all the processor boards and cards reside.

system startup
A method of loading the MPE operating system from either disk or tape by bringing a subset of the MPE initiator program into memory.

system supervisor capability (OP capability)
A capability assigned by the system manager to the system supervisor's user name and account. The system supervisor is responsible for performing backups, altering the system configuration, and in general, tuning the computer so that it continues to perform well and meet the needs of users.

system volume
An MPE/iX system volume set. It contains a bootable system image and system configuration on its master volume. It is the only volume needed to load and start the system. It is always mounted and named `MPEXL_SYSTEM_VOLUME_SET`.

temporary file
A file that exists only for the duration of a session or job.

terminal
A hardware device connected to a computer and used for entering and receiving data. A terminal consists of a keyboard and a display screen.

terminal type
Hewlett-Packard's classification for terminal models and their capabilities.

throughput
A measurement of a computer system's speed and productivity.

transaction
A logical unit of work.

transaction logging
A method of tracking each unit of work to facilitate recovery from the abnormal end of transaction processing and system failures. A transaction log file is automatically generated and maintained by the transaction management facility. Files can be restored to a consistent state by copying the contents of the log file into the data file.

transient space
Disk space used for temporary processes such as stacks and operating system data structures.

unit number
A part of an address used for devices. A number whose meaning is software-dependent and device-dependent, but which is often used to specify a particular disk drive in a device with a multidrive controller.

`UPDATE`
1) The MPE/iX `ISL` utility that performs a system load from tape. It replaces the current base system files on disk, and optionally replaces configuration files. The ISL `UPDATE CONFIG` option is equivalent to the MPE V/E `COLDSTART` procedure, and the `UPDATE NOCONFIG` option is equivalent to the MPE V/E `UPDATE` operation. 2) An MPE V/E coldload option that loads all files in the `PUB` group of the `SYS` account from the backup media. I/O configuration data, the directory, and user files are loaded from the system disk. `UPDATE` is typically used to install a new version of system software or to load MPE from another

computer. Equivalent to the MPE/iX **ISL UPDATE** utility **UPDATE NOCONFIG** option.

use communications subsystems capability (CS capability)
A capability assigned to accounts and users allowing access to the MPE communications subsystems.

user command
A set of MPE/iX commands that a user has grouped together to perform a specific task. A user command is stored in a command file and does not have to be entered into a catalog. User commands are last in MPE's search path for commands.

user level security
The file access modes permitted the user. User level security must duplicate, or be a subset of, the file access permitted the user's account and group.

user logging
A facility that enables users and subsystems to record additions and modifications to files. If necessary, user logging also provides the means whereby recorded entries can be used to recover the files themselves.

use volumes capability (UV capability)
A capability assigned at the account and user level allowing users to access private disk volumes.

utility program
An operating system program that performs specific functions such as file copying, sorting, merging, memory dump analysis, or monitoring available disk space.

variable
A value that can be changed, as opposed to a constant, usually represented by a letter or a group of alphanumeric characters.

volume
A single disk pack. Each volume is a member of a volume set and contains a volume label, a label table, and a free space map.

volume class
A class used for the allocation and restriction of disk space. A volume class is a logical subset or partition within a volume set and can bridge any number of physical member volumes of a volume set.

volume name
The name given to a volume set or volume class with the **NEWSET** command. The name can be assigned only by a user with CV (create volume) capability, usually the system manager or account manager. The volume name is an ASCII character string of up

to eight alphanumeric characters, beginning with an alphabetic character.

volume number
The part of an address used for a device number whose meaning is software and device dependent, but is often used to specify a particular volume on a multivolume disk drive.

volume set
A group of up to 255 related disk packs. One volume of the volume set must be designated as the master volume for the set. Each volume set is assigned a name by which it is identified and referenced. MPE/iX recognizes both system volume sets and nonsystem, or mountable, volume sets.

volume set information table (VSIT)
A part of a master volume of a volume set containing the volume set configuration data.

volume testing
The verification that the system continues to operate when loaded to each limit, the determination of what occurs when those limits are exceeded, and the determination of what occurs when the system is emptied after being in a full state.

VOLUTIL
The MPE/iX utility that provides volume initialization and maintenance, volume label and membership inquiries, and volume space and sector status. Equivalent to the MPE V/E `VINIT` subsystem.

welcome message
A file containing a greeting and important system information. It is created by the system operator and displayed each time a user logs onto the system.

work file
A temporary file created when a text editor is invoked. A work file is a copy (in memory) of a permanent disk file. Any changes to the work file are lost unless the user saves the updated version of the file.

write
To put information in a certain place.

write-enable
To remove a disk's write-protection, allowing the disk to be written upon.

write-protect
To protect stored data so that it cannot be overwritten.

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