HEWLETT PACKARD

RTE-A
Primary System Software

Installation Manual

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Printing History

The Printing History below identifies the edition of this manual and any updates that are included. Periodically, update packages are distributed which contain replacement pages to be merged into the manual, including an updated copy of this printing history page. Also, the update may contain write-in instructions.

Each reprinting of this manual will incorporate all past updates; however, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with its user-inserted update information. New editions of this manual will contain new information, as well as all updates.

To determine what manual edition and update is compatible with your current software revision code, refer to the Manual Numbering File or the Computer User's Documentation Index. (The Manual Numbering File is included with your software. It consists of an "M" followed by a five digit product number.)

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Preface

This manual contains procedural steps for installing the RTE-A Primary System software on your HP 1000 A-Series Computer system. The information is presented in the following two chapters and appendixes:

Chapter 1 Defines the possible hardware configurations with the A-Series Computer system and identifies the media on which the RTE-A Primary System can be supplied.

Chapter 2 Presents step-by-step instructions for installing RTE-A and booting the system from CS/80 cartridge tapes, 1600 BPI magnetic tapes, and SCSI DDS tapes.

Supplementary information is contained in Appendixes A through D.

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Introduction

This manual contains instructions for installing the RTE-A Primary System software on HP 1000 A400, A600+, A700, A900, or A990 computer systems configured with any supported combination of hard disk drives and tape drives. Refer to the System Configuration section of this chapter for the disk drives that can be used with the A-Series computers.

Procedures contained in this manual are to be performed after successful completion of hardware installation/configuration, described in the appropriate HP 1000 computer installation and service manual.

- For A400 computers, manual part number 02134-90001.
- For A600+ computers, manual part number 02156-90002.
- For A700 computers, manual part number 02137-90002.
- For A900 computers, manual part number 02139-90002.
- For A990 16-slot computers/systems, manual part number 02939-90001.
- For A990 20-slot computers/systems, manual part number 02959-90002.
- For Micro 14/16 computers, manual part number 02420-90001.
- For Micro/1000 systems, manual part number 02430-90010.
- For Model 26/27/29 systems, manual part number 02196-90002.

The Primary System is a tested, factory preconfigured operating system. It provides a starter system that can be used to demonstrate the RTE-A system operations and to test the functions of the installed hardware. It may also be used by all levels of users to gain familiarity with the RTE-A system features. It can then be used by the System Manager or a superuser to regenerate a customized system. Once you have created a regenerated system, you should perform periodic backups of your system. Backup utilities are described in the *RTE-A Utilities Manual,* part number 92077-90004.

Software Media

The RTE-A Primary System software is supplied on SCSI DDS tape, CS/80 cartridge tape, or 1600 bpi magnetic tape. See Appendix C for software media part numbers and file names.

Primary System software on DDS, CS/80, and 1600 bpi media is copied by first booting !RESTORE, which manages restoration of the Primary System. !RESTORE is located on the first tape and the Primary System software is located on a second tape. The Master files (the system relocatables) are included on a third tape. They can optionally be restored to hard disk after the Primary has been restored.

Refer to the *RTE-A System Generation and Installation Manual,* part number 92077-90034, for instructions on regenerating a new system.

Some products also include diagnostics in self-booting form on the !RESTORE tape and in a special format (restored by !RESTORE) on the Primary tape. For more information on these diagnostics, see Appendix C.

System Configuration

The following disk drive configurations can be used with the A-Series computers:

Computer	**Compatible Drives**
Model 26/27/29/99 (20-slot box)	Command Set 80 (CS/80), SCSI
Micro/1000 (16-slot box)	Command Set 80 (CS/80), SCSI or Micro/1000 Integrated Fixed/Flexible
Micro 14/16 (6-slot box)	Command Set 80 (CS/80), SCSI

Refer to the installation and service manual for your system for hardware installation and configuration information. The Primary System requires that your system disk and the tape drive from which you will be loading the Primary be at specific select codes and bus addresses. Refer to Table 2-1 in Chapter 2 for the required configuration information for your system disk and loading tape device. Refer also to Appendix B for a complete description of the Primary System configuration.

The remainder of this chapter contains configuration rules and peripheral device information. After your hardware configuration and installation is complete, go to Chapter 2 for information on powering up your system and installing the RTE-A Primary System software.

Note The Primary System software (without the relocatable files) is installed on the Micro/1000 integrated fixed disk in system products HP 2484B, 2486B/C, 2487B, 2489B, and 2989A before shipment from Hewlett-Packard.

Configuration Rules

The following configuration rules appear in the *HP 1000 A-Series Computer Systems Ordering Guide.* The rules are reprinted in this manual for your reference when configuring your A-Series system.

General Rules

Memory

Main and disk memory must be sufficient to satisfy the memory requirements of the operating system, all additional Hewlett-Packard software, and anticipated requirements for user-developed applications.

Tested Peripheral Devices

Only currently supported devices have been tested for correct functioning when interfaced as indicated and when used in accordance with the configuration rules in this section. As appropriate, they have also been qualified for safety under UL, CSA, and IEC standards and have been checked to ensure that they meet U.S. and German regulatory requirements for Electro-Magnetic Interference (EMI). Other devices, including for example, new Hewlett-Packard terminals, printers, disks, or older discontinued devices may be functionally compatible and usable. However, until they have been tested and appear in the Ordering Guide, along with appropriate interface and use recommendations, they are **NOT SUPPORTED** for use on HP 1000 A-Series systems. Such use, and any adverse consequence arising from it, is solely the customer's responsibility.

Maximum I/O Channels

A maximum of 48 I/O interfaces is supported in A-Series computers and I/O Extenders. However, the number of usable devices is limited by RTE-A system table space.

Card Cage Capacity

The computer must provide enough card cage slots to house the CPU card(s), all required memory cards, and all interfaces and any other plug-ins that use card cage slots, with the addition of an I/O Extender if necessary.

Rear Doors

The rear doors must be installed on all packages to support proper cooling and to avoid damage to the installed cards from excessive heat build-up.

I/O Extender Exclusions

All disk interfaces must be installed in the computer card cage. Disk interfacing is **NOT** supported in the I/O Extender. The battery backup card and the control store cards are **NOT** supported in the I/O Extender.

Maximum Number of Magnetic Tape Units per System

No more than two magnetic tape units are supported per HP 1000 A-Series system. This applies only to magnetic tape units, **NOT** cartridge tape units.

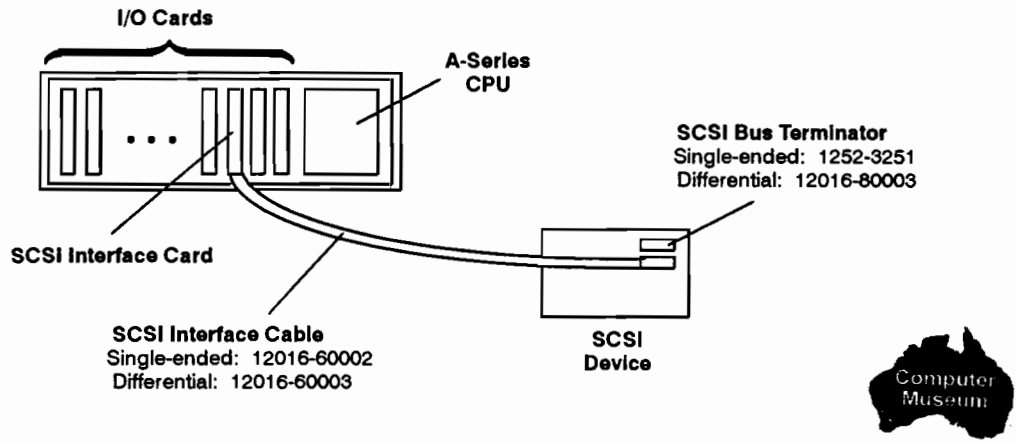
SCSI Bus Configuration Rules

Up to seven devices may be connected to the HP 12016A SCSI Interface. The SCSI Interface card may be connected to either single-ended or differential SCSI devices; however, single-ended and differential devices must not be intermixed on the same bus. Devices connected to the same card must be either all single-ended (using the standard cable) or all differential devices (using the differential cable HP 12016A option 001).

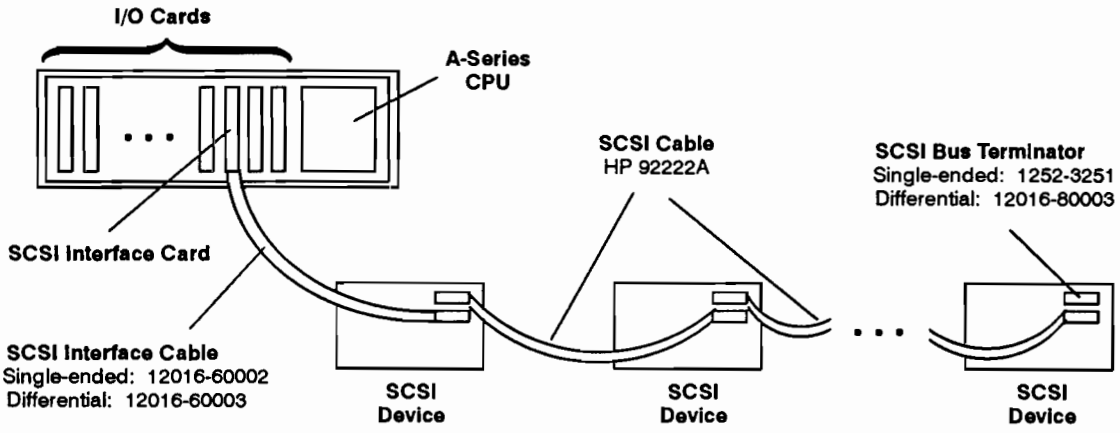
SCSI devices must be connected to each other in daisy-chain fashion. Star configurations are not supported with SCSI. In addition, the last device in the chain must have a SCSI bus terminator installed to replace the second SCSI device connector.

The specific rules for configuring SCSI bus connections are as follows:

1. The interface card MUST be connected to one end of the cable.
2. The appropriate bus terminator must be connected to the other end of the system. See Figure 1-1. A terminator is supplied with the HP 12016A SCSI Interface.
3. The total cable length connected to the bus MUST not exceed 6 meters for a single-ended bus and 25 meters for a differential bus. For example, with 7 devices connected to the same bus, using a single-ended SCSI cable from the HP 12016A card to the first device, six device interconnect cables are required. By using the HP 92222A 0.5 meter cable, the total cable length would be (6 x 0.5 meters) +2 meters (HP 12016A cable) for a total of 5 meters.
4. SCSI devices are available with many different connectors for bus connections. The HP 12016A cables are designed to mate with a 50-pin D-type connector. Adaptors are available from the *HP Computer Products* catalog.
5. HP will not be responsible for the operation of non-HP products or cables.



Single Device Configuration



Multiple Device Configuration

Notes:

1. The above diagrams show typical installations of the SCSI card in a 20-slot box configuration. The SCSI card can be installed similarly into a 6-slot or 16-slot box.
2. Only one SCSI card is shown in each computer. Multiple SCSI cards can be installed in the backplane in any priority slot.
3. The first I/O slot to the right of the CPU for an A900 configuration is not shown although the SCSI card is supported in that slot.
4. The top and bottom cable connectors on the back of the SCSI devices are equivalent. Cables or bus terminators may be connected to either one.

Figure 1-1. SCSI Card Typical Installation

HP-IB Configuration Rules

High Speed and Normal Speed Devices Cannot be Used Together on the Same HP-IB Interface

IEEE Standard 488-1978 identifies two modes of operation for the bus. The two modes allow designers to trade design complexity for bus speed. The Normal Speed mode offers maximum flexibility, lowest cost design, and longest cable lengths at a bus speed to 500 KB/second. The High Speed mode supports data rates to 1 MB/second, subject to the conditions noted in the next paragraph.

The following conditions must be met for High Speed mode operation:

1. All devices expected to talk need a 350 ns T1 data settling time.
2. High speed devices must use 48-milliampere tri-state line drivers.
3. Capacitive load on any lead except REN or IFC must be less than 50 picofarads.
4. All devices in the system must be powered on.
5. Cable length is limited to 1 meter per device load (a total maximum of 15 meters).

IEEE Standard 488-1978 warns "WARNING: Anytime a device following condition 1 is placed on a system, even if higher speed is not intended, there may be data transfer errors if conditions 2 through 5 are not met for that system." If conditions 2 through 5 are not met, the talker cannot guarantee that the data has settled before it asserts DAV (DAta Valid). This error mechanism is likely to be a problem in systems with longer cable length.

Note Speeds of HP-IB devices are indicated in the tables in the Peripheral Device Support section, later in this chapter.

Customer needs have generated specific peripheral configurations that do not conform to all the aforementioned requirements. Extensive field testing has been conducted on these systems to ensure satisfactory performance and supportability.

These systems have stringent requirements that **MUST** be followed to guarantee reliability and quality.

The system requirements for various peripheral configurations are listed in the remaining paragraphs of this section. Any violation of these requirements will result in a system for which HP cannot guarantee reliable operation. Such systems will **NOT** be supported.

Basic HP-IB Capacity

There are fourteen (14) Normal Speed devices per HP 12009A interface or eight (8) High Speed devices per HP 12009A interface.

Maximum of Four (4) Disks and/or Cartridge Tape Units

A limit of four disks and/or tape units per HP 12009A interface is supported because of the electrical loading of the HP-IB bus drivers by the disks, EXCEPT for the HP 12122A Integrated Disks. (The HP 12122A Integrated Disks use their own exclusive HP 12009A interface and no other disks or connections are supported from that interface.) *For the most satisfactory*

performance, the disks and cartridge tape units should be the only devices connected to their HP-IB interface. The HP-IB interface must be set to High Speed, the load resistors must be installed, and the cable length must be limited to 1 meter per device load for a maximum 12 meter cable length (7 resistors + 1 HP 12009A card + 4 devices = 12 loads).

Maximum of Two (2) Magnetic Tape Units

A limit of two magnetic tape units per HP 12009A interface is supported because of the electrical loading of the HP-IB bus drivers by the tape units. For an HP 7970E Magnetic Tape Unit, the HP-IB interface must be set to Normal Speed. For an HP 7974A, 7978B, 7979A, 7980A, or 7980XC Magnetic Tape Unit, the HP-IB interface must be set to High Speed, the load resistors must be installed, and the cable length must be limited to 1 meter per device load for a maximum 10 meter cable length (7 resistors + 1 HP 12009A card + 2 devices = 10 loads).

Magnetic Tape Unit on Same Bus as Disks or Cartridge Tape Units (NOT RECOMMENDED)

If an HP 7974A, 7978B, 7979A, 7980A, or 7980XC (High Speed) Magnetic Tape Unit is on the same bus as disks and/or cartridge tape units, the following three rules must be followed:

1. The HP 12009A interface must be set to High Speed.
2. The load resistor pack must be installed in the High Speed position on the HP 12009A interface.
3. The total cable length must not exceed 8 meters.

Otherwise, NO other device is supported on the same HP 12009A HP-IB interface as a magnetic tape unit. *For the most satisfactory performance*, magnetic tape units should be connected via their own HP 12009A HP-IB interface and disks and/or cartridge tape units should be connected via their own HP 12009A HP-IB interface.

HP-IB Extender Exclusion

Disks, magnetic tape units, and cartridge tape units are **NOT** supported via the HP 37203A (discontinued) or HP 37204A HP-IB Extender.

Maximum of Two (2) HP 256xA/B Line Printers

A limit of two line printers per HP 12009A interface is supported because of the electrical loading of the HP-IB bus drivers by the line printers. *No other device is supported on the same HP 12009A HP-IB interface as one or two HP 256xA/B Line Printers.*

Other HP-IB Printers, Maximum of Eight (8) Printers

For other HP-IB printers, a limit of eight is supported per HP 12009A interface.

Maximum of Fourteen (14) HP-IB Instruments or Plotters

A maximum of fourteen HP-IB instruments or plotters is supported on the HP 12009A interface with the card configured in the Normal Speed mode. *For the most satisfactory performance,* plotters should be connected via their own HP 12009A interface and instruments via their own HP 12009A interface.

Processor/Interface Specific Rules

CPU, Memory, and Control Store Frontplane Connections In the Micro/1000 Package

Frontplane connections require that the CPU, memory, and control store cards all be adjacent to each other in the card cage. This configuration rule limits to seven adjacent card cage slots, the maximum number of memory array cards that can be used in a Micro 27 or Micro 29 computer or SPU. The Micro 27 and Micro 29 computers and SPUs require four (4) slots for CPU and memory controller cards. Three (3) memory array and control store cards can be used in a Micro 27. Two (2) memory array cards and one (1) control store card can be used in a Micro 29. The two sections of the Micro/1000 card cage provide a total of 14 slots. The Micro 99 computers and SPUs require a single slot for the single-board processor which includes the memory controller and WCS. However, only four memory array cards (maximum of 32 MB of memory) can be used in the Micro 99.

25 kHz ac Supply for 1206xA/B Interfaces

The HP 12060B, 12061A, 12062A, and 12063A Analog and Digital I/O Interface cards all require 25 kHz AC from the computer power supply. Internally these interfaces convert the 25 kHz ac supply to isolated DC, which makes possible the isolation of inputs from outputs for maximum noise immunity. 25 kHz power ready for direct use by these interfaces is standard for the power supply in the 20-slot computers and the SPUs that incorporate those computers. An additional HP 12159A 25 kHz Sine Wave card is required for filtering of 25 kHz power in Micro/1000 computers and SPUs. The 6-slot computers do **NOT** have 25 kHz ac power supply available.

Peripheral Device Support

The following information on supported peripheral devices appears in the *HP 1000 A-Series Computer Systems Ordering Guide*. The information is reprinted in this manual for your reference.

Only the peripherals listed below are supported by Hewlett-Packard for use with HP 1000 A-Series Systems, effective with RTE-A revision 6.0. Use must comply with the configuration rules in the previous section. The devices listed here have been tested for correct functioning when interfaced as indicated and, where applicable, have also been qualified for safety under UL, CSA, and IEC standards and have been checked to ensure that they meet U.S. and German regulatory requirements for Electro-Magnetic Interference (EMI).

Note that currently-available peripherals are listed in **boldface** type. Discontinued peripherals are listed in lighter type as a reference only.

Other devices, including new Hewlett-Packard terminals, printers, and disks, or older discontinued ones may be functionally compatible and usable, but until they have been tested and appear in this section, along with appropriate interface and use recommendations, they are NOT supported for use on HP 1000 A-Series Systems. Such use, and any adverse consequence arising from it, is solely the customer's responsibility.

Table 1-1. System Console and Additional Terminals

Product Number and Name		Connects to system via	
		12040D or A400 Multiplexer and	**12005B with Cable Option**
C1001x‡ **C1064x‡** **C1065x‡** C1003x† 2393A 2397A	**700/92 Display Terminal** **700/96 Display Terminal** **700/98 Display Terminal** 700/41 Terminal Graphics Terminal Color Graphics Terminal	40242M cable (40242Y cable for A400 OBIO)	002
Vectra Model PCs with AdvanceLink		24542M cable	Not supported
2382A 2392A 2621B 2625A 2628A 45610B 45850/1A	Office Display Terminal Display Terminal Display Terminal Dual System Terminal Word Processing Terminal Touchscreen Terminal Touchscreen Terminal	40242M cable (40242Y cable for A400 OBIO)	
2622A 2623A 2624B 2626A 2627A	Display Terminal Graphics Terminal Display Terminal Display Station Color Graphics Terminal	13222Y cable	001 or 005

‡ *C1001x can be C1001A/G/W (Amber/Green/White display).*
‡ *C1064x,can be C1064A/G/W (Amber/Green/Whie display); C1065x can be C1065A/G/W.*
† *C1003x can be C1003A/G. C1003x is a "dumb" terminal that is NOT usable as a system console. It does not support "CI stack" or Edit/1000 screen mode. Users must write their own device driver for the C1003x terminal.*

Table 1-2. HP-IB Disks (Available)

Product Number and Name or Type		Connects via Interface Product No.	Support Code
C2200A	**330 MB Disk Drive**	**HP 12009A** (Fast)	**B** ☆
C2202A	**670 MB Disk Drive with Cache**	**HP 12009A** (Fast)	**B** ☆
C2203A	**670 MB Disk Drive**	**HP 12009A** (Fast)	**B** ☆
12122A	Integrated 20 MB Fixed and 270 kB	HP 12009A	B ☆
9122C	Dual 2 MB Microfloppy Disk	HP 12009A (Normal)	B ☆
9133H/L	20/40MB 3 1/2-Inch Floppy	HP 12009A (Normal)	B ☆
9134H/L	20/40 MB Fixed Drive	HP 12009A (Normal)	B ☆
9153C	20/40 MB Winchester Disk, available with integrated 2 MB Microfloppy drive	HP 12009A (Normal)	B ☆
9154C	40 MB Fixed Drive	HP 12009A (Normal)	B ☆
9262B	152 MB Removable Disk	HP 12009A (Fast)	B ☆
9263B	304 MB Removable Disk	HP 12009A (Fast)	B ☆

Support Codes: **B** = Boot device **L** = Load Device

☆ *Requires a separate 1600 cpi Magnetic Tape Unit, Cartridge Tape Subsystem, or DDS tape subsystem for software installation and/or backup.*

Table 1-3. SCSI Disks (Available)

Product Number and Name or Type		Connects via Interface Product No.	Support Code
C1701A	650 MB Rewritable Optical Disk	HP 12016A	B, L ☆
HARD DISK DRIVES:			
Device and Enclosure Type	**Supported Device Upgrade Kit in Enclosure Specified in First Column**		
C2212A 330 MB Disk Drive in rack-mountable enclosure C2213A 660 MB Disk Drive in rack-mountable enclosure	**C2290A 330 MB Disk** **C2291A 660 MB Disk** **C2292A 1.3 GB DDS (DAT)** **C2294A 650 MB Magneto-Optic** **C2295B 1.3 GB Disk** **C2297A 2.0 GB DDS (DAT)**	**HP 12016A**	**B, L ☆**
C2214B 670 MB Disk Drive in rack-mountable enclosure	**C2292A 1.3 GB DDS (DAT)** **C2294A 650 MB Magneto-Optic** **C2295B 1.3 GB Disk** **C2297A 2.0 GB DDS (DAT)**		
C2216T 670 MB Disk Drive in mini-tower enclosure **C2217T 1.3 GB Disk Drive in mini-tower enclosure**	**C2292T 1.3 GB DDS (DAT)** **C2294T 650 MB Magneto-Optic** **C2297T 2.0 GB DDS (DAT)** **C2473T 670 MB Disk** **C2474T 1.3 GB Disk**		
C2460F 422 MB Disk Drive in mini-tower enclosure **C2461F 670 MB Disk Drive in mini-tower enclosure** **C2462F 1.3 GB Disk Drive in mini-tower enclosure**	**C2472F 422 MB Disk** **C2473F 670 MB Disk** **C2474F 1.3 GB Disk** **C2475F 1.3 GB DDS (DAT)** **C2477F 2.0 GB DDS (DAT)**		
C2460R 422 MB Disk Drive in rack-mountable enclosure **C2461R 670 MB Disk Drive in rack-mountable enclosure** **C2462R 1.3 GB Disk Drive in rack-mountable enclosure**	**C2472R 422 MB Disk** **C2473R 670 MB Disk** **C2474R 1.3 GB Disk** **C2475R 1.3 GB DDS (DAT)** **C2477R 2.0 GB DDS (DAT)**		
C2481A 670 MB Differential Disk in mini-tower enclosure **C2482A 1.3 GB Differential Disk in mini-tower enclosure**	**C2491A 670 MB Differential Disk** **C2492A 1.3 GB Differential Disk**		

Support Codes: B = Boot device L = Load Device

☆ *Requires a separate 1600 cpi Magnetic Tape Unit, Cartridge Tape Subsystem, or DDS tape subsystem for software installation and/or backup.*

Table 1-4. Disks (Discontinued)

Product Number and Name or Type			Connects via Interface Product No.	Support Code
7907A	41	MB Fixed and Removable Disks	HP 12009A (Fast)	B ☆
7911P/R	28	MB Fixed w/CTU	HP 12009A (Fast)	B, L
7912P/R	65	MB Fixed w/CTU	HP 12009A (Fast)	B, L
7914P/R	13	MB Fixed w/CTU	HP 12009A (Fast)	B, L
7914CT	131	MB Fixed w/CTU	HP 12009A (Fast)	B, L
7914TD	131	MB Fixed Disk with 1600 cpi MTU	HP 12009A †	B, L
7914ST	131	MB Fixed Disk with 1600 cpi MTU	HP 12009A (Fast)	B, L
7933H	404	MB Fixed Disk	HP 12009A (Fast)	B ☆
7933XP	404	MB Fixed Disk with Cache	HP 12009A (Fast)	B ☆
7935H	404	MB Removable Media Disk	HP 12009A (Fast)	B ☆
7935XP	404	MB Removable Media Disk w/Cache	HP 12009A (Fast)	B ☆
7936H	307	MB Fixed Disk	HP 12009A (Fast)	B ☆
7936XP	307	MB Fixed Disk with Cache	HP 12009A (Fast)	B ☆
7937H	571	MB Fixed Disk	HP 12009A (Fast)	B ☆
7937XP	571	MB Fixed Disk	HP 12009A (Fast)	B ☆
7941A	23	MB Fixed Disk	HP 12009A (Fast)	B ☆
7942A	23	MB Fixed w/CTU	HP 12009A (Fast)	B, L
7945A	55	MB Fixed Disk	HP 12009A (Fast)	B ☆
7946A	55	MB Fixed w/CTU	HP 12009A (Fast)	B, L
7957A/B	81	MB Fixed Disk	HP 12009A (Fast)	B ☆
7958A/B	130	MB Fixed Disk	HP 12009A (Fast)	B ☆
7959B	304	MB Fixed Disk	HP 12009A (Fast)	B ☆
7962B	152	MB Fixed Disk	HP 12009A (Fast)	B ☆
7963B	304	MB Fixed Disk	HP 12009A (Fast)	B ☆
9895A	2.3	MB Dual Flexible Disk Drive	HP 12009A (Normal)	B ☆
7906M	19.6	MB MAC Master Cartridge Disk	HP 12009A ‡ (Fast)	B ☆
7920M	50	MB MAC Master	HP 12009A ‡ (Fast)	B ☆
7925M	120	MB MAC Master	HP 12009A ‡ (Fast)	B ☆

Support Codes: **B** = Boot device **L** = Load Device

☆ *Requires a separate 1600 cpi Magnetic Tape Unit or Cartridge Tape Subsystem for software installation and/or backup.*

† *The 7914TD requires a fast HP 12009A interface to the Disk, a normal HP 12009A interface to the MTU.*

‡ *The 7906M, 7920M, or 7925M Disk also requires a 12745D HP-IB Adapter in its disk controller.*

Table 1-5. Tape Drives

Product Number and Name		Connects via Interface Product No.	Support Code
C1503B	**2.0 GB DAT Tape Drive**	**HP 12016A**	**B, L**
C1511A	1.3 GB DAT Tape Drive	HP 12009A	P
C1512A	1.3 GB DAT Tape Drive	HP 12016A	B, L
C1520B	**2.0 GB DAT Tape Drive**	**HP 12016A**	**B, L**
C1521B	**8.0 GB DAT Tape Drive**	**HP 12016A**	**B, L**
7979A	**Autoloading 1600 cpi MTU ◆**	**HP 12009A** (Fast)	**B, L**
7980A	**Autoloading 1600/6250 cpi MTU ◆**	**HP 12009A** (Fast)	**B, L**
7980XC	**Autoloading 1600/6250 cpi MTU ◆ w/data compression**	**HP 12009A** (Fast)	**B, L**
7980S	**SCSI Autoloading 1600/6250 cpi MTU**	**HP 12016A**	**B, L**
7980XS	**SCSI Autoloading 1600/6250 cpi MTU w/data compression**	**HP 12016A**	**B, L**
35401A	**Autochanger Cartridge Tape S/S**	**HP 12009A** (Fast)	**B, L**
9144A	16-Track Cartridge Tape S/S	HP 12009A (Fast)	B, L
9145A	32-Track Cartridge Tape S/S	HP 12009A (Fast)	B, L
7974A	1600 cpi MTU ◆	HP 12009A (Fast)	B, L
7978B	6250/1600 cpi MTU	HP 12009A (Fast)	B, L
7970E†	1600 cpi MTU	HP 12009A (Normal)	B, L
7971A‡	1600 cpi MTU	HP 12009A (Normal)	B, L

Support Codes: **B** = Boot device **L** = Load Device
P = Usable only as peripheral disk

◆ *7979A, 7980A, 7980XC, or 7974A Option 800, which adds 800 cpi capability, is also supported.*

† *7970E requires interface option 626 or 636.*

‡ *7971A requires interface option 140.*

Table 1-6. Printers

Product Number	and Name	Connects via Interface+Cable
C2106A	**DeskJet 500 Printer**	12040D◆+13242N
2225D	**150 cps ThinkJet**	
2227A	**160 cps QuietJet Plus**	
2228A	**160 cps QuietJet**	
2276A	**DeskJet Printer**	
2277A	**DeskJet Printer Plus**	
2684A	LaserJet Printer 2000	
2686A	LaserJet Printer	
2686A+300	LaserJet Plus Printer	
2235B/D	**480 cps RuggedWriter**	12040D◆+92219G
2563A/B+049	300 LPM Line Printer	
2563C+049	**300 LPM Line Printer**	
2564C+049	**600 LPM Line Printer**	
2565A/B+049	600 LPM Line Printer	
2566A/B+049	750 LPM Line Printer	
2566C+049	**750 LPM Line Printer**	
2932A	200 cps G. P. Printer	
2934A	**200 cps Office Printer**	
2684A	**LaserJet/2000 Printer**	12040D◆+40242M
2684D	**LaserJet/2000 Printer**	
2687A	LaserJet Printer	
2864P	**LaserJet/2000 Printer**	
33440A	LaserJet II Printer	
33449A	**LaserJet III Printer**	
33459A	**LaserJet III D Printer**	
33471A	**LaserJet Printer**	
33471A	LaserJet II P Printer	
33481A	**LaserJet III P Printer**	
33491A	**LaserJet III SI Printer**	
3630A+001	**167 cps PaintJet**	
2562C	**420 LPM Line Printer**	12009A (Normal) (supports two 256xC Opt 214 printers; second printer will require a 10833C cable)
2563C+214	**300 LPM Line Printer**	
2564C+214	**600 LPM Line Printer**	
2566C+214	**880 LPM Line Printer**	
2235B/D	**480 cps RuggedWriter**	12009A (Normal) (+10883x cable for 2nd through 8th device on the HP-IB bus)
2934A+046	**200 cps Office Printer**	
2563A/B+214	300 LPM Line Printer	12009A (Normal) (supports two 256xA/B or 2608SR option 214 printers; second printer will require a 10833C cable)
2565A/B+214	600 LPM Line Printer	
2566A/B+214	880 LPM Line Printer	
2608SR+214	400 LPM Line Printer	
2671A/G	120 cps Thermal Printer	12009A (Normal) (+10833x cable for 2nd through 8th device on the HP-IB bus)
2673A/G	120 cps Intelligent Graphics Printer	
2932A+046	200 cps G. P. Printer	

◆ 12040D supports up to 8 devices, each requiring its own cable

Table 1-7. Plotters and Graphics Tablet

Product Number and Name		Connects to system via Interface+Cable
7440A+001 **7475A+001** **7570A**	**ColorPro Plotter** **Graphics Plotter** **DraftPro Plotter**	**12040D◆+13242N**
7550A	**Graphics Plotter**	**12040D◆+17355D**
7440A+002 **7475A+002** **7550A** **7570A+17570A**	**ColorPro Plotter** **Graphics Plotter** **Graphics Plotter** **DraftPro Plotter**	**12009A** (Normal) (+10833x cable for 2nd through 8th device on the HP-IB bus)
7470A+001 7580A/B+060 7585A/B+060 7586A/B+060 7595A 7596A	Graphics Plotter Drafting Plotter Drafting Plotter Drafting Plotter DraftMaster Plotter DraftMaster Plotter	12040D◆+13242N
7510A	Film Recorder	12040D◆+17355D
7470A+002 7580A/B+060 7585A/B+060 7586A/B+060 9111A+100	Graphics Plotter Drafting Plotter Drafting Plotter Drafting Plotter Graphics Tablet	12009A (Normal) (+10833x cable for 2nd through 8th device on the HP-IB bus)
◆ 12040D supports up to 8 devices, each requiring its own cable.		

2

Installing the Primary System

The Primary System, when supplied on SCSI DDS, CS/80 cartridge, or 1600 bpi magnetic tapes, consists of three tapes that contain the following:

1. The BOOTABLE tape which contains the bootable subsystem !RESTORE needed to restore the Primary tape. !RESTORE is a memory-based system that runs the FST utility.

2. The PRIMARY tape which contains the Primary System software in FST format to be restored.

3. The RELOCATABLES tape which contains the RTE-A relocatable files needed for system generation and program linking.

Refer to Appendix C for more detailed information on the RTE-A software media.

System Disk and Loading Tape Drive Configurations

Make sure that the select code and bus address configuration of your system disk and tape drive are as listed in Table 2-1. This is required by the Primary installation process.

An RTE-A system may be installed with various combinations of hard disk and tape drives. Depending on the combination desired, select codes 25B and 26B or select code 27B will be used.

For example, to install RTE-A from 1600 bpi magnetic tape to a CS/80 disk, set the HP-IB select code to 27B. To install RTE-A from CS/80 cartridge tape to SCSI hard disk, set the HP-IB select code to 26B and the SCSI select code to 27B.

Powering Up the System

Power up your A-Series computer system as follows:

1. Verify that there are no duplicate select codes on the interface cards, using the following list as a reference:

   - 23B for the HP 12040 8-channel multiplexer (Revision A, B, or C)
   - 30B for the HP 12040 8-channel multiplexer (Revision D)
   - 20B for the HP 12005 ASIC card
   - 77B for the A400 (HP 12100A) on-board 4-channel multiplexer

   Note that the A400 on-board MUX is hard-wired to 77B and cannot be changed.

2. Set the disk power switches to ON.

3. Set the power switch on the terminal to be used as the Virtual Control Panel (VCP).
4. Verify that VCP is enabled on one interface only. This is done by using switch U1S1 on the HP 12005 ASIC or HP 12040 8-channel MUX, or switch U1001S7 on the A400 4-channel MUX. The switch on the VCP interface must be closed; the VCP enable switch on all other interfaces must be open.
5. Set the computer main power switch to ON. When the computer is powered on, the computer self-test is executed. At the completion of the self-test, the system console displays the VCP power-up message. The VCP power-up message gives information such as number of I/O cards installed, amount of memory installed, and VCP revision. Refer to your installation and service manual for more information about the VCP power-up message.

Table 2-1. Primary System Hardware Configuration Requirements

SYSTEM DISK					TAPE DRIVE				
Interface	**Model**	**SC**	**Addr**	**LU**	**Interface**	**Model**	**SC**	**Addr**	**LU**
SCSI	Hard Disk	27	6	10	SCSI	7980S	27	3	5
	MO Disk	27	5	12		DAT	27	3	14
					HP-IB	7974/78/80	26	3	37
						7970	26	4	38
						9144/45	26	1	39
						Integrated CTD	26	2	54
Interface	**Model**	**SC**	**Addr**	**LU**	**Interface**	**Model**	**SC**	**Addr**	**LU**
HP-IB	CS/80 Disk	27	2	16	SCSI	7980S	25	3	35
	CS/80 (20Mb) Disk	27	2	30		DAT	25	3	44
					HP-IB	7974/78/80	27	3	7
						7970	27	4	8
						9144/45	27	1	9
						Integrated CTD	27	2	24

Summary of the Installation Procedure

The Primary System installation procedure consists of the following steps; details of these steps are given in the sections that follow:

1. Load the tape labeled BOOTABLE and boot !RESTORE (the memory-based version of FST).

2. When !RESTORE has loaded, the !RESTORE ready message will appear on the screen and you will be prompted to load the tape labeled PRIMARY.

3. You will then be prompted by a series of questions to supply information regarding your system configuration.

4. !RESTORE then completes the installation process by initializing your system disk, restoring the Primary System, (optionally) installing the diagnostics, (optionally) restoring the relocatable files, installing BOOTEX, and booting the Primary System.

The relocatable files contained on the third tape are necessary if you plan to regenerate your system or if you want to re-link any programs. These files can be restored to disk at the end of the installation process (after the Primary System tape has been restored) if desired. You may choose not to restore the relocatables at this time. If so, the relocatable tape can be restored at any time in the future using the FST utility supplied with RTE-A. Refer to the *RTE-A Utilities Manual*, part number 92077-90004, for information on using FST. Note that the installation process to restore the Primary System uses a memory-based version of FST; however, this is transparent to the user and, therefore, no knowledge of using FST is required.

Figure 2-1 is a flowchart diagram of the Primary installation process performed by !RESTORE.

Before Beginning the Installation Procedure

Before you begin the Primary installation procedure, note the following:

1. If the disk currently contains data, you should first **back up the disk**. Installing the Primary overwrites data on the disk!

2. If your system disk has never been "formatted" (as in the case of a disk that is right out of the factory box with no factory-installed software) !RESTORE cannot initialize the disk LU and perform the installation. Refer to Appendix A for instructions on formatting your disk.

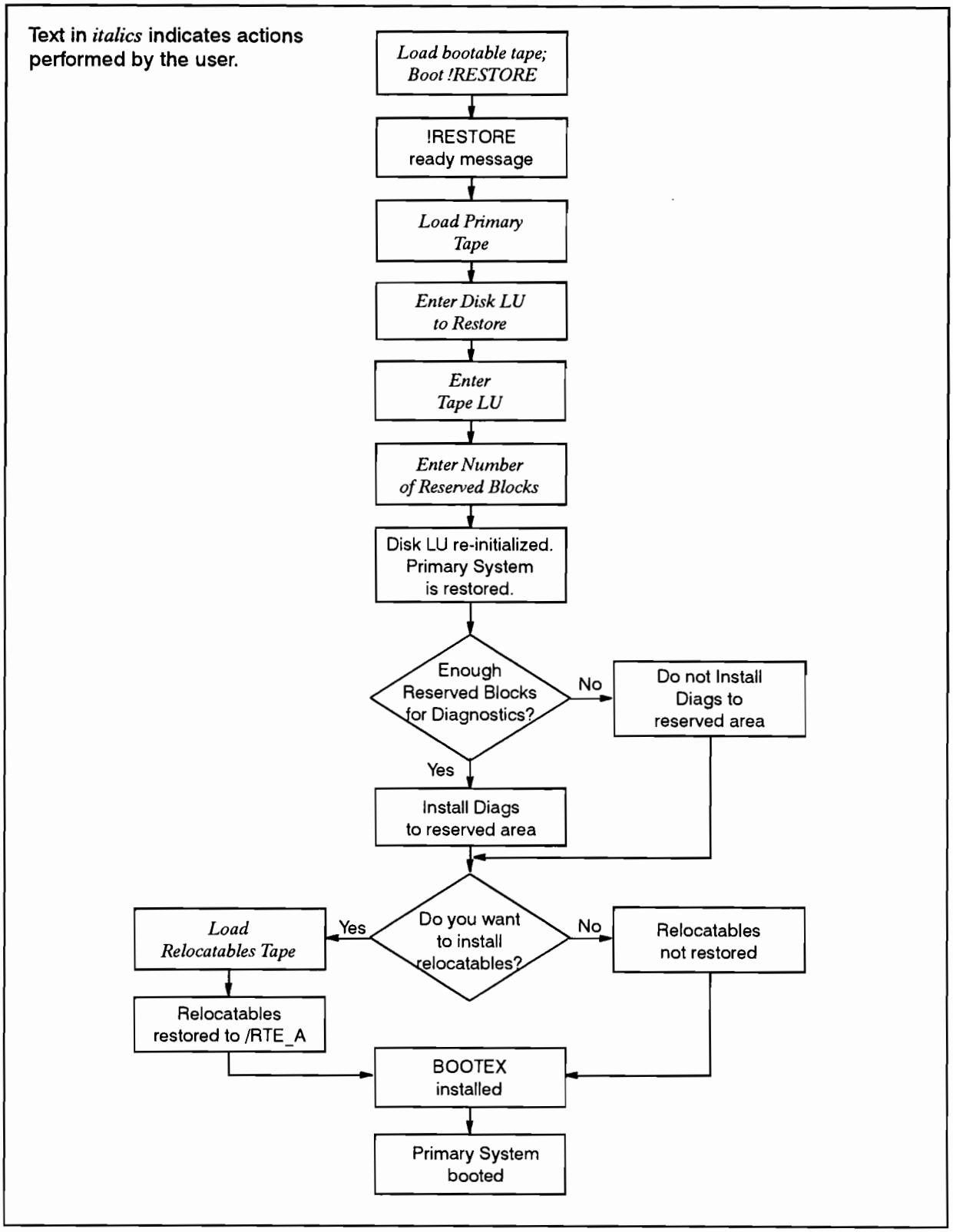


Figure 2-1. Flowchart of !RESTORE Primary Installation Process

Loading the Tapes

Follow the appropriate procedure, listed below, to load the Primary System tapes.

CS/80 Cartridge Tape

To load a CS/80 cartridge in its tape drive, proceed as follows:

1. Insert the cartridge into the drive with the label facing up.
2. The tape tension automatically adjusts and a self-test completes. The BUSY light flashes while the loading is in progress (approximately 50 seconds). When the BUSY light goes off and stays off, the loading is complete.

To unload a CS/80 cartridge, proceed as follows:

1. Press the UNLOAD button. The tape rewinds. The BUSY light stays on while the tape rewinds and goes off when the rewind is complete.
2. Press the EJECT button. Be sure to store the cartridge in its protective container.

SCSI DDS Tape

To load a DDS tape into the DAT drive, insert the tape into the drive with the label facing up. When the green light stays on, the loading is complete. To unload a DDS tape, press the eject button.

Magnetic Tape

Procedural steps for mounting and dismounting the magnetic tapes generally are found on the device, and the tape-loading path is engraved on the face of the tape deck.

When the tape is mounted on the supply (upper) hub and loaded on the take-up reel, do the following:

Note If your system has Revision 4020 or earlier of VCP, the HP 7979/7980 tape drives require a special procedure to be configure for HP 7974/7978 compatibility. For a copy of this procedure (which can be done from the front panel push buttons at the drives), contact your local HP sales office.

---

1. Press the LOAD button. The LOAD light goes on.
2. Press the ONLINE button. When the ONLINE light goes on, the tape drive is ready for the copy/restore operations.
3. At the end of the tape operation, press the RESET button, then the REWIND button to rewind the tape to the supply reel.

Booting !RESTORE

After installing the system hardware (including the disk drives and VCP terminal) and powering up as described in the appropriate system installation and service manual, load the tape labeled BOOTABLE.

!RESTORE is located at file 1 or 2 on the tape. Press <Break> to get the VCP prompt then enter one of the following bootstrings:

`VCP> %bdc1`*busc* for HP-IB Cartridge Tape Drives

`VCP> %bmt2`*busc* for HP-IB Magnetic Tape or SCSI Magnetic or DAT Tape Drives

where:

- *b* is the HP-IB or SCSI bus address of the device from which you are booting.
- *u* is the unit number of the device from which you are booting.
- *sc* is the select code of the interface of the device from which you are booting.

For example, the following bootstring would be used to boot !RESTORE from a SCSI DAT tape drive at bus address 3 and select code 27:

```
VCP> %bmt23027
```

Note Note that when booting from an HP 9145 tape drive, you may get the warning message "`IN ST 20 ...`". This message can be ignored. It means that the last request generated an error that recovered; no data was lost.

The following message appears when !RESTORE has successfully loaded:

```
*RTE-A READY*
************************************************************

 !RESTORE successfully loaded. Please remove the bootable
 tape and insert your PRIMARY tape.  The system disk
 interface may be either HP-IB or SCSI and the select code
 must be set to 27b.

************************************************************

Type Go <return> when the PRIMARY tape has been loaded.
```

Load the PRIMARY Tape

Remove the bootable tape from the tape drive and load the tape labeled PRIMARY. Enter 'go' to continue.

Entering System Configuration Information

!RESTORE will now prompt you to enter the following information regarding your system configuration. Be sure that you have removed the bootable tape and loaded the tape labeled PRIMARY before you enter your responses.

1. After the "`!RESTORE successfully loaded ...`" message is displayed and you entered 'go', the following system disk LU menu is displayed:

```
                                  select  bus
lu device name (device type)       code   addr

10 SCSI R/W disk (30)               27      6
12 SCSI MO disk (30)                27      5
16 CS/80 disk (33)                  27      2
30 CS/80 20 MB disk (33)            27      2

Enter the lu of the disk being restored (q=quit):
```

   Enter the appropriate disk LU depending on whether your system disk is HP-IB or SCSI. Your system disk must be configured at the select code and bus address given above for the disk LU that you select.

2. Enter the tape LU for your system. Depending on whether you entered a SCSI disk LU (LU 10 or 12) or an HP-IB disk LU (LU 16 or 30), one of the following menus is displayed:

   If you entered a SCSI disk LU:

```
                                  select  bus
lu device name (device type)       code   addr

 5 SCSI 7980S (24)                  27      3
14 SCSI DAT (24)                    27      3
37 HPIB 7974/78/80 (24)             26      3
38 HPIB 7970 (23)                   26      4
39 HPIB 9144/45 (26)                26      1
54 HPIB cartridge tape (26)         26      2

Enter the tape LU (q=quit):
```

   OR

   If you entered an HP-IB disk LU:

```
                                  select  bus
lu device name (device type)       code   addr

 7 HPIB 7974/78/80 (24)             27      3
 8 HPIB 7970 (23)                   27      4
 9 HPIB 9144/45 (26)                27      1
24 HPIB cartridge tape (26)         27      2
35 SCSI 7980S (24)                  25      3
44 SCSI DAT (24)                    25      3

Enter the tape LU (q=quit):
```

The two different menus are displayed because there are four possible Primary configurations. They are:

1) both disk and tape on a SCSI interface;
2) both disk and tape on an HP-IB interface;
3) disk on a SCSI interface with tape on an HP-IB interface; or
4) disk on an HP-IB interface with tape on a SCSI interface.

Refer to Table 2-1 for the select code, bus address, and LU values assigned to the configurations listed above.

3. You will now be prompted to enter the number of reserved blocks on your system LU. The following message is displayed:

```
The reserved area must be a multiple of 256 blocks.

1536 -  minimum reserved area for Primary installation
4352 -  minimum area required to install diagnostics

Enter the number of reserved blocks (q=quit) <1536> :
```

Enter the number of reserved blocks that you want !RESTORE to create during the restore process. It must be at least 1536 blocks for the Primary and it must be a multiple of 256.

The first 768 blocks of the reserved area on the Primary System are used to store BOOTEX for the system. The area after BOOTEX is used for the integrated CS/80 cartridge tape disk cache. If your system disk does not contain an integrated CS/80 cartridge tape, the reserved area from block 768 to block 1535 can be used to store a second BOOTEX.

If supplied, diagnostics are stored in the reserved area starting at block 1536. The diagnostics are supplied with the Primary System only if you received your software as part of an A-Series system product order (for example HP 2489B, HP 2484A, HP 2999A, etc.). During the installation process, !RESTORE restores the diagnostics to directories /BOOTABLE and /DIAGS, and then installs them into the reserved area so that they can be booted.

If you ordered RTE-A as product number HP 92077A, the diagnostics are not included and are, therefore, not installed on the disk.

Restoring the Primary System

Once you have entered the configuration information, a message is displayed confirming your configuration and prompting you to begin the restore process. For example, if you entered disk LU 12 and tape LU 54, the following message is displayed:

```
Tape LU = 54
Disk LU = 12
Restoring primary to a 64 MB disk

WARNING: disk lu 12 will be re-initialized.
Ok to begin restore [Y,<N>] ?
```

Note that the system disk LU will be re-initialized by !RESTORE. Enter 'y' if you want to restore the Primary system. Enter <cr> or 'n' if you do not.

After entering 'y', !RESTORE continues the installation process by creating the necessary directories on the system disk LU and copying the Primary System files to these directories. A series of FST messages will be displayed.

After the Primary System is installed on the hard disk, the following files/directories are stored on your system LU:

BOOTEX
DIAGNOSTICS * †
/SYSTEM
/PROGRAMS
/HELP
/LIBRARIES
/CATALOGS
/BOOTABLE *
/DIAGS *
/SCRATCH

* Included only if your Primary came with diagnostics.
† Installed in the reserved area if the number of blocks you selected was 4352 or greater, and your Primary came with diagnostics.

Restoring Relocatable Files

After the Primary System is restored, the following message is displayed prompting you to load the tape containing the relocatables. The relocatable files stored on this tape must be restored to your hard disk if you want to generate your own system.

```
Please load the tape containing the RTE-A relocatables.

Type Go <return> when ready to restore relocatables.
Press return to skip the restore.
```

If you want to restore the relocatable files, unload the PRIMARY tape and load the tape labeled RELOCATABLES.

Then, type 'go<return>'.

If you do not want to load the relocatable files, hit <return>.

Booting the Primary System

After the relocatables have been loaded (or you hit <return> if you did not load the relocatables), !RESTORE copies BOOTEX to the reserved area then boots the Primary System.

As the system is brought into memory, the following messages appear on the screen. Note that you are prompted to enter the current date and time.

```
* Define system and snap files
sy,primary.sys
```

```
sn,primary.snp
*
* Note: No FMGR cartridges are mounted.
*
* Define initially RP'ed programs
rp,drtr,d.rtr
rp,derr,d.err
*
rp,ci,cm
rp,cix
*
* RP the powerfail routine and DDC00/DDC01 modem handler
rp,autor
*
* Configure the system console
rp,ci,ci.s
rp,lucfg,prihp
st,,1
end
*
* End RP phase
* Define swap file
sw,swap.swp::system
      2048 blocks in swap file
*
end
Boot process complete

*RTE-A READY*
*
* /SYSTEM/WELCOME1.CMD:
* This file is designed to be edited according to your system config-
* uration. See RTE-A System Generation and Installation Manual concerning *
the functions of the WELCOME file. This reflects the terminals
* configured in the primary system (using #ANS), and should be modified
* according to your system configuration.
*
* remove the initializing program which dynamically configures LU 1 to
* the VCP port
OF,PRIHP,ID
PRIHP aborted
*
* Update /system/snap.snp for LINK program.  Note that if SNAP::0 exists,
*   LINK will search there first.  Be sure you do not have a SNAP on your
*   FMGR cartridges.
*
CO,/SYSTEM/PRIMARY.SNP,/SYSTEM/SNAP.SNP,D
Copying /SYSTEM/PRIMARY.SNP to SNAP.SNP::SYSTEM ... [ok]
*
WD,/PROGRAMS
SET,LOG,=,OFF
Enabling system console LU 1
RP,CI,CI.01
RP'ed CI.01
CN,1,20B,CI.01
CO,"MESS.TST::SYSTEM,1
Copying "MESS.TXT::SYSTEM to 1 ...
```

```
    @    @     @@@@@@          @    @@@@@@    @@@@@@    @@@@@@
    @    @     @    @          @    @    @    @    @    @    @
    @@@@@@     @@@@@@   @@@    @    @    @    @    @    @    @
    @    @     @               @    @    @    @    @    @    @
    @    @     @               @    @@@@@@    @@@@@@    @@@@@@

     @@@@      @@@@@@   @@@@@@   @@@@@@   @   @@@@@@   @@@@@@
    @    @     @        @        @    @   @   @
    @@@@@@ @@  @@@@@@   @@@@@@   @@@@@@   @   @@@@@@   @@@@@@
    @    @          @   @        @   @    @   @              @
    @    @     @@@@@@   @@@@@@   @    @   @   @@@@@@   @@@@@@

**************************************************************
*                                                            *
*           FOR AN INTRODUCTION TO THIS SYSTEM, TYPE:        *
*                                                            *
*                             HELLO                          *
*                                                            *
**************************************************************
[ok]
RP,LINK
RP'ed LINK
WS,LINK,32
*
* Set the time: tm <mon> <day> <year> <hr>:<min>:<sec>: <am/pm>
*
SET,LOG,=,OFF
```

If you are a new RTE-A user, you should run the HELLO program to learn more about the RTE-A Operating System.

Press the RETURN key to get the Command Interpreter prompt (CI.01>), then enter the time. The Command Interpreter is the primary program on RTE-A. If you see either the RTE prompt (RTE:) or the Command Monitor prompt (CM>), press the RETURN key again and wait for the CI prompt.

The software modules and manuals included in your system are listed in Software Numbering Catalog A92077 and Manuals Catalog M92077, in the directory /RTE_A. You can list the catalogs to your terminal with the following command sequence:

```
CI.01> li /rte_a/a92077          (list the software modules catalog)
CI.01> li /rte_a/m92077          (list the manuals catalog)
```

Use the PRINT utility to list the catalogs to the system printer. This utility is described in the *RTE-A Utilities Manual,* part number 92077-90004.

Refer to the *RTE-A System Generation and Installation Manual,* part number 92077-90034, for information on configuring the installed system for autoboot.

Rebooting the Primary System

If you need to *re*boot the Primary System from disk for any reason, you can use one of the following bootstrings:

```
VCP> %bdc
```

Note that the above bootstring uses the default boot parameters, that is select code 27 and bus address 2 for HP-IB or 6 for SCSI disk drives.

Primary System Answer File

The Primary System answer file (primary.ans) is supplied as a model for your own system generation. The Primary System is designed to be booted via either an HP 12005 ASIC card, HP 12040 8-channel MUX card, or A400 on-board 4-channel MUX. To achieve this, the system console is dynamically configured during the boot process by a program in the Primary System software called LUCFG. Therefore, the system console is not configured into primary.ans. For an example of the Primary System answer file, refer to the *RTE-A System Generation and Installation Manual.*

You must configure in the system console if you are doing your own generation. The program LUCFG is available only with the Primary System software and will run correctly only on the Primary System.

The Primary System is also designed to boot the Primary System from any disk (CS/80, SCSI Magneto Optical, or SCSI hard disk) only if its interface select code is 27B.

Generating Your Own System

After the Primary System has been restored, you may choose to have the relocatable files restored also. The relocatable files must be restored to your hard disk before generating your own system. For instructions on regenerating your system, refer to the *RTE-A System Generation and Installation Manual.*

Backing Up Your System

After installing the Primary System and regenerating, perform a physical backup of your system. This saves a physical snapshot of the disk and its exact contents. Use the ARSTR utility to perform a physical backup. Note that you will need a memory-based version of the ARSTR utility to do this. *After* you have regenerated your system, create a memory-based (offline) ARSTR. Refer to the *RTE-A Utilities Manual*, part number 92077-90004, for information on creating a memory-based ARSTR and using ARSTR.

Refer to the *RTE-A System Manager's Manual*, part number 92077-90056, for information on creating a backup strategy for your system.

A

Disk Formatting

Formatting utilities VSCSI and FORMC are supplied with the RTE-A Primary System. VSCSI is the SCSI verification program that can be used to format SCSI disks. It is supplied in bootable format (!VSCSI) and as an online program. Refer to the *HP 12016A SCSI Host Bus Adapter Card Installation and Reference Manual*, part number 12016-90001, for a description of VSCSI.

FORMC is a maintenance program for CS/80 disk and tape drives. You can use it to format an entire disk volume or tape, verify the integrity of data on the device, and correct any errors detected. FORMC is supplied in bootable format (!FORMC) and as an online program. Refer to the *RTE-A Utilities Manual*, part number 92077-90004, for a description of FORMC.

Note that the SCSI hard disks, HP 9133A/34A, CS/80 disks, and the integrated Micro/1000 disks are formatted before shipment from Hewlett-Packard.

Booting the Formatting Utility

Load the tape labeled BOOTABLE and, from the VCP terminal, enter one of the following bootstrings:

`VCP> %bmt`*busc* for SCSI DAT tape or 1600 bpi magnetic tape drive

`VCP> %bdc`*busc* for CS/80 cartridge tape drive

where:

b is the HP-IB or SCSI bus address of the device from which you are booting.
u is the unit number of the device from which you are booting.
sc is the select code of the interface of the device from which you are booting.

For example, the following bootstring would be used to boot from a SCSI DAT tape drive at bus address 3 and select code 27:

```
VCP> %bmt3027
```

A menu similar to the following appears, listing the utilities on the tape along with their associated file numbers:

FILE NAME	FILE NO.	FILE NAME	FILE NO.
!RESTORE	#	MTEXR	#
24612A	#	LANMEM	#
EXRTP(EXER&TAPE)	#	!VSCSI	#
OPER	#	!FORMC	#
MTVER	#		

where # is the file number for that bootable file.

Press BREAK to get the VCP prompt. Re-enter the bootstring using the file number (#) given in the menu above for the utility you want to boot. The file number precedes *busc* in the bootstring. For example, if !FORMC were listed at file number 45, you would enter:

```
VCP> %bdc45busc          to boot from CS/80 cartridge tape
```

Using VSCSI

When the boot process is complete and the VSCSI prompt is displayed, enter the LU number (10 for SCSI hard disk, 12 for SCSI Magneto Optical) and the FO command to format your SCSI disk, as follows (user input is underlined):

```
SCSI/1000 Verification program. Rev.6000
VSCSI>lu 10
VSCSI>fo
```

VSCSI will display the following message and prompt you to proceed with the formatting process. Enter 'y' at the proceed prompt.

```
Formatting the SCSI drive will DESTROY all data on the disk.
This includes all LUs defined for the drive.

OK to proceed [no]? y

Formatting.... Please be patient.
```

Using FORMC

When the boot process is complete and the '/FORMC' prompt is displayed, enter the FO (format) command, as follows:

```
/FORMC: fo,lu[,interleave]
```

where:

lu is the LU number of your system disk LU (16 for 64 Mbyte CS/80 hard disks, 30 for 20 Mbyte CS/80 disks)

interleave is the interleave factor (a decimal number between 1 and 32) to be assigned. The default is 1. It is recommended to use an interleave factor of at least 2 for any disks which include microfloppies (for example, the 9133 disk drive).

FORMC will display the following message and prompt you to proceed with the formatting process. Enter yes at the proceed prompt.

```
/FORMC: OK TO PROCEED (Y,N)?
```

Enter 'y' to begin the formatting process. When formatting is complete, FORMC issues the following message and exits:

```
/FORMC: DISK FORMATTING COMPLETED
```

Refer to the *RTE-A Utilities Manual,* part number 92077-90004, for more information on FORMC, and your disk reference manual for special instructions on formatting the disk.

B

Primary System Configuration

This appendix describes the devices configured into the Primary System, along with information on system resources that are generated into the Primary System. Table B-1 gives the LU assignments AFTER the system has been booted up. The LU assignments are grouped by select code for ease of reference.

The configuration of your system after you have booted the Primary depends on whether your system disk is SCSI or HP-IB. When referring to Table B-1 for configuration information, use the column labeled "Device on SCSI System" if your system disk is a SCSI disk; use the column labeled "Device on HP-IB System" if your system disk is an HP-IB disk.

Note that, in general, for the Primary your system disk (SCSI or HP-IB) must be at select code 27. Then, if your system disk is SCSI (referred to as a *SCSI system*), an additional HP-IB disk or tape drive must be at select code 26. If your system disk is HP-IB (referred to as an *HP-IB system*), an additional SCSI disk or tape drive must be at select code 25.

Table B-1. Primary System Configuration

Select Code	ADDR	LU	Device on SCSI System	Device on HP-IB System
25b	5	22 - 23	--	SCSI MO Disk
	3	44	--	SCSI DAT Tape
	3	35	--	SCSI 7980S Tape
	6	20 - 21	--	SCSI Hard Disk
	0	60 - 61	--	SCSI Flexible Disk
26b	2	26 - 27	HP-IB Disk	--
	2	40	HP-IB 20 Mbyte Disk	--
	2	41	HP-IB Flexible Disk, single-sided	--
	2	42	HP-IB Flexible Disk, double-sided	--
	2	54	HP-IB Cartridge	--
	1	39	9144/45 Cartridge	--
	0	28 - 29	2nd HP-IB Disk	--
	3	37	7974/78 Tape	--
	4	38	7970 Tape	--
	7	36	2392A Printer	--
	36b	25	HP-IB Controller	--
27b	2	16 - 17	--	HP-IB Disk
	2	24	--	HP-IB Cartridge
	2	30	--	HP-IB 20 Mbyte Disk
	2	31	--	HP-IB Flexible Disk, single-sided
	2	32	--	HP-IB Flexible Disk, double-sided
	1	9	--	9144/45 Cartridge
	0	18 - 19	--	2nd HP-IB Disk
	5	12 - 13	SCSI MO Disk	--
	3	7	--	7974/78 Tape
	4	8	--	7970 Tape
	3	14	SCSI DAT Tape	--
	3	5	SCSI 7980S Tape	--
	6	10 - 11	SCSI Hard Disk	--
	0	50 - 51	SCSI Flexible Disk	--
	7	6	--	2392A Printer
	36b	15	--	HP-IB Controller

The following devices have the same configuration for both the HP-IB and SCSI systems.

Select Code	LU	Device
20b	1	HP 26xx Default System Console on HP 12005 ASIC Card
77b	110	A400 On-Board I/O Port A Terminal
	111	A400 On-Board I/O Port B Terminal
	112	A400 On-Board I/O Port C Terminal
	113	A400 On-Board I/O Port D Terminal
30b	120 - 127	HP 12040 Rev. D 8-Channel MUX, Ports 0 – 7, respectively
23b	130 - 137	HP 12040 Rev. B or C 8-Channel MUX, Ports 0 – 7, respectively

System Resources:

Class numbers	150
Resource numbers	30
ID segments	150
Reserved partitions	−150
Minimum pages of SAM	32
Spool limits upper	1048
Spool limits lower	200
Background priority	30
Time slice quantum	300
Time slice priority	50
Number of shared programs	30
Words system memory block	0
Number of concurrent users	1
Words blank system common	1024

Libraries searched by LINK:

$BIGLB.LIB
HPCRT.LIB

C

Software Media (Rev. 6000)

Available Software Media

The Primary System, when ordered as part of a system product or when ordered stand-alone, is available on the following three types of media:

Option AAH	SCSI DDS Tape
Option 022	CS/80 Cartridge Tape
Option 061	1600 bpi Magnetic Tape

The Primary System is shipped on three tapes for each media option listed above. The three tapes are the BOOTABLE tape, the PRIMARY tape, and the RELOCATABLES tape. Table C-1 lists the tapes supplied with each media type.

The contents of the BOOTABLE tape for each media type are listed in the first file of that tape. This file is a bootable system whose only purpose is to list the name and sequence number of bootable files on the tape. To list this information file, enter one of the following bootstrings:

`VCP> %bdc2127`	for CS/80 Cartridge Tape Drive
`VCP> %bdc1027`	for HP 9144/45 Cartridge Tape Drive
`VCP> %bmt13027`	for SCSI DAT or HP 7980S Magnetic Tape Drive
`VCP> %bmt14027`	for HP 7970 Magnetic Tape Drive
`VCP> %bmt13027`	for HP 7974/7978 Magnetic Tape Drive

A menu similar to the following (for the Primary that includes diagnostics) will appear on the screen:

```
FILE NAME        FILE NO.  |  FILE NAME         FILE NO.
---------        --------  |  ---------         --------
!RESTORE              #    |  MTEXR                #
24612A                #    |  LANMEM               #
EXRTP(EXER&TAPE)      #    |  !VSCSI               #
OPER                  #    |  !FORMC               #
MTVER                 #
```

where # is the file number for that bootable file.

The following menu will appear for the *Primary only* BOOTABLE tape:

```
FILE NAME       FILE NO.  | FILE NAME       FILE NO.
---------       --------  | ---------       --------
!RESTORE              #   | !FORMC                #
!VSCSI                #   |
```

where # is the file number for that bootable file.

Table C-1. Software Media Part Numbers

Media Type	Product *	Part Number	Label	Contents
SCSI DDS Tape	Primary System with Diagnostics	24998-13614 24998-13613 92077-13605	BOOTABLE PRIMARY RELOCATABLES	!RESTORE, !VSCSI, !FORMC, Diags. Primary System and Diagnostics RTE-A Relocatable Files
	Primary System only	92077-13601 92077-13603 92077-13605	BOOTABLE PRIMARY RELOCATABLES	!RESTORE, !VSCSI, !FORMC Primary System RTE-A Relocatable Files
CS/80 Cart. Tape	Primary System with Diagnostics	24998-13328 24998-13327 92077-13312	BOOTABLE PRIMARY RELOCATABLES	!RESTORE, !VSCSI, !FORMC, Diags. Primary System and Diagnostics RTE-A Relocatable Files
	Primary System only	92077-13305 92077-13311 92077-13312	BOOTABLE PRIMARY RELOCATABLES	!RESTORE, !VSCSI, !FORMC Primary System RTE-A Relocatable Files
1600 bpi Mag. Tape	Primary System with Diagnostics	24998-13540 24998-13539 92077-13512	BOOTABLE PRIMARY RELOCATABLES	!RESTORE, !VSCSI, !FORMC, Diags. Primary System and Diagnostics RTE-A Relocatable Files
	Primary System only	92077-13520 92077-13519 92077-13512	BOOTABLE PRIMARY RELOCATABLES	!RESTORE, !VSCSI, !FORMC Primary System RTE-A Relocatable Files

* The RTE-A Primary, when ordered with a system product (for example an HP 2484A, HP 2999A, etc.) includes the HP 24612B diagnostics. When the RTE-A product is ordered stand-alone as product HP 92077A, the diagnostics are not included.

Diagnostics Shipped with the Primary

The HP 24612B, which consists of the HP 24612A CPU diagnostics and the HP 24398B Peripheral diagnostic products combined, are shipped with the system version of the RTE-A Primary (refer to Table C-1). The diagnostics reside on both the BOOTABLE tape and the PRIMARY tape. Therefore, you may either boot them directly from the BOOTABLE tape or you may boot them from your system disk after the PRIMARY tape has been restored to disk using !RESTORE. (Refer to Chapter 2 for the installation process using !RESTORE.)

For more information on the individual programs that make up the diagnostic product and for running the diagnostics, refer to the *Introduction to the A-Series Computer Diagnostics Manual,* part number 24612-90010, and the *A-Series Diagnostic Operating and Troubleshooting Manual,* part number 24612-90013.

The following subsections describe how to boot the diagnostics from the BOOTABLE tape or from the hard disk after the PRIMARY tape has been restored.

Booting the Diagnostics from Tape

The HP 24612A CPU diagnostics reside as one bootable file on the BOOTABLE tape. Once this file has been booted, you may run individual diagnostic programs. The diagnostic programs of the HP 24398B Peripheral diagnostics, however, reside on the BOOTABLE tape as individual bootable files. To boot the CPU diagnostics or one of the diagnostic programs of the peripheral diagnostics, first list the information file at the beginning of the tape by entering one of the following bootstrings:

`VCP> %bdc2127`	for CS/80 Cartridge Tape Drive
`VCP> %bdc1027`	for HP 9144/45 Cartridge Tape Drive
`VCP> %bmt13027`	for SCSI DAT or HP 7980S Magnetic Tape Drive
`VCP> %bmt14027`	for HP 7970 Magnetic Tape Drive
`VCP> %bmt13027`	for HP 7974/7978 Magnetic Tape Drive

The following menu will appear on the screen:

```
FILE NAME        FILE NO.  |  FILE NAME         FILE NO.
---------        --------  |  ---------         --------
!RESTORE               #   |  MTEXR                  #
24612A                 #   |  LANMEM                 #
EXRTP(EXER&TAPE)       #   |  !VSCSI                 #
OPER                   #   |  !FORMC                 #
MTVER                  #
```

where # is the file number for that bootable file.

Next, press the BREAK key to get the VCP prompt and re-enter the bootstring using the file number given in the menu above. The file number is inserted into the bootstring directly *after* the 'bdc' or 'bmt'.

For example, to boot file number 37 from CS/80 tape or file number 7 from DDS or magnetic tape, you would enter one of the following bootstrings:

`VCP> %bdc372127`	for CS/80 Cartridge Tape Drive
`VCP> %bmt73027`	for SCSI DAT or HP 7980S Magnetic Tape Drive

Booting the Diagnostics from Hard Disk

During the Primary installation process (described in Chapter 2 of this manual), the diagnostics are restored to your system disk and can be booted from disk as described below.

CPU Diagnostics

The individual files of the CPU diagnostics are restored to directory /DIAGS. (You cannot run these files from this directory, but you can access them in this form so that you may create your own custom diagnostics. Refer to the *A-Series Diagnostic Operating and Troubleshooting Manual,* part number 24612-90013, for more details.) !RESTORE (the Primary installation utility) installs these diagnostics into the reserved area of the CI volume. Creating this reserved area is a user option during the Primary installation procedure. The HP 24612A diagnostics can then be booted from this reserved area.

Boot the diagnostics from your system disk using one of the following bootstrings:

`VCP> %bdc62027<`*filename*`>`	for HP-IB hard disk
`VCP> %bdc66027<`*filename*`>`	for SCSI hard disk
`VCP> %bdc65027<`*filename*`>`	for SCSI Magneto Optical Disk

Refer to the *A-Series Diagnostic Operating and Troubleshooting Manual* for *<filename>* options to run the diagnostics.

Peripheral Diagnostics

The peripheral diagnostics are restored to directory /BOOTABLES as individual memory-based programs during the Primary installation process. Each memory-based program can then be booted by including the "/BOOTABLE" directory in the bootstring.

Boot the diagnostics from your system disk using one of the following bootstrings:

`VCP> %bdc2027/bootable/<`*filename*`>`	for HP-IB hard disk
`VCP> %bdc5027/bootable/<`*filename*`>`	for SCSI Magneto Optical Disk
`VCP> %bdc6027/bootable/<`*filename*`>`	for SCSI hard disk

where *<filename>* is one of the following diagnostic programs or bootable utilities:

EXRTP	LANMEM	MTVER	!FORMC
OPER	MTEXR	!RESTORE	!VSCSI

D

Restoring Files from Magnetic Media

This appendix gives procedures for restoring files from your media. The procedures vary depending on the type and format of your media.

Look at the label on your media to determine which format was used. Then find the section in this appendix which corresponds to the format of your media (sections are organized by format). Follow the instructions in that section to restore the files to your hard disk.

Also included in this appendix is a section on restoring files from Value Pack tapes.

The HPHPHP File

On the media with files to be restored to hard disk there is a file called HPHPHP which describes each of the software parts. Information provided for each part includes:

- Part number
- Software revision code
- Module number
- File type
- File name

All media (for example each tape or floppy) with a revision code of 2340 or greater will have an HPHPHP file and a transfer file for getting the files off the media. The exceptions are diagnostics and the Primary tape. The primary floppy will have a transfer file but not an HPHPHP file.

The information in HPHPHP is helpful if you want to know what files are on the medium. For example, if the medium is missing a software module that was listed in HPHPHP, you should call your support office and request the missing software.

HPHPHP is the first file on each tape. On floppies, HPHPHP, which has no part number, appears first in the directory listing. Diagnostics do not require an HPHPHP file.

FST Format for DDS, CS/80 Cartridge, and Magnetic Tape

Refer to the *RTE-A Utilities Manual*, part no. 92077-90004, for information on the FST utility.

A tape cartridge contains one or more products, each product being identified by a global directory. The HPHPHP file contains a list of all files on that tape. The following is an example on how to use FST:

```
CI> fst
FST> mt,lu
FST> v
FST> re,/global1/,/global2/
FST> go
```

where:

lu	is the LU of the tape.
/global1	is the global directory identifying the files for a given product on the tape.
/global2	is the global directory on your system.
v	specifies the verify option.

This will copy all the files from the tape with global directory */global1* onto the disk on directory */global2* and will verify each transfer. If the directory names are the same, both parameters to the 're' command can be omitted. Files with duplicate names will not be copied and duplicate file errors will occur. To replace duplicate files, use the 'D' option.

You could use the following:

```
CI> fst
FST> mt,lu
FST> v
FST> re
FST> go
```

This would copy all files from the tape LU to your disk under the directory names that the files are stored on the tape.

TF Format for CS/80 Cartridge and Magnetic Tape

Refer to the *RTE-A Utilities Manual*, part no. 92077-90004, for information on the TF utility.

A tape cartridge contains one or more products, each product being identified by a global directory. The HPHPHP file contains a list of all files on that tape. The following is an example on how to use TF:

```
CI> tf
TF: co,lu{/global1/@},/global2/@,v
```

where:

lu is the LU of the tape.

global1 is the global directory identifying the files for a given product on the tape.

global2 is the global directory on your system.

v specifies the verify option.

This will copy all the files from the tape with global directory */global1* onto the disk on directory */global2* and will verify each transfer. If the directory names are the same, the second parameter can be just "@". Files with duplicate names will not be copied and duplicate file errors will occur. To replace duplicate files, use the 'D' option.

You could use the following:

```
CI> tf
TF: co,lu,,v
```

This would copy all files from the tape LU to your disk under the directory names that the files are stored on the tape.

VCP Bootable Format for CS/80 CTD

VCP Bootable means that these files are loaded directly from tape into memory, then executed by following the instructions in the appropriate diagnostic manual. The CTD media update in this format replaces the older version of the media. Refer to the appropriate diagnostic manual.

CI CO Format for Magnetic Tape

To restore files from tapes in CI COpy format, use the following procedure:

1. You can either copy the first file from the media or skip the first file.

   Use the following command to copy the first file from your media LU, giving it the name HPHPHP:

   ```
   CI> co lu hphphp
   ```

   Use the following command to skip the first file on your media:

   ```
   CI> cn lu ff
   ```

2. Copy the transfer file from the media to hard disk.

   ```
   CI> co lu transfile
   ```

3. List and review the transfer file to check all the values needed for the global variables used in the next step.

   ```
   CI> li transfile
   ```

4. Transfer control to the transfer file to restore the remaining files to the hard disk.

   ```
   CI> tr transfile $1 $2 $3 $4
   ```

   where:

   $1 is the LU of your media.

   $2 is the new file system LU to create the global directory used in conjunction with CRDIR command.

   $3 is destination CRN (if files are to be restored on FMGR CRNs rather than a CI volume).

   $4 is security code (if files are to be restored on FMGR CRNs rather than a CI volume).

Floppies in FMGR Format

1. Insert the floppy containing the software into the drive and mount the drive.

   : *mc,−<lu>*

   where <lu> is the LU number of your flexible disk drive.

2. List the transfer file FLPRST.

   : *li,flprst*

   Note the use of the four global parameters in FLPRST. Global parameters 1G (source LU) and 2G (destination LU) are required. Global parameters 3G (security code) and 4G (PURGE existing files of the same name) are optional.

3. Transfer control to file FLPRST.

   : *tr,flprst,−<sourcelu>,<destlu>,[,sc,PURGE]*

   <sourcelu> is the LU number of the source LU, and <destlu> is the number of the destination LU. If you want the files being copied to <destlu> to have a security code, specify a value for optional parameter SC. If you want a file on the floppy to overwrite a file by the same name that already exists on <destlu>, include the word PURGE for the optional fourth parameter. (Note that the brackets indicate optional parameters and should not be entered as part of the command.)

   If a duplicate file exists on <destlu> and the purge option was not used, you will get a FMGR 002 error. For example, file HPHPHP exists on all floppies. If you want to avoid this error, use the purge option. Otherwise, when you get the error, enter:

   : *tr*

   This will continue execution of the transfer file but will not replace the HPHPHP file on <destlu>.

4. Dismount the drive.

   : *dc,−<lu>*

5. Repeat steps 1 through 4 for all floppies containing the software you are installing.

If you have CI on your system, you could optionally do the following:

1. Mount the drive while in FMGR.

   CI> *fmgr*
   : *mc,−<lu>*
   : *ex*

2. Copy the software to your CI volume. Note that you should use the 'D' option in the CO command if you are replacing files.

   CI> *co @::−<lu> @::−<destlu>*

   where <lu> is the LU of the drive and <destlu> is your CI volume.

Floppies in CI Format

On CI formatted floppies, /F/RESTORE_FLOPPY, a CI transfer file, will restore the software to the hard disk. In addition, almost all CI formatted floppies have /F as the only global directory. Therefore, if you are expecting to be sent /PASCAL/PASCAL.LIB, you will instead be sent file /F/PASCAL/PASCAL.LIB. All directories are subordinated to /F to allow the CI transfer file, RESTORE_FLOPPY to put files in the correct directory without having a duplicate directory error. Note, however, that files on the hard disk will not have the /F global directory.

Restore software from a CI formatted floppy using the following procedure:

1. Make sure the directory /F does not already exist on any CI mounted volume. Verify this by entering:

   CI> *dl /*

   If a /F directory exists, rename the directory. The floppy has a /F global directory and if a /F directory already exists and is mounted before the user mounts a new floppy, CI will issue the following message and the contents of the floppy will be inaccessible:

   Duplicate Directory /F

2. Insert the floppy containing the software into the drive and mount the drive.

   CI> *mc <lu>*

3. List file RESTORE_FLOPPY.

   CI> *li /f/restore_floppy*

   RESTORE_FLOPPY contains the commands to create directories and copy the software modules from the floppy to the hard disk.

   When listing the file, note the use of variable parameter $1. You will supply a value for this parameter when transferring control to RESTORE_FLOPPY.

   Also, note the file names used in the CO (copy) commands. When you transfer control to RESTORE_FLOPPY, a file being copied from the floppy will overwrite a file on the hard disk that has the same name and destination path. If you want to save the file currently residing on

the hard disk, either rename the file or copy the file to the removable media before transferring control to RESTORE_FLOPPY.

4. Transfer control to file RESTORE_FLOPPY.

   CI> *tr /f/restore_floppy <lu>*

   where <lu> at the end of the command indicates the LU to which the software should be copied.

   RESTORE_FLOPPY contains CRDIR (create directory) commands. When a CRDIR command is executed and the directory already exists, a duplicate directory error message is issued and execution of RESTORE_FLOPPY continues with the next command in the file. You can ignore the error message.

5. Dismount the drive.

   CI> *dc <lu>*

6. Repeat steps 2 through 5 until you have copied all files from the floppies.

   The rationale for the /F scheme is as follows: Suppose a floppy is sent without the /F directory and the top directory is called /PASCAL. Now the user wants to restore the floppy to disk. The destination directory cannot be called /PASCAL because only one /PASCAL can exist at one time. So, the user will have to call the destination directory something else. The /F scheme will prevent this problem.

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