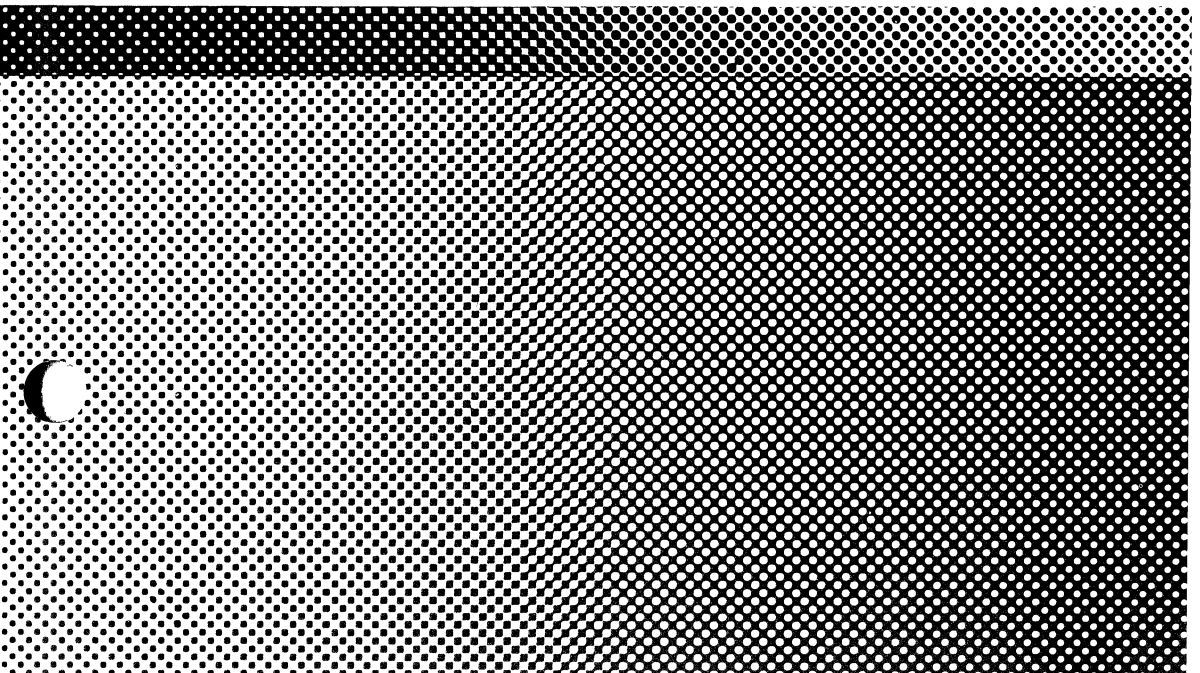




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Issue 1

AT&T 3B2 Computer
SCSI Release 3
Release Notes



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Preface

The Small Computer System Interface (SCSI) is an industry standard interface for connecting host computers and intelligent peripherals. AT&T 3B2 Computers support this interface. SCSI is the standard interface on Version 3 computers and can easily be added to Version 2 computers.

A wide variety of SCSI-based peripherals are already available for 3B2 computers. SCSI Release 3.0 introduces several new SCSI-based peripherals that enhance the line of available 3B2 SCSI products.

These *Release Notes* contain information about SCSI Release 3.0 products—information that supplements existing SCSI documentation. This document is intended for administrators, as well as users, of SCSI-based peripherals.

The first part of the *Release Notes* describes the new SCSI-based peripherals and the utilities that support the SCSI feature. The second part of the document identifies problems that you may encounter when using a SCSI device and suggested solutions to the problems.

SCSI-based products can be added to any Version 2 or Version 3 computer that is operating with UNIX® System V Release 2.0.5, Release 3.0, or a later release. (Version 2 computers are the 3B2/300, 3B2/310, and 3B2/400; Version 3 computers are the 3B2/500, 3B2/600, and 3B2/700.) Instructions for installing the SCSI feature and/or any SCSI-based peripheral are covered in the *AT&T 3B2 Computer SCSI Installation Manual*. Information on the administration and operation of the SCSI-based peripherals is found in the *AT&T 3B2 Computer SCSI Operations Manual*.

SCSI Release 3.0 Products

The following new products are being introduced in SCSI Release 3.0:

- A new Host Adapter with a differential SCSI bus interface
- A 300-megabyte disk drive with an embedded SCSI controller
- An auto-loading 6250-BPI 9-track tape drive
- A Peripheral Power Control Unit (PPCU).

Differential Host Adapter

The new Host Adapter and the original Host Adapter offered in SCSI Releases 1.0 and 2.0 are very similar. They are both single-width cards and both have the same performance in terms of Host Adapter firmware overhead. The major difference between the two is the type of interface they provide. The original Host Adapter provides a single-ended interface; the new Host Adapter provides a differential interface. Some advantages of a differential bus are increased cable lengths (up to 25 meters), improved resistance to electrical noise, and faster data transfer rates (up to 4 megabytes per second).

Embedded SCSI Controller Disk Drive

The new disk drive being offered in SCSI Release 3.0 comes with an embedded SCSI controller thus eliminating the need for a physically separate bridge controller. There are two versions available: one with a single-ended interface and one with a differential interface. Both versions have a formatted capacity of 300 megabytes.

Auto-Load 9-Track Tape Drive

The auto-load 9-track tape drive is a moderately sized tape drive that can be set on a table or desk top. Auto-loading is a feature that allows you to insert a 9-track reel into the drive, and the drive automatically threads the tape onto the take-up reel and positions it at the beginning of the tape.

This tape drive is available with either a single-ended interface or a differential interface. It can operate in a 1600-BPI mode or a 6250-BPI mode. Backup capacity is 145 megabytes on a 2400-foot reel.

Peripheral Power Control Unit (PPCU)

The PPCU is a power control unit that is used in shared peripheral applications. It provides the power control signals for powering up peripherals that are shared by several computers. With a PPCU, one or more computers can be powered down and the shared peripheral will stay powered up.

Other SCSI Products

The following products introduced with earlier SCSI releases are still available and are fully compatible with SCSI Release 3.0:

- Single-ended Host Adapter card— A feature card that provides the 3B2 computer with a single-ended interface to the SCSI bus. It can be installed in all versions of 3B2 computers.
- DCM/4E—The Disk Controller Module bridges the SCSI interface presented by the Host Adapter and the Enhanced Small Disk Interface (ESDI) of the disk drives.
- DM/147E—An ESDI disk drive that provides 147 megabytes of storage.
- DM/300E—An ESDI disk drive that provides 300 megabytes of storage.
- XM/900S—This Expansion Module houses three 300-megabyte ESDI disk drives and a bridge controller.
- TM/60S—A cartridge tape drive that can store 60 megabytes of data on a removable cartridge tape.
- TM/120S—A larger capacity cartridge tape drive that can store up to 120 megabytes of data on a removable cartridge tape.
- 1600-BPI 9-Track Tape Drive—A 9-track tape drive capable of reading and writing 1600-BPI data density reel tapes. Tapes written on this tape drive can store up to 40 megabytes of data.

Conventions

Typesetting Conventions

The following typesetting conventions are followed when describing command names, command line formats, files, and directory names:

- Enter words that are in **bold** type exactly as they appear.
- Words in *italics* are variables; substitute the appropriate values. These values may be file names or data values.
- Screen displays and examples of source code are presented in `constant-width` font.
- Characters or words in square brackets, [], are optional. (Do not type the brackets.)

Naming Conventions for SCSI Device Files

The naming convention for non-SCSI device files has the following form:

`/dev/rdisk/c#d#s#`

where:

c# = Controller designator

d# = Device designator

s# = Section or partition on the device.

The device file name for SCSI devices is very similar; however, another designator is added, "**t#**." SCSI device files have the form:

`/dev/rdisk/c#t#d#s#`

The **t#** designator identifies the target controller for the SCSI device.

Conventions

The device file names for each SCSI-based peripheral are as follows:

SCSI Hard Disk Drives

The device file name for a SCSI hard disk has the following form:

`/dev/dsk/c#t#d#s#`

or

`/dev/rdisk/c#t#d#s#`

where:

c# = Slot number for Host Adapter

t# = Target controller SCSI ID

d# = Hard disk logical unit ID

s# = Partition number.

SCSI 9-Track Tape Drives

The device file name for a SCSI 9-Track Tape has the following form:

`/dev/mt/c#t#d0&n`

or

`/dev/rmt/c#t#d0&n`

where:

c# = Slot number for Host Adapter

t# = Target controller SCSI ID

d0 = Logical unit number

& = m, h (tape density, medium or high)

n = No rewind (optional).

SCSI Cartridge Tape Drives

The device file name for a SCSI Cartridge Tape has the following form:

/dev/rmt/c#t#d0s#n

where:

- c#** = Slot number for Host Adapter
- t#** = Target controller SCSI ID
- d0** = Logical unit number
- s#** = s0 for 60MB, s1 for 120MB
- n** = No rewind (optional).

Utilities Description

The complete SCSI software package consists of the five floppy disks listed below:

- AT&T 3B2 Extended Core Upgrade Utilities
- AT&T 3B2 SCSI Host Adapter Utilities Release 3.0
- AT&T 3B2 SCSI Disk Controller Utilities Release 3.0
- AT&T 3B2 SCSI Cartridge Tape Utilities Release 3.0
- AT&T 3B2 SCSI 9-Track Tape Utilities Release 3.0.

Version 3 computers are delivered with the capability of supporting SCSI devices. Version 2 computers (with the exception of some 3B2/400 computers) require the installation of a Host Adapter card, the Extended Core Upgrade Utilities, and the Host Adapter Utilities before they can support SCSI devices.

The other utilities in the SCSI software package are installed to support a particular SCSI-based peripheral. For example, if you add a SCSI Cartridge Tape Module, you need to install the SCSI Cartridge Tape Utilities. Each SCSI peripheral package contains the software utility package (or packages) required to support that peripheral.

The following paragraphs describe each of the utilities and also identify dependencies, that is, other utilities that must be installed before the package can be installed.

Extended Core Upgrade Utilities

The Extended Core Upgrade (ECU) Utilities add components to the UNIX operating system that are required to support SCSI-based peripherals. The major components of the ECU Utilities are self-configuration enhancements and enhanced system administration.

Self-configuration allows a user to install new hardware and software on a 3B2 computer without having to manually rebuild the UNIX operating system with the necessary device drivers. Self-configuration determines what type of hardware has been added in the Input/Output (I/O) slots and then generates a new "unix" that contains the appropriate device drivers required to interface the hardware to the UNIX operating system kernel.

Enhanced system administration makes the changes to the system administration menus that are required to support the new SCSI devices.

Dependencies: System Administration Utilities.

SCSI Host Adapter Utilities Release 3.0

The SCSI Host Adapter Utilities install a driver that creates and maintains a communication path between the UNIX system kernel and the 3B2 SCSI Host Adapter card.

Dependencies: Extended Core Upgrade Utilities (only on Version 2 computers).

SCSI Disk Controller Utilities Release 3.0

The SCSI Disk Controller Utilities are required when adding a Disk Controller Module or SCSI Expansion Module to the SCSI bus. This utility package provides the mechanism for communicating between the 3B2 computer and the specific Disk Controller Module or the SCSI Expansion Modules connected on the SCSI bus.

Dependencies: Host Adapter Utilities Release 3.0.

SCSI Cartridge Tape Utilities Release 3.0

The SCSI Cartridge Tape Utilities are required when adding a SCSI Cartridge Tape Module to the SCSI bus. This utility package provides the specific functions required by the SCSI Cartridge Tape and integrated SCSI controller. The SCSI Cartridge Tape Utilities provide the mechanism for communicating between the 3B2 computer and the specific SCSI Cartridge Tape Module.

Dependencies: Host Adapter Utilities Release 3.0.

SCSI 9-Track Tape Utilities Release 3.0

The SCSI 9-Track Tape Utilities are required when adding a SCSI 9-Track Tape Drive to the SCSI bus. This utility package provides the unique functions required by the tape drive and the integrated SCSI controller. The 9-Track Tape Utilities provide the mechanism for communications between the 3B2 computer and the specific 9-track tape drive connected on the SCSI bus.

Dependencies: Host Adapter Utilities Release 3.0.

Contents of SCSI Utilities

Extended Core Upgrade Utilities

The Extended Core Upgrade Utilities are on one floppy disk. The release of the UNIX operating system on your computer dictates which files will be installed from this floppy. If you are installing the utility package on a computer operating with Release 2.0.5 or 3.0, all the files listed below are installed. If you are installing the utility package on Release 3.1, the files marked with an asterisk (*) or a dagger (†) are installed. If you are installing the utility package on a release later than Release 3.1, only those files marked with a dagger (†) are installed.

```
/usr/sbin/selpattern
/usr/sbin/selectdevice
/usr/admin/menu/diskmgmt/harddisk/display
/usr/admin/menu/diskmgmt/harddisk/rmdisk
/etc/savepio
/etc/fltboot
```

```
/filledtd*
/etc/drvinstall*
/etc/edittbl*
/etc/fmthard*
/etc/format*
/etc/getmajor*
/etc/gettype*
/etc/hdefix*
/etc/mkboot*
/etc/prtconf*
/etc/prtvtoc*
/lib/lboot*
/lib/olboot*
/usr/bin/dsconfig*
/usr/include/sys/boothdr.h*
/usr/include/sys/edt.h*
/usr/include/sys/extbus.h*
/usr/include/sys/libxedt.h*
/usr/include/sys/vtoc.h*
```

`/usr/sbin/vmkfs*`
`/usr/options/ecu.name*`

`/boot/pdi_†`
`/etc/master.d/pdi_†`
`/usr/include/sys/pdi.h†`
`/usr/admin/menu/diskmgmt/harddisk/format†`
`/usr/admin/menu/diskmgmt/harddisk/format.d/disk†`
`/usr/admin/menu/filemgmt/backup.d/9track†`
`/usr/admin/menu/filemgmt/hsbackup†`
`/usr/admin/menu/filemgmt/hsbackup.d/9track†`
`/usr/admin/menu/filemgmt/hsbackup.d/disk†`
`/usr/admin/menu/filemgmt/hsrestore†`
`/usr/admin/menu/filemgmt/hsrestore.d/disk†`
`/usr/admin/menu/filemgmt/hsrestore.d/9track†`
`/usr/admin/menu/filemgmt/restore.d/9track†`
`/usr/admin/menu/filemgmt/store.d/9track†`
`/usr/admin/menu/tapemgmt/DESC†`
`/usr/admin/menu/tapemgmt/rmtape†`
`/usr/admin/menu/tapemgmt/rmtape.d/9track†`
`/usr/lib/scsi/labelfsname†`
`/usr/lib/scsi/selectscsi†`

SCSI Host Adapter Utilities Release 3.0

The SCSI Host Adapter Utilities are on one floppy disk. The files that are installed depend on the release of the UNIX operating system on the computer to which the utility package is being added. If you are installing the utility package on a computer operating with a release earlier than Release 3.2.1, that is, 2.0.5, 3.0, etc., the files listed below that are marked with an asterisk (*) are not installed. These files are only installed on computers operating with Release 3.2.1.

Other files that are conditionally installed are **/bin/cpio** and **/etc/volcopy**. The **/bin/cpio** file is not installed on Release 3.1 or later releases; **/etc/volcopy** is not installed on any releases later than Release 3.1.

- /bin/cpio**
- /boot/scsi**
- /boot/sh00**
- /dev/mt**
- /dev/rmt**
- /dev/scsi**
- /dgn/SCSI**
- /dgn/X.SCSI**
- /edt/SCSI/edtgen**
- /etc/init.d/lock***
- /etc/init.d/unlock***
- /etc/master.d/scsi**
- /etc/master.d/sh00**
- /etc/prtconf.d/scsi**
- /etc/scsi/edittbl**
- /etc/scsi/haversion**
- /etc/scsi/mkdev**
- /etc/scsi/mkdev.d/9track1**
- /etc/scsi/mkdev.d/disk1**
- /etc/scsi/mkdev.d/host1**
- /etc/scsi/mkdev.d/qtape1**
- /etc/scsi/rc.scsi**
- /etc/scsi/sbusclr***
- /etc/scsi/sdevlock***
- /etc/scsi/tc.index**

- `/etc/volcopy`
- `/lib/pump/scsi`
- `/lib/pump/scsi2`
- `/usr/admin/menu/diskmgmt/sharedmgmt/DESC*`
- `/usr/admin/menu/diskmgmt/sharedmgmt/lock*`
- `/usr/admin/menu/diskmgmt/sharedmgmt/lock.d/disk*`
- `/usr/admin/menu/diskmgmt/sharedmgmt/lockdisp*`
- `/usr/admin/menu/diskmgmt/sharedmgmt/reset*`
- `/usr/admin/menu/diskmgmt/sharedmgmt/reset.d/disk*`
- `/usr/admin/menu/diskmgmt/sharedmgmt/unlock*`
- `/usr/admin/menu/diskmgmt/sharedmgmt/unlock.d/disk*`
- `/usr/include/sys/scsi.h`
- `/usr/include/sys/scsi_edt.h`
- `/usr/include/sys/sdi.h`
- `/usr/lib/scsi/format`
- `/usr/lib/scsi/format.d/DISK`
- `/usr/lib/scsi/hdefix`
- `/usr/lib/scsi/sd00.0`
- `/usr/lib/scsi/tc.index`
- `/usr/options/scsi.name`

SCSI Disk Controller Utilities Release 3.0

The SCSI Disk Controller Utilities are on the same floppy disk as the SCSI Disk Mirroring Utilities. The files in the SCSI Disk Controller Utilities are listed below. Only one file is conditionally installed: `/etc/mountall`. This file is only installed on Releases 2.0.5, 3.0, or 3.1. All the other files are installed regardless of the release of the operating system.

- `/boot/sd01`
- `/etc/master.d/sd01`
- `/etc/mountall`
- `/usr/admin/menu/filemgmt/hsbackup.d/disk`
- `/usr/lib/scsi/scsivolcopy`
- `/usr/lib/scsi/sd01.1`
- `/usr/lib/scsi/sd01.2`
- `/usr/options/sd01.name`

SCSI Disk Mirroring Utilities Release 1.0

The SCSI Disk Mirroring Utilities are on the same floppy disk as the SCSI Disk Controller Utilities. These utilities can only be installed on computers operating with UNIX System Release 3.2 or a later release. The files in the Disk Mirroring Utilities are listed below:

- /boot/mirror**
- /etc/init.d/mirdisk**
- /etc/master.d/mirror**
- /etc/rc2.d/S80restore**
- /etc/scsi/mirlist**
- /etc/scsi/mirrestore**
- /etc/scsi/mirror**
- /etc/scsi/mverify**
- /etc/scsi/setmirror**
- /etc/scsi/umirror**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirverify**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/DESC**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirdisp**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirpartition**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirpartition.d/disk**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirremove**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirrestore**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirror**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirror.d/disk**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/mirsetup**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/rootremove**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/rootsetup**
- /usr/admin/menu/disk/mgmt/mirror/mgmt/unmirror**
- /usr/sbin/findparts**
- /usr/lib/scsi/findmir**
- /usr/options/mirror.name**

SCSI Cartridge Tape Utilities Release 3.0

The SCSI Cartridge Tape Utilities are on one floppy disk. The files installed from that floppy are listed below:

```
/boot/st01
/etc/master.d/st01
/etc/scsi/compress
/etc/scsi/compress.d/qtape
/etc/scsi/mkdev.d/qtape1
/etc/scsi/mkdev.d/qtape2
/usr/admin/menu/filemgmt/backup.d/qtape
/usr/admin/menu/filemgmt/hsbackup.d/qtape
/usr/admin/menu/filemgmt/hsrestore.d/qtape
/usr/admin/menu/filemgmt/restore.d/qtape
/usr/admin/menu/filemgmt/store.d/qtape
/usr/admin/menu/tapemgmt/DESC
/usr/admin/menu/tapemgmt/compress
/usr/admin/menu/tapemgmt/compress.d/qtape
/usr/admin/menu/tapemgmt/rmtape.d/qtape
/usr/include/sys/st01_ioctl.h
/usr/lib/scsi/scsivolcopy
/usr/lib/scsi/scsivolcopy.d/qtape
/usr/lib/scsi/tapecntl
/usr/lib/scsi/tapecntl.d/qtape
/usr/options/st01.name
```

Additional files may also be installed. The installation program checks for the following files:

```
/usr/admin/menu/filemgmt/hsrestore
/etc/finc
/etc/frec
```

If these files are already installed, the installed versions are compared with the versions included in this utility package. If this utility package contains newer versions, the installed files will be overwritten.

SCSI 9-Track Tape Utilities Release 3.0

The SCSI 9-Track Tape Utilities are on one floppy disk. The files installed from that floppy are listed below:

```
/boot/st00  
/etc/master.d/st00  
/etc/scsi/compress  
/etc/scsi/compress.d/9track  
/etc/scsi/mkdev.d/9track1  
/etc/scsi/mkdev.d/9track2  
/usr/admin/menu/filemgmt/backup.d/9track  
/usr/admin/menu/filemgmt/hsbackup.d/9track  
/usr/admin/menu/filemgmt/hsrestore.d/9track  
/usr/admin/menu/filemgmt/restore.d/9track  
/usr/admin/menu/filemgmt/store.d/9track  
/usr/admin/menu/softwaremgmt/installpkg.d/9track  
/usr/admin/menu/softwaremgmt/removepkg.d/9track  
/usr/admin/menu/tapemgmt/DESC  
/usr/admin/menu/tapemgmt/compress  
/usr/admin/menu/tapemgmt/compress.d/9track  
/usr/admin/menu/tapemgmt/rmtape.d/9track  
/usr/include/sys/st00_ioctl.h  
/usr/lib/scsi/scsivolcopy  
/usr/lib/scsi/scsivolcopy.d/9track  
/usr/lib/scsi/tapecntl  
/usr/lib/scsi/tapecntl.d/9track  
/usr/options/st00.name
```

Additional files may also be installed. The installation program checks for the following files:

```
/usr/admin/menu/filemgmt/hsrestore  
/etc/finc  
/etc/frec  
/etc/ff  
/etc/tar
```

If these files are already installed, the installed versions are compared with the versions included in this utility package. If this utility package contains newer versions, the installed files will be overwritten.

Using SCSI Tape Drives

Improving Performance When Copying Files to 9-Track Tape

The time required to copy files to a 9-track tape can be improved by using the following options with the **tar**, **cpio**, and **dd** commands:

- tar** — Use the "**b**" option and specify a raw device name.
- cpio** — Use the "**B**" option and specify a raw device name.
- dd** — Use the "**bs**" option, set the block size equal to 32 kilobytes and specify a raw device name.

Reading From a Raw Tape Device (**fread** and **read**)

Using the C library function *fread()* to read from a raw device may cause data errors.

The *fread()* library function uses a default block size of 1024 bytes. If *fread()* is used to read a raw I/O device which supports block sizes other than 1024 bytes (such as a 9-track tape written in 65536 byte blocks), *fread()* will not return the expected data. (This is a consequence of the way *fread()* buffers its data.)

The *setvbuf()* function is intended to be used to change the size of the buffer used by *fread()*. These functions, however, do not work correctly for raw devices, and their use may result in the loss of data. This can occur any time that the *setvbuf()* function is used.

To prevent the loss of data, use *read()* instead of *fread()* to recover data written to the raw device. The *fread()* function, with default buffering, may be used if the device being read was written in 1024-byte blocks. Do NOT use the *setvbuf()* function since this function can cause data loss.

Permission Bits on Tape Device Files

The permission bits on tape device files are set to 666 by default; that is, all users have read and write permission. To prevent an unauthorized user from writing to a tape left in or on a tape drive, make sure the write protection media is in place, or change the permission bits on the tape device file.

Access Mode for SCSI Tape Drives

SCSI Cartridge Tape Drives are only accessible in raw mode. Although 9-track tape drives can be accessed in either raw mode or block mode, it is recommended that they only be accessed in raw mode.

Using Multiple Tapes for Backups

The commands **sysadm backup** and **sysadm hbackup** (commands from the System Administration Menu) will span across multiple tapes. The **cpio** or the **volcopy** command will also span across multiple tapes if you specify a raw device, for example, **/dev/rmt/c1t7d0m**. The **find** and **tar** commands, however, do not span across multiple tapes.

Tape Drive Data Transfer Block Sizes

The maximum block size for transferring data to or from any SCSI Tape Drive is 64 kilobytes. Recommended block sizes are 64 kilobytes for cartridge tape drives and 32 kilobytes for 9-track tape drives.

Reading Different Density 9-Track Tapes

SCSI Release 3.0 offers a 9-track tape drive that allows you to write tapes at either medium density (1600 BPI) or high density (6250 BPI). Since tapes can be written at different densities, a feature of this tape drive is the ability to detect the density at which a tape was written and, if necessary, automatically change to the correct read mode. For example, if you write a tape at 1600 BPI and try to read it at 6250 BPI, the drive recognizes the disparity, makes the mode change, and reads the tape. This automatic mode selection, however, is only made when the tape is completely rewound and at the Beginning of Tape (BOT).

Attempts to read a tape that is not at BOT will fail if the correct density is not selected. For this reason, it is a good idea to label tapes after you write them so you know the density to select when you want to read a tape.

Electrostatic Discharge Problems With SCSI Cartridge Tapes

SCSI cartridge tape drives are more sensitive to electrostatic discharge (ESD) than other 3B2 computer storage devices, including cartridge tape controller (CTC) tape drives. Error messages, similar to the following two error messages, may result from ESD interference:

```
HA FW WARNING: Select failed for qtape
```

```
HA FW WARNING: Received a SCSI bus reset
```

The first message (`Select failed for qtape`) indicates that the cartridge tape target controller is no longer operating normally. To clear the problem, run SCSI diagnostic phase 17. This will reset the SCSI bus, forcing the controller back to a normal operating state.

The second message (`Received a SCSI bus reset`) informs you that the controller reset itself. After the reset, the controller may have regained operational status with the only impact being the failure of some qtape jobs. To see if the problem has been cleared, retry the failed qtape jobs.

Relative humidity outside the AT&T specified limits is a probable cause of ESD problems. Determine if the relative humidity in the computer environment is within limits (20% - 80%); if it is not, adjust the humidity.

Loading Tapes in Auto-Load 9-Track Tape Drive

After inserting a tape in an auto-load 9-track tape drive, do not attempt to access the tape drive until BOT appears on the display panel. Normal commands or attempts to access the tape drive while the tape is loading, that is, before BOT is located, will fail or be denied.

Multiple Save Set (MSS) Backups

If an MSS incremental backup or store operation is attempted to a non-MSS cartridge (any cartridge tape not written with MSS software), a message similar to the following is displayed:

**ERROR: Unable to read the tape in the qtapel drive.
Check the drive and tape before trying again.**

This message does not clearly define the problem and may lead you to think you have a cartridge tape drive or tape problem. To avoid using the wrong tape, get in the habit of labeling tapes after doing backups. Place a label on the tape that identifies it as a standard backup or an MSS backup.

Using SCSI Hard Disks

Formatting Remote Hard Disks

The optional Remote File Sharing package allows you to share files and directories with other computers on your network. Only those files that are "advertised," however, can be shared. If a SCSI raw disk device name is advertised, it is possible for a super user to invoke the **format** command to format a SCSI hard disk on a remote computer. Since no check is made to determine whether the remote device has a mounted file system, there is a possibility of losing data and a possible panic on the remote computer. To prevent this from happening, use only remote command execution to format remote hard disks.

Repartitioning More Than One Disk

When a SCSI device is added to the SCSI bus, system administration assigns a name to the device; for example, **disk1**, **qtape1**, or **9track1**. The *3B2 Computer SCSI Installation Manual* directs you to place the number that system administration assigns to the device on the front of the cabinet. If you have several hard disks and remove some of them for repartitioning, system administration may not assign the same names to the disks when the system is rebooted. Therefore, if you repartition more than one disk at a time, pay close attention to the names that system administration assigns. If the names were changed, be sure to change the system administration ID labels on the front of the cabinets. Also, add the new names to the Configuration Chart in the *3B2 Computer SCSI Installation Manual*.

Notes On Disk Mirroring

This section contains information that you need to be aware of when using the mirroring feature.

Keeping Track of Mirrored Partitions

The **sysadm display** command, on the **harddisk** submenu, shows the VTOC of the selected device. This includes the mounted file system names of any partitions containing valid file systems. When two partitions are mirrored, however, they can no longer be individually mounted; consequently, no mounted file system names show up for these partitions in the VTOC.

When executing **sysadm display**, do not be mistaken by what appears to be an empty partition. Use the **sysadm mirdisp** command to identify and keep track of mirrored partitions.

Formatting Hard Disks That Contain Mirrored Partitions

When you format a hard disk, the data on the disk will be lost. To prevent accidental data loss, the **sysadm format** command identifies the file systems that will be destroyed and gives you an opportunity to stop the formatting procedure. The **sysadm format** command, however, does not recognize or list mirrored file systems. This presents a problem if the mirrored file system happens to be root. Proceeding with the format will hang the system and it will have to be cleared by a hard reset. (No data loss should occur.) For this reason, do not execute **sysadm format** on ANY active root device! If you really need to format the root device, use the full restore procedure.

If you attempt to execute **sysadm format** on a nonroot disk device that contains one or more mirrored partitions, the command will fail with a message similar to the following:

```
ADMIN COMMAND ERROR:    Call Customer Service.  
menu/diskgmt/harddisk/format: Format failed for the disk.
```

If you get this type of error message, execute the **sysadm mirdisp** command to check for mirrored partitions. If there are mirrored partitions, the command failure is normal and there is no need to call "customer service." Before the disk device can be reformatted, the mirrored partitions must be unmirrored (**sysadm unmirror**). Note that if both halves of a mirrored pair of partitions are on the same disk device and the device is reformatted, the contents of that mirrored file system will be destroyed!

Removing Disks With Mirrored Root/Usr File Systems

When using **sysadm harddisk rmdisk**, it is possible to remove the device nodes of disks containing partitions that are mirroring the **root** and/or **/usr** file systems.

If **rmdisk** is used on disk(s) containing only one partition of mirrored pair(s) that support either **root** or **/usr** and the system is then rebooted, the system will come up properly with the mirror node(s) for **root** and/or **/usr** ACTIVE on the other partition(s) of the mirrored pair(s).

If **rmdisk** is used on disk(s) containing both partitions of mirrored pair(s) that support either **root** or **/usr** and the system is then rebooted, the system will come up with the mirror node for **root** ACTIVE on one of the partitions of its mirrored pair. The **/usr** file system, however, will not be mounted, and any scripts or packages needing access to it will fail.

To remove a hard disk that contains mirrored partitions, perform the following steps: 1) Mount the **/usr** file system if it is not mounted. 2) Execute **sysadm mirrorgmt rootremove** to unmirror the **root**, **/usr**, and/or **swap** partitions. 3) Execute **sysadm harddisk rmdisk**. 4) Reboot the system.

Mirroring and Remote File Sharing

Remote File Sharing (RFS) allows different computers (host computers) to share devices across a network. Although it is not recommended (for performance reasons) it is possible for one host computer to mirror remote device nodes on another host computer.

If you do try to use mirroring on remote devices, you need to be aware that the mirror table information will not be complete on both host computers. For example, if Host A mirrors remote device nodes of Host B, the mirrored relationship shows up in the mirror table on Host A but not on Host B, where the mirrored relationship actually exists. This presents no problem to Host A, but may cause confusion on Host B when disk partitions that appear to be accessible are not because of their hidden mirrored activity.

The solution to this problem is to execute the **setmirror(1M)** command on all involved host computers. This will refresh the mirror table information on each host computer.

Software Notes

This section contains information that you need to be aware of when using certain commands with a SCSI-based peripheral. The commands are arranged in alphabetical order.

cpio Command

Accessing a 9-track tape with the **cpio** command is much more efficient in the raw mode. You can use the block mode, but the copy may fail; especially if you are using the default block size and the high density option 6250 BPI. Using the default block size and the high density option causes an excessive amount of tape repositioning that often results in media errors. If you must use the block mode, using the **-B** option (large block option) will improve performance and prevent errors from occurring.

finc Command

An attempt to back up data to a tape device, using the **finc** command, may intermittently fail. The following is an example of the error message that is displayed:

```
/etc/finc: /dev/rdisk/c1t1d0s2 -> /dev/rmt/c1t2d0s0: i/o failed.  
block: 795029810 err=Invalid Argument
```

The chances of the **finc** command failing are greater if the system is very busy. If the attempt fails the first time, try again.

sysadm restore Command

File modification times are not retained when you use **sysadm restore**; all the times are reset. This will cause problems with data that needs to be restored with the original modification times, for example, SCCS files.

If you have files that need to retain their modification times, do not use **sysadm backup** or **restore**. Use administrative commands such as **cpio(1)** (with the **"-m"** option) for these files.

tar Command

In order for the **tar** command to execute properly, the options and arguments must be in a particular order. The proper order is:

```
tar [-]{txruc}[vwfblm][0-7[lmh]][tapefile][blocksize] file1 file2
```

Note: The "u" and "r" options are not functional.

The **tar** command does not work across multiple tapes.

volcopy Command

-buf Option

Because of the multiple processes involved in writing to or reading from a tape when double buffering is used, tapes written using the "**-buf**" option (**volcopy -buf**) can only be read with the "**-buf**" option.

-reel Option

The **volcopy -reel** option does not work. If an error occurs while reading a tape, the command sequence must be restarted beginning with the first tape.

Miscellaneous

Labeling File Systems on Remote Computers

The **labelit** command is used to provide initial labels for unmounted file systems. **labelit** checks for an argument beginning with **/dev**. If the advertised resource you are trying to label is in a directory that does not begin with **/dev**, the **labelit** command will fail.

Use remote command execution to label the media on the remote computer.

Note: This is no longer a problem in Release 3.2 or Release 3.2.1.

Assigning File System Names

When you mount a file system, the mount directory path name is truncated to 14 characters, which is the maximum number of characters that **sysadm backup** recognizes. If the mount directory path name exceeds 14 characters, **sysadm backup** will not be able to access the file system. To insure that **sysadm backup** can access your file systems, use short path names when defining mount directories.

SCSI Tape Utilities and Cartridge Tape (CTC) Utilities

The following information is important to you if you plan to have the SCSI Tape Utilities (SCSI Cartridge Tape Utilities or SCSI 9-Track Tape Utilities) and the Cartridge Tape (CTC) Utilities installed at the same time.

- The SCSI Tape Utilities and the CTC Utilities have several commands in common.
- If either of the SCSI Tape Utilities is installed and you subsequently install the CTC Utilities, the common commands are overwritten with older versions of the commands.

- Always reinstall the SCSI Tape Utilities after installing the CTC Utilities.

Error Messages From Shared Peripherals

When using device locking arrangements in a shared peripheral environment, there are many user and administrative commands that may fail when they encounter a SCSI device that is locked to a different host. Different commands may display different error messages. These error messages may not explicitly identify the problem because the device is locked to a different host.

If you are confronted with an error message for a device on a shared SCSI bus, use the **sdevlock** command to determine the status of all locked devices on the bus. Retry the failed command when the resource is unlocked or locked to the local host.

Documentation

The following documents also support SCSI products:

- *AT&T 3B2 Computer SCSI Installation Manual (305-011)*
- *AT&T 3B2 Computer SCSI Operations Manual (305-012).*

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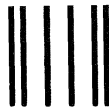
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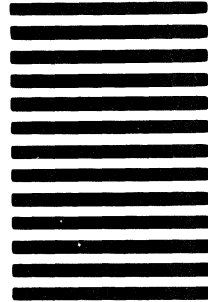
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