

**Software
Installation
Guide**

**CADDStation
SYSTEMS**



CADDStation Systems Software Installation Guide

UNIX 4.2 bsd Revision 5.3

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CADDStation
Systems Software
Installation Guide

Contents

Software Installation Guide

Installing and Using the License Management System

The *CADDStation Systems Software Installation Guide* describes how to load system software and applications onto a CADDStation System. This guide is for those responsible for loading system software and applications: system managers, application programmers, and engineers.

This guide describes the installation of

- License Management System
- UNIX operating system
- CADDs and CADDs applications
- Electronics applications and other applications

This manual supports CADDStation Systems Revision 4.0 running UNIX 4.2 bsd Revision 5.3 and subsequent releases. Hardware and software enhancements may make some of this information obsolete. See *Introducing CADDStation Revision 4.0* for further information.

For information on training, ordering publications, reporting software problems, and other product-related issues, consult your Computervision representative.

How to Use the CADDStation Systems Software Installation Guide

Other Useful Books

The chart on the next page shows the entire CADDStation Systems document set and the relationship of documents in the set. In addition to the two books in this binder, to completely install and set up software, you also need the following books:

- *Introducing CADDStation Revision 4.0* may contain last-minute information that you need to install software.

You must review this book to see if there is information relevant to your site. This book uses the generic phrase *release bulletin* to refer to *Introducing CADDStation Revision 4.0*.

- The *CADDStation Systems Manager Guide: Managing the CADDStation System* shows you how to add users and terminals, set up printers and peripherals, and manage day-to-day aspects of the system.

CADDStation Systems Overview describes all models of CADDStation systems. You need to know the model names of your systems. This book also shows how to load a 1/2-inch tape on a server.

Using the UNIX Operating System contains tutorials for basic UNIX commands, including the vi editor.

- The *CADDStation Systems Network Guide: Setting Up and Managing the Network* tells you how to set up mail and uucp.
- This book uses the generic phrase *UNIX command reference* to refer to Sun Microsystems' *Commands Reference Manual* (distributed by Computervision), which documents all UNIX commands.

How to Use the CADDStation Systems Software Installation Guide

The *CADDStation Systems Software Installation Guide* contains all information necessary for installing a CADDStation system.

How This Binder Is Organized

This binder consists of two books:

- *CADDStation Systems Software Installation Guide*

This book tells you how to load operating system and application software on a CADDStation system.

- *Installing and Using the License Management System*

This book tells you how to install and use the License Management System (LMS). The LMS is a utility that controls the number and use of licenses for all Computervision software.

Before loading applications, you must have installed the License Manager.

Previous Training

Before loading UNIX, your systems and your network must be installed by Computervision Field Service.

This guide assumes that you know how to use the vi editor. Information on the vi editor (and other UNIX commands used in this book) is found in *Using the UNIX Operating System* in the *CADDStation Systems Manager Guide*. The *CADDStation vi Editor Quick Reference Card* in the *CADDStation Systems User Guide* may also be useful.

You should also acquaint yourself with Sun Microsystems' *Commands Reference Manual*, which describes UNIX commands. More information on all commands used in this book can be found there.

If you are installing a CADDServer, you must be familiar with how to load a tape on your server. This information can be found in *Managing the CADDStation System* in the *CADDStation Systems Manager Guide*.

CADDStation Systems Documentation Set 4.0

Binder names are in bold type

One per Workstation for Applications Users:

CADDStation Systems User Guide

Using the CADDStation
Working with Windows
CADDStation Glossary

Pocket Guides:
CADDStation User Interface
Using Electronic Mail
CADDStation UNIX Commands
CADDStation vi Editor Quick Reference Card

One per System for System Managers:

Introducing CADDStation Revision 4.0

CADDStation Systems Software Installation Guide

CADDStation Systems Software Installation Guide
Installing and Using the License Management System

CADDStation Systems Manager Guide Volume 1

CADDStation Systems Overview
Managing the CADDStation System
Interpreting System Messages

Pocket Guide:
Administering the CADDStation System

CADDStation Systems Manager Guide Volume 2

Using the UNIX Operating System

Pocket Guide:
System Manager Commands

CADDStation Systems Network Guide

Setting Up and Managing the Network
Using the Network
Transferring Data via 2780/3780 Protocols (optional)
Installing and Using CADDStation Connect Interface (optional)
Using the Remote Data Transfer Facility (optional)

Pocket Guide:
Electronic Mail Commands

Additional books, one per System:
UNIX Editors User Guide
Formatting Documents on the Sun Workstation
Using nroff and troff on the Sun Workstation

Optional Documentation Sets According to Product

**CADDStation
Documentation Set**

**Engineering Development
Documentation Set (optional)**
Programming Documents
CV Enhancements
Windows and Window-Based Tools:
Beginner's Guide

**Applications
Documentation Sets**

How to Use the CADDStation Systems Software Installation Guide

Special Typographical Conventions

boldface	Boldface defines exactly what you must enter on your keyboard. It is also used in text to distinguish UNIX file and directory names, commands, and options.
typewriter font	Typewriter font indicates computer output or lines of code.
<i>italics</i>	Italics indicate a word requiring an appropriate substitution (e.g., Replace <i>filename</i> with a real file name). Italics in computer display (screen) examples distinguish comments.
CAPITALS	Capital letters identify keyboard keys (e.g., Press RETURN).
keyword(n)	Many UNIX keywords are followed by a UNIX reference number enclosed in parentheses (the number refers to a UNIX command group); the UNIX command reference contains groups (1), (5), (7), and (8) commands.
#	The pound sign is the UNIX root (superuser) prompt.
%	The percent sign is the UNIX C Shell prompt (often preceded by a sample system name).
\$	The dollar sign is the UNIX Bourne Shell prompt.
[]	In command syntax, square brackets enclose optional input.
{ }	In command syntax, braces enclose several items, separated by commas, from which you must choose only one.

Document History

The following lists important changes that have been made to these books.

CADDStation Revision 4.0

Change	Description
<i>Installing and Using the License Management System</i>	This book has been expanded from a pocket guide to a book. LMS automatically returns all implicitly transferred licenses, described in Section 4.
<i>CADDStation Systems Software Installation Guide</i>	Information on Installing PDM Client added. Section 5 was retitled to Reconfiguring the UNIX Kernel. Information formerly in Section 5 on Preparing for Applications was moved to other locations. prepdisk is enhanced to include a second disk controller. Appendix I, Increasing swap with the prepdisk Utility, was added.

CADDStation Revision 3.3

Change	Description
<i>Installing and Using the License Management System</i>	This is a new pocket guide.
<i>CADDStation Systems Software Installation Guide</i>	Information updated to include information on the License Management System, the new loadappl command, and changes to installation software programs.

CADDStation Revision 3.1

Change	Description
<i>CADDStation Systems Software Installation Guide</i>	setup forms have been added for stand-alone and server configurations.

Document History

CADDStation Revision 3.0

Change	Description
<i>CADDStation Systems Software Installation Guide</i>	<p>The installation procedures for installing system software, CADDStation, and other applications is now described as a single step-by-step process. The instructions point out variations for different configurations.</p> <p>The prepdisk utility replaces diag as the means of initializing and formatting your disk.</p> <p>The worksheet utility automatically calculates the sizes of partitions for system partition maps.</p>

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The *CADDStation Systems Software Installation Guide* describes how to install

- UNIX operating system
- CADDs and CADDs applications
- Electronic applications
- PDM Client software

Section 1 through 7 describe procedures to install CADDStation software. Carefully read all planning information. You need only follow the procedures for the type of system you are installing. Double-check to ensure you are following all procedures that apply to your system. Sections are

- Section 1—Preparing to Install Software
- Section 2—Initializing Disks—**prepdisk** Utility
- Section 3—Determining Required Disk Space—**worksheet** Utility
- Section 4—Configuring and Loading the System—**setup** Utility
- Section 5—Reconfiguring the UNIX kernel
- Section 6—Installing CADDs
- Section 7—Installing Applications

Appendixes A through I contain reference material and procedures that you rarely need. They include

- Appendix A—Manual Mode of the **prepdisk** utility
- Appendix B—Upgrading UNIX
- Appendix C—Summary of Software Package Loading Methods
- Appendix D—Messages from the Boot Procedure
- Appendix E—Handling System-reported Disk Flaws and Formatting Disks
- Appendix F—Background Information About Disk Configuration
- Appendix G—Using the Terminal Interface to **setup**
- Appendix H—Creating a Diskful NFS Client
- Appendix I—Increasing swap with the **prepdisk** Utility

Preparing to Install Software

This section contains instructions on how to plan your software installation and beginning software installation procedures. Specifically, it contains

- A description of which systems need installed License Managers
- An estimate of the time required for installation
- Ways to correct errors
- Summaries of steps to load UNIX and CADDSS
- A list of files on the UNIX tapes
- Procedures to prepare a tapeful remote host to load a tapeless system
- Procedures to halt your systems prior to beginning the installation

Hardware Installation

If you are loading a new system, Computervision Field Service installs your system hardware for you.

Installing the License Manager

With CADDStation Revision 3.3 (and later revisions), the License Management System (LMS) enables application license sharing among systems. The License Management System consists of hardware and software. The License Manager is the hardware part of the LMS.

Any system that runs an application locally needs a License Manager. You must install the License Manager before you load the local application software. For a list of applications that run locally and for instructions for installing the License Manager, see the *Installing and Using the License Management System*.

Estimating Time Required

Installing UNIX on a new system takes 1 to 2 hours, depending on the amount of optional software selected. Installing CADDSS takes 2 to 3 additional hours.

System Terminology

This book describes procedures that are usable on different system configurations. Terms that are used to differentiate types of systems are defined below. These terms can be grouped to refer to specific configurations, such as a *diskful tapeless client* or a *stand-alone NFS client*.

Diskful	A system that has its own storage disks. The disks may be used to run operating system or application software or to store parts.
Diskless	A system that does not have its own storage disks. It must be configured as a client on a server.
Tapeful	A system that has its own tape drive.
Tapeless	A system that does not have its own tape drive. It relies on a remote system's tape drive for taping needs.
Stand-alone	A CADDServer or a workstation that has its own tape and its own disk(s) and does not serve clients. Note that either a CADDServer or a workstation can be a stand-alone.
Server	A CADDServer or a workstation that has its own disk(s) and is configured to serve clients. Note that either a CADDServer or a workstation can be a server and serve clients.
Client	This system is configured as a client on a server. It depends on the server for its software. It can be tapeful or tapeless and diskful or diskless. A diskful client may use its own disks for application software or for parts storage.
NFS server	A CADDServer or a workstation that allows a remote system to access its software through NFS mounts. The remote system is called an NFS client.
NFS client	A system that accesses software from an NFS server through NFS mounts. It is not configured as a client to that server. A system could, however, be an NFS client of one system and a standard client of another server.

Preparing to Install Software

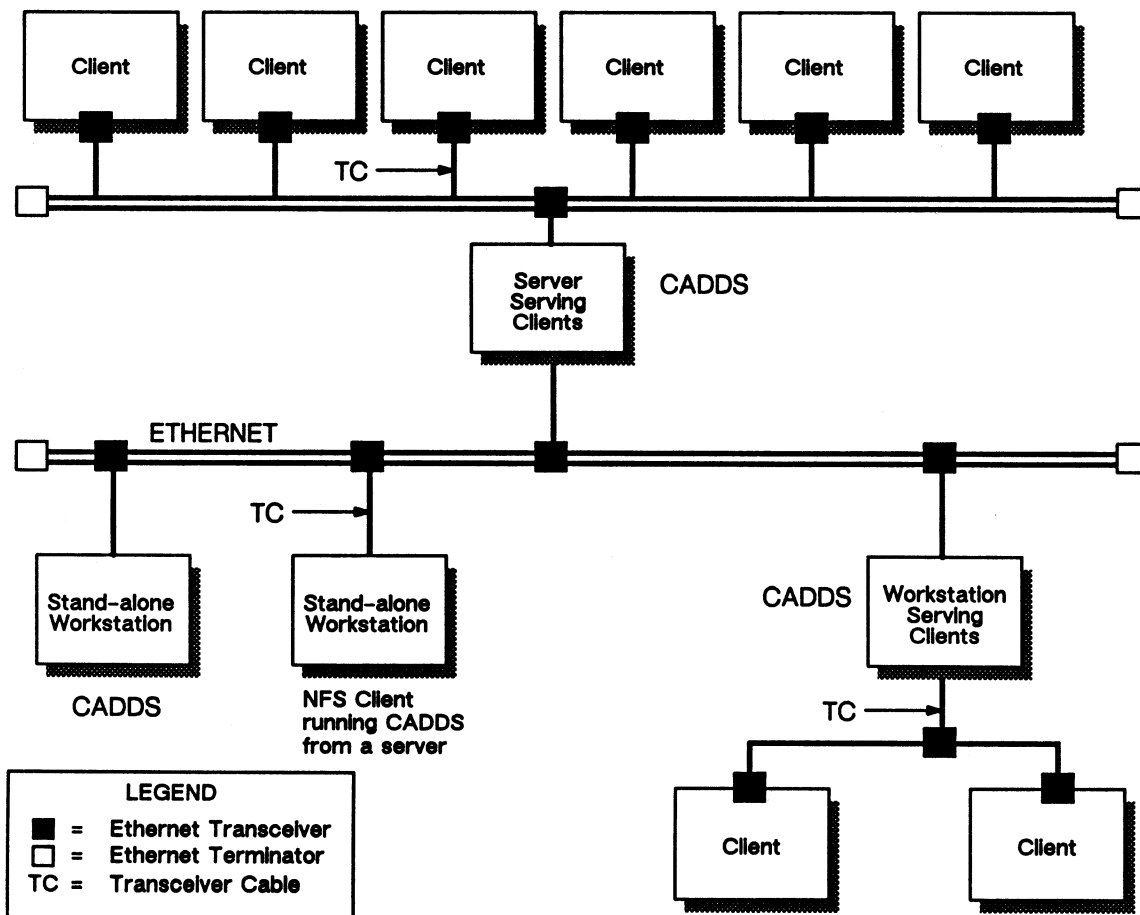
Planning Software Use

To plan how your software will be used, you must know which systems will be

- Servers that store operating system software for clients to use
- Clients to those servers
- Stand-alone systems with their own disks and operating systems
- Systems loaded with application software
- NFS clients: diskful systems that access applications or UNIX remotely using the Network File System (NFS)

One way to plan is to sketch your system configuration, as in Figure 1-1. Identify the software that will reside on each system and be used by each system. Be sure you know the specific optional software you plan to load: CADDs and CADDs applications, Electronics applications, Platform applications, and other applications.

Figure 1-1. Sample System Sketch



Planning to Install Applications under LMS

All Computervision-developed applications operate under the control of the LMS. Under LMS, you purchase a specific number of licenses to run each application. This enables your site to run up to the purchased number of sessions of that application simultaneously.

For example, if you purchase seven licenses to run CADDs, you can have seven people on different systems running CADDs at one time. If one of the licenses is not being used, you can transfer it to another system—that has CADDs loaded on it—for another person to use. The total number of people using CADDs at one time cannot exceed the number of licenses you purchased; in this example, seven.

Installing an Application under LMS

For the first installation of applications:

- The system you are loading must have a License Manager with a license for each application that you wish to load.
- Install the applications using the CADDs or applications procedures outlined in Sections 6 and 7.

For the second (or subsequent) installation of the same applications, you can do either of these:

- Proceed as above
- or
- Copy the applications via network or tape using the `tar` command. (See the network `tar` command in Copying CADDs to other Systems in Section 6.) Then transfer the necessary licenses to the second and subsequent systems to run the applications.

Note

If you want to install a different set of CADDs applications on the second or subsequent system, you must use the first procedure.

Running an Application under LMS

To run an application on a system, you must have both

- Access to the application; the application must be loaded on the system, or the system must be a client to a server on which the application is loaded, or the system must be set up to access the application remotely from another system.
- A license to run the application.

See *Installing and Using the License Management System* for specifics.

Preparing to Install Software

Summary of Steps to Load UNIX

You will install the UNIX operating system software by performing the following steps. Sections 1–5 of this book contain specific procedures. Installing UNIX on a new system takes approximately 2 to 2 1/2 hours.

1. Power on and halt your systems.
2. Insert the first tape in the tape drive.
3. Boot the **prepdisk** utility. Use it to label and partition disks.
4. Check the release bulletin for the latest information on system size requirements.
5. Load Base UNIX. Start the **worksheet** utility.

Tell the **worksheet** utility which optional UNIX utilities and applications you plan to load. Supply the **worksheet** utility with space requirements of any third-party applications you plan to load. The **worksheet** utility ensures that you have enough disk space for all your planned software. It produces disk partition maps showing where to place UNIX partitions.

6. Copy information from screen to photocopied disk partition maps.
7. Enter the **setup** utility.

Give the **setup** utility information from the **worksheet** utility. Give also information on clients, servers, Ethernet addresses, tape devices, networks, and, again, on optional software and applications.

8. Execute **setup**.

The **setup** utility partitions your disks, setting up **root**, **/usr**, and **swap** partitions. On servers, it also sets up a **/usr/servername** directory and a **/pub** partition. It loads the operating system options that you specified.

9. Set up the network files: **/.rhosts**, **/etc/hosts.equiv**, and **/etc/hosts**.
10. Reconfigure the UNIX kernel by making a new configuration file.
11. Reboot your system.

Formatting a Disk

It is not necessary to format new disks. Reformat a used disk only if

- You suspect disk corruption
- Your system has reported bad sectors

Procedures to format your disk are in Appendix E. As part of the procedure, you will run 5 surface analysis passes on the disk. Surface analysis takes about 2 to 2 1/2 hours: 30 minutes per pass (45 minutes for a 1GB disk) You may want to run the surface analysis during the night and finish installation the next day.

Summary of Steps to Load CADDs

You will load CADDs by performing the following steps. Section 6 contains specific procedures. Installing CADDs takes 2 to 3 hours.

1. Ensure that `/usr2` exists.
2. Redirect `/tmp` files.
3. Establish the CADDs base directory.
4. Load CADDs Object tapes with `loadappl`.
5. Run `assemblecadds`.
6. Load CADDs Additional tapes with `loadappl`.
7. Create CADDs part storage.
8. Set up a user named `cadds`.
9. Start the Graphics Accelerator.
10. Test CADDs.

If you want to install the same CADDs on another system, you can copy this CADDs to the other system via network or tape using the `tar` command. (See the network `tar` command in Copying CADDs to other Systems in Section 6.)

Correcting Errors

During system software installation, you may make an error that requires you to abort and begin again—after you press RETURN, your command cannot be corrected. Use the following keys to start a procedure over at any time.

L1-A On a workstation, aborts session for any reason and takes you monitor. (Hold down L1 and simultaneously type A.)

BREAK On an alphanumeric terminal, aborts session and takes you back to monitor.

Correct typing errors before you press RETURN, with these keys:

DEL or RUBOUT Backspaces over and erases characters. SHIFT-RUB needed on some terminals.

CTRL-u Erases entire line typed to point of cursor. (Hold down CTRL and type u.)

Error messages are explained in *Interpreting System Messages* in the *CADDStation Systems Manager Guide*. To report problems, refer to the problem reporting section of *Introducing CADDStation Revision 4.0*.

Preparing to Install Software

Contents of System Software Tapes

You receive one to three UNIX tapes, depending on whether you ordered Core UNIX, Full UNIX, or Kanji. Table 1-1 lists the files on these three tapes.

- **UNIX Tape#1—Core UNIX**—Contains a minimum amount of UNIX software for running applications and for performing basic system administration functions.
- **UNIX Tape#2—Full UNIX**—Adds additional UNIX utilities for program development.
- **UNIX Tape#3—Kanji**—Contains programs for running Kanji.

Table 1-1. System Software Tape Files

File Numbers	Contents
Tape#1	
0	General purpose boot program that can boot from any device
1	Table of Contents
2	Copyright file
3	prepdisk utility
4	Stand-alone copy program
5	Base UNIX, also called mini-root
6	Complete UNIX root file system
7	Japan root
8	/pub files
9	Client image
10	CADDS Relink Option
11	UIM Programs
12	Paper Punch Tape Reader
13	Graphics Hardcopy
14	Network Administration Tool
15	Networking tools and programs
16	Sun On-line Diagnostics
17	Kernel Configuration Files
18	/usr files
19	Copyright
Tape#2	
0	Copyright
1	Table of Contents
2	Revision
3	Additional System Utilities
4	Additional SunView User Programs
5	uucp Programs
6	System V Programs and Libraries
7	Text Processing Tools
8	Software Development Package
9	SunPro
10	FORTRAN Compiler and Libraries
11	Pascal Interpreter and Compiler

Table 1-1. System Software Tape Files

File Numbers	Contents
12	Sunview Programmers Files
13	Tablet Libraries
14	Kanji Libraries
15	UIM Libraries
16	Debugging tools
17	Source Code Control System
18	Setup tools
19	Copyright
Tape #3	
0	Copyright
1	Table of Contents
2	Revision
3	Japan Standard
4	Japanese Manuals
5	Japanese Optional UNIX Commands and Files
6	Japanese Software Development Package
7	Japanese UNIX Install Testing
8	Copyright

Preparing to Install Software

Setting Up Remote Host to Load Tapeless System

If you are going to load software on tapeless clients (that are configured as clients on a server), you do not need to prepare a remote host. The server is already prepared to access its clients.

If, however, you are going to load tapeless system that is not a client of a server, you must prepare a remote host, on which you will load the tape. You will boot the tapeless system across the network from the remote host. The remote host must

- Have UNIX software completely installed
- Have a tape drive
- Be running this release of CADDStation Systems software
- Be configured as either a server or stand-alone; it may *not* be a client
- If server, have at least 5MB of free disk space in the `/pub` partition
- If stand-alone, have at least 5MB of free disk space in the `/usr` partition

Before you begin this procedure, gather the following information:

- Name of the remote host
- Hardware Ethernet number of the remote host
- Internet number of the remote host
- Names of all tapeless workstations that you are installing UNIX on
- Hardware Ethernet numbers of all tapeless workstations
- Internet number of all tapeless workstations
- Eight-digit hexadecimal version of all Internet numbers

You can find the Ethernet number in the `/usr/adm/messages` file, or when you boot up the system. If you cannot find the Ethernet number, ask your Computervision field service representative.

The Internet number for your remote host can be found in the `/etc/hosts` file. Use `adb` to convert the Internet address to hexadecimal. For example, if the Internet address is 192.9.200.1, enter `adb`. `adb` does not display a prompt. List each part of the number separately preceded by `0t` and followed by `=X`, which tells `adb` to convert the number to hexadecimal. The system displays the hexadecimal equivalent. Type `CTRL-d` to exit. An example follows.

```
% adb
0t192=X
      c0
0t9=X
      09
0t200=X
      c8
0t01=X
      1
^D
%
```

To form the hexadecimal version of the Internet address 192.9.200.1, string together the eight characters in the right column: C009C801.

After you have gathered all necessary information, perform the following steps on the remote host:

-
1. Enter the **df** command to check the partition you want to load Base UNIX in.

```
rh# df
```

Check the **/pub** partition if your remote host is a server; check the **/usr** partition if your remote host is a workstation. The partition must have at least 5MB of free disk space.

df shows a display something like this:

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/sd0a	9140	6320	1906	77%	/
/dev/sd0g	76760	71000	5760	95%	/usr

In this example, the partition name is **/usr**. The *partition-location* (needed in step 2) is **sd0g**. The **/usr** partition is 76,760KB (equal to approximately 76MB), it already has filled 71,000KB (equal to 71MB), and it has 5,760KB left (equal to approximately 5MB). The number in the **avail** column must be larger than 5,000.

2. Copy your existing **/etc/nd.local** to a backup location:

```
rh# cp /etc/nd.local /etc/nd.local.back
```

Use **vi** to edit the **/etc/nd.local** file.

Add the following line:

```
user 0 public-unit-number /dev/partition-location 0 -1 -1
```

where:

public-unit-number is a positive integer. If no other line beginning with **user 0** exists in the file, choose 1. If there are one or more other lines in the file beginning with **user 0**, add 1 to the largest public number following a **user 0**.

partition-location is the place on the disk where the selected partition is located, obtained in step 1 above.

The order in this file must be

```
clear
version ...
....
user ...
....
son
```

If the last line, **son**, does not exist, add it.

3. Use **vi** to add the names of all tapeless workstations that you want to load from this system to each of the following files:

```
/etc/hosts
/etc/hosts.equiv
/.rhosts
```

Use **vi** to add the names and Ethernet addresses of these tapeless workstations to the following file, as **8:0:1:1:4a:33 alpha** for system **alpha**.

```
/etc/ethers
```

Preparing to Install Software

4. Make an entry in the /dev directory for a network disk and run the nd program as follows:

```
rh# cd /dev
rh# MAKEDEV ndl0
rh# /etc/nd - < /etc/nd.local
```

5. If your remote host is a server with clients and your partition name is /pub, then go to step 6.

If your remote host is a stand-alone or your partition name is /usr, then issue the following commands on the remote host to change /usr into a public partition:

```
rh# mkdir /partition-name/stand
rh# cp /stand/* /partition-name/stand
rh# cd /
rh# rm /pub (/pub may not exist)
rh# ln -s /usr /pub
rh# cp /boot /pub/boot
rh# cd /usr/mdec
rh# installboot bootnd /dev/partition-location
(partition location is probably xy0g)
rh# sync
```

6. Enter ps -ax to see if the /usr/etc/rarpd process is running:

```
rh# ps -ax
```

If it is not, issue the following command on the remote host:

```
rh# /usr/etc/rarpd ie0 remote-hostname
```

7. Issue the following command on the remote host, once for each tapeless workstation, giving each workstation's Internet address in hexadecimal. You must enter the hexadecimal Internet number in all *UPPERCASE* letters. (You obtained these numbers earlier using the adb command.)

```
rh# cd /tftpboot
rh# ln -s ndboot.sun3.pub0 hexadecimal-internet-number
```

These steps complete the preparation of a remote host for loading tapeless systems.

Getting Started—Halting Your Systems

To begin the loading procedures, you need to halt the systems you will be installing.

Halting Systems without Software

If this is a new system and there is no software loaded on your system, turn on the system and abort the auto-boot procedure as follows:

1. If you are loading a server, turn on the server and its tape drive. Or, if you have a workstation, turn on the processor cabinet via the switch on the front of the cabinet. Next, turn on your monitor.
2. Your monitor screen flashes momentarily. The system is running diagnostics to ensure the equipment is operating correctly.

The Computervision logo and some information appear. For example

```
Self Test completed successfully.  
Workstation, Model model-number, keyboard-type.  
ROM Rev N, nnnnnn MB memory installed  
Serial # nnnnnnnn, Ethernet address n:n:n:n:n  
Auto-boot in progress...
```

Let the auto-boot run until you see the Ethernet address. Write down the Ethernet address before it goes off the screen. You will need the Ethernet address later.

While the Auto-boot is in progress, abort it as follows:

- On a graphics keyboard press the L1 and A keys simultaneously.
- On an alphanumeric terminal, press the BREAK key.

3. The monitor responds: Abort at XXXXXX (where XXXXXX is the source address). Then the monitor > prompt appears.

If you receive any error messages, see Appendix D.

Halting Running Systems

If you have systems that are running, you must halt them. Before halting each system, get its Ethernet address with the command `grep Ethernet /usr/adm/messages`. Write down the Ethernet address for each system. You will need it later.

WARNING

The installation process destroys all existing files. Back up any files you want to save before continuing.

1. If you have clients, and the clients are running, halt the clients before halting the server. Issue these commands on each client:

```
# sync  
# /etc/halt
```

Then shut off the client. If the `/etc/halt` command fails, press the L1 key while simultaneously typing A; then shut off the client.

Preparing to Install Software

2. On a server or stand-alone workstation, in the root directory, execute the `/etc/halt` command. If you are in the boot procedure, or if the `/etc/halt` command fails in root, press the L1 key while simultaneously typing A.

Loading Tapes

The software needed to load UNIX is contained on 1/2-inch reel tapes or 1/4-inch cassette tapes. After your systems are halted, mount the first tape on your system. The first tape is labeled UNIX 4.2, Tape #1. Figure 1-2 illustrates the different tapes and drives.

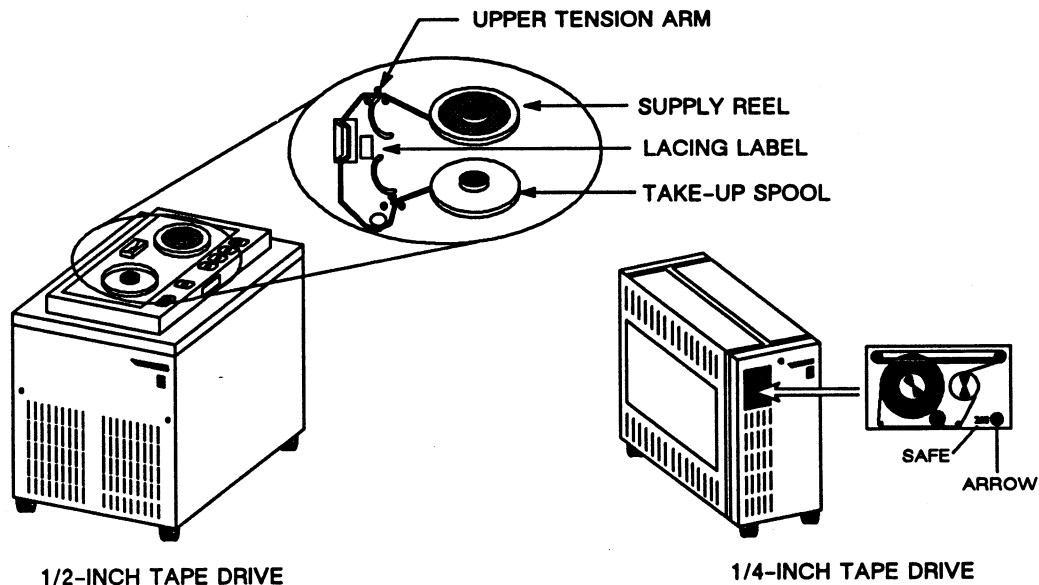
Loading and Write Protecting 1/2-inch Tapes

To load your 1/2-inch tape, remove the write-ring, if there is one, from the back of the reel, then mount the tape on the tape drive, as shown in *Using the CADDServer* in the *CADDStation Systems Manager Guide*, and put your drive on-line.

Loading and Write Protecting 1/4-inch Tapes

Hold the tape cartridge so the small window with the word **SAFE** is at the lower right corner of the cartridge. When the arrow points to **SAFE**, the tape *cannot* be written over; when the arrow points 180° away from **SAFE**, the tape *can* be written over. Firmly push down the black plastic holder on the front of the tape drive and insert the cartridge into the slot. The metal side of the cartridge should face the right. The exposed part of the magnetic tape should be at the bottom, as shown in Figure Figure 1-2. Firmly push the black plastic handle back up to hold the tape in. Listen for a click and a short whirring sound.

Figure 1-2. 1/2-inch and 1/4-inch Software Tapes and Tape Drives



You can perform several disk preparation functions with the **prepdisk** utility. This section describes how to use the automatic mode of **prepdisk** to partition and label disks, suitable for most installations. In special circumstances, listed below, you use the manual mode of **prepdisk** to partition and label a disk.

This section includes instructions for

- Booting **prepdisk** from tape or on a tapeless system
- Partitioning and labeling disks using the automatic mode of **prepdisk**

When to Use the Automatic Mode of prepdisk

On most disks you use the automatic mode of **prepdisk**, described in this section, to partition and label a disk.

When to Skip the prepdisk Utility

If you are upgrading to a new revision of UNIX, your disk is already partitioned and labeled. Skip this section and go to Section 3.

When to Use the Manual Mode of prepdisk

You need to use the manual mode of **prepdisk** if any of your disks have no labels (as shown later by **prepdisk**). If you need to use the manual mode of **prepdisk**, see Appendix A for instructions.

When to Reformat a Disk with prepdisk

If you are installing a new system, you do not need to format your disk. Disks are delivered already formatted. You need to reformat a disk with **prepdisk** if any of the following is true:

- On a running system, if you have received numerous disk error messages on a running system or suspect data is being lost
- If a flaw map on a disk Y or Z is full
- If you have both a disk type V and a disk type A on the same controller
- If you have both a disk type W and a disk type X on the same controller
- If you have both a disk type Y and a disk type R on the same controller
- If you have both a disk type Z and a disk type S on the same controller

When to Restrict Disk Flaws with prepdisk

If you have a running system, and you have received several disk error messages for the same sector in `/usr/adm/messages`, you can restrict this sector from use with the **prepdisk** utility. Instructions for handling these system-reported disk flaws are in Appendix E.

Partitioning and Labeling Disks—prepdisk Utility

prepdisk Prompts

When you are in **prepdisk**, the **PREPDISK_AUTO>** prompt appears. When you change to one of the subsystems of **prepdisk**, the prompt changes, telling you whether you are in automatic or manual mode, and the subsystem you are in. For example, the prompt changes to **PREPDISK_AUTO/PARTITION** for the automatic mode of the partitioning and labeling subsystem, or to **PREPDISK_AUTO/FORMAT** for the automatic mode of the formatting subsystem.

prepdisk Command Abbreviations

When you enter commands in **prepdisk** or any of its subsystems, you can enter the entire command name or an abbreviated name. **prepdisk** responds to the shortest unique string of letters. For example, to access any of its help menus, you can enter either **help** or **h**.

CAUTION

Do *not* power down the system by turning off the front switch when you are installing software. You risk corrupting your disk and having to reload. After installing system software, use **halt(8)** or **fasthalt(8)** to stop the system.

Booting prepdisk from Tape

Follow these steps to load the boot program and the **prepdisk** programs from tape. If you receive any error messages when attempting to boot from tape, see Appendix D.

1. After you have halted your systems and loaded UNIX Tape 1, enter the next command to boot the first file on the tape, the boot program. (See Table 1-1.)

The **boot** command is abbreviated to **b**; the **st**, **mt**, or **xt** indicates 1/4-inch, 1/2-inch Tapemaster controller, or 1/2-inch Xylogics controller respectively. The two parentheses, (), default to the entry 0,0,0, as reported by the system; the last number, here 0, refers to the file number on the tape.

If you are booting from a 1/4-inch tape, enter the following at the **>** prompt:

```
> b st( )
```

If you are booting from a 1/2-inch Tapemaster controller, enter the following at the **>** prompt:

```
> b mt( )
```

If you are booting from a 1/2-inch Xylogics controller, enter the following at the **>** prompt:

```
> b xt( )
```

The system displays the following message, where *tape* is **st**, **mt**, or **xt**.

```
Boot: tape(0,0,0)
Boot:
```

2. Next you boot file number 3, the **prepdisk** utility. At the **Boot:** prompt, enter the following:

For a 1/4-inch tape:

Boot: **st(0,0,3)**

For a 1/2-inch Tapemaster controller:

Boot: **mt(0,0,3)**

For a 1/2-inch Xylogics controller:

Boot: **xt(0,0,3)**

Booting prepdisk on a Tapeless System

To boot **prepdisk** on a tapeless system, you must insert UNIX Tape #1 on the remote host's tape drive. The remote host must be able to access your tapeless system. Either the remote host must be a taping server to which your tapeless system is configured as a client, or else the remote host must be prepared according to the instructions in Section 1, the subsection called Setting Up a Remote Host to Load a Tapeless System.

Use the following command to boot **prepdisk** from a diskful client that is a Model 32 or 34. If the tapeless system is a Model 30 or 33, enter **le** in place of **ie**.

> **b ie(0,ia,pu)stand/prepdisk**

ia is the two last digits of the hexadecimal internet address of the remote host.

pu is the *public-unit-number* you entered in the */etc/nd.local* file.

Partitioning and Labeling Disks—prepdisk Utility

Partitioning and Labeling Your Disks with prepdisk

This subsection gives procedures for using the `prepdisk` utility to partition and label your disks using the automatic mode of `prepdisk`. `prepdisk` performs a rough partitioning of the disk. Later, you will use the `worksheet` and `setup` utilities to define partitions to your system's exact needs.

1. The system gives a size message, then asks you to select automatic or manual mode. The screen displays the following:

```
CADDStation PREPDISK Disk Initialization and Diagnostic
Rev-3.18 8/12/88. Copyright (c) <1986> by Computervision
Corporation as an unpublished work. All rights reserved.
```

```
Enter "A" to select automatic mode or
      "M" to select manual mode (A/M) ? <CR=A>
```

Press RETURN to select automatic.

2. The system displays a list of your disks, their types and sizes. A prompt asks you to select a disk. Disks with SMD drives (large disk sizes) display drive type numbers; those with SCSI drives (small disk sizes) display target numbers. For example

Disk Sizing, please wait for about 1 minute...

```
0 - target #nn/unit #nn
   disk type __ unfor/for cyl nnn alt nn hd nn sec nn <Embedded SCSI>
1 - target #nn/unit #nn
   disk type __ unfor/for cyl nnn alt nn hd nn sec nn <Embedded SCSI>
2 - target #nn/unit #nn
   disk type __ unfor/for cyl nnn alt nn hd nn sec nn <Embedded SCSI>
3 - target #nn/unit #nn
   disk type __ unfor/for cyl nnn alt nn hd nn sec nn <Embedded SCSI>
4 - Manual entry
```

Select a disk or type "?" for help <CR=0> ?

Check to make sure that `prepdisk` recognizes all your disks. There should be two lines for each disk. This example shows four disks, numbered on the left as 0-3. In the display above, *unfor* is the unformatted size of the disk, *for* is the formatted size.

If all your disks appear on the list, with sizes listed, enter 0 to work on your first disk (from here on, called the *primary* disk). Enter 1 to work on your secondary disk, and so on.

WARNING

Check the list of circumstances shown in *When to Use the Manual Mode of prepdisk*. If any of these apply to your configuration, select 4 from the menu and turn to Appendix A, *Manual Mode of the prepdisk Utility*.

3. The system displays: Performing Initialization on selected Disk type: followed by messages about the disk you selected. Then the Automatic Mode Formatting Menu appears.

Automatic Mode Formatting Menu:

- 1 - Format
- 2 - Partition & Label
- 3 - Change Disk
- 4 - Exit to PREPDISK_AUTO

Please enter your selection or type "?" for help <CR=4>

Select 2 to partition and label your disks.

The rest of the steps in this procedure tell you how to partition your primary disk. If you have more than one disk, the instructions tell you when to repeat the process for your second and third disks.

4. The Partition Sub-commands menu appears, and the prompt changes to PREPDISK_AUTO/PARTITION:

PARTITION Sub-commands menu:

- Quit - Quit the Partition command
- Help - Print out this menu, additional help if requested
- RP - Recover Partition table from disk
- DP - Default Partition table
- CP - Current Partition table in memory
- LA - Label the Disk

PREPDISK_AUTO/PARTITION>

Enter **dp** for the default partition table.

(If you are changing the partition table on a disk that has been used, enter **rp** to capture the existing information. Enter **cp** to edit the existing information and record your changes. See Appendix I, Increasing swap with the **prepdisk** Utility, for more information.)

5. The system prompts

Is this a primary or secondary disk (P/S)? <CR=P>

If you are working on the first disk, enter **p** or press RETURN to select the primary partition map. If you are working on the second or subsequent disks, select the secondary partition map, by entering **s**.

6. If you are working on the primary disk, the system prompts

Is this a Fileserver (Y/N)? <CR=Y>

If you plan to serve clients from your current system, enter **y** or RETURN for yes.

If you do not plan to serve clients from this system, enter **n** for no.

Partitioning and Labeling Disks—prepdisk Utility

7. The system displays the default partition table for your disk. The system fills in the number of megabytes in each partition. On systems with clients, empty partitions are listed with a size of 0.00. On systems without clients, the screen displays only the partitions in use.

If your system serves clients, the screen displays

Default partition table for 'disk type __'

The screen displays the following partition table for all systems:

Partition Mbytes	StartingCylinder	Sectors	Cylinders
a			15.00
b			16.20
c			____.____
d			____.____
e			____.____
f			____.____
g			____.____
h			____.____

The screen prompts

Do you wish to modify this table (N/Y) ? <CR=N>

If you are working on a new disk, you do not want to modify the table. Enter **n** or RETURN for no.

(Experienced users may use **prepdisk** to repartition used disks. If this is your intent, enter **y** for yes. The utility asks you to enter new values for each partition.)

In **setup**, described in Section 4, you will configure your disks more exactly.

8. The system displays a message and a prompt after it initializes the disk:

Use the label command to write out the partition table.
PREPDISK_AUTO/PARTITION>

Enter **la** to label the disk.

9. The system asks you to confirm this.

Are you sure you want to label the disk (Y/N) ? <CR=N>

Enter **y** for yes.

10. The system displays messages and the PREPDISK_AUTO/PARTITION> prompt.

Writing primary label to disk . . ok
Writing backup labels to disk . . ok

PREPDISK_AUTO/PARTITION>

Enter **q** to return to the Automatic Mode Formatting menu.

11. The screen displays

Automatic Mode Formatting Menu:

- 1 - Format
- 2 - Partition & Label
- 3 - Change Disk
- 4 - Exit to PREPDISK

Please enter your selection or type "?" for help <CR=4>

If you have another disk to format, enter 3 to change disks.

Then go back to step 1 of these instructions and repeat all steps to this point.

If you have partitioned and labeled all your disks, enter 4 to return to the main **prepdisk** utility.

12. The PREPDISK_AUTO> prompt appears.

Enter **q** to quit **prepdisk**.

The **BOOT:** prompt appears.

You are ready to go to Section 3 of this manual, **Determining Required Disk Space—worksheet** utility.

Determining Required Disk Space—worksheet Utility

3

Determining Required Disk Space—worksheet Utility

3

From information that you provide, the **worksheet** utility calculates sizes and locations of disk partitions for your system. The utility asks you questions about your type of system, configuration, and software and produces a chart for each disk, called a **Disk Partition Map**.

For each **Disk Partition Map**, you will copy information from the screen onto photocopies of the forms provided at the end of this section. You will be asked for this information later in the installation procedures.

The procedures in this section assume that you have partitioned and labeled your disks using the **prepdisk** utility, described in Section 2.

Before you use the **worksheet** utility, you must have a small subset of the UNIX operating system, here called **Base UNIX**, from UNIX Tape #1 onto your disk. This section gives instructions for loading **Base UNIX**, then shows you how to use the **worksheet** utility.

After you complete this section, you are directed to Section 4, where you configure your disks and load system software using the **setup** utility.

NOTE This utility has the following limitations:

- It does not do cylinder boundary checking on any systems.
 - Stand-alone workstations can have a combination of 85MB, 170MB, or 380MB disks only. Servers can have a combination of 300MB, 515MB, or 1GB disks only.
 - It assumes 68020 architecture on servers and stand-alones.
-

Determining Required Disk Space—worksheet Utility

Loading Base UNIX

To run the **worksheet** procedures, you must put a basic subset of the UNIX operating system (referred to as **Base UNIX**) on your disk and boot to that subset. This takes approximately 10 minutes. Select the procedure that applies to your system:

- Loading Base UNIX on a Stand-alone or Server
 - Loading Base UNIX on a Tapeless System
-

NOTE Disks of 85MB, 170MB, and 380MB are SCSI disks. Disks of 300MB, 515MB, or 1GB are SMD disks.

The following procedures assume that a 1/4-inch tape drive (designated by **st**) is paired with SCSI disks (designated by **sd**) and that a 1/2-inch tape drive (designated by **mt** or **xt**) is paired with SMD disks (designated by **xy**). Occasionally sites have a 1/4-inch tape drive with SMD disks or a 1/2-inch tape drive with SCSI disks. If this is the case on your system, then modify the following procedures accordingly, as: From: **st(0,0,5)** To: **xy(0,0,1)** or From: **mt(0,0,5)** To: **sd(0,0,1)**.

Loading Base UNIX from Tape

With UNIX Tape #1 inserted, do the following to load base UNIX on system with a tape drive:

1. The first command loads a copy program that can copy Base UNIX from tape. (See Table 1-1 for the files on tape and their tape numbers.)

Enter the following at the prompt:

For a 1/4-inch tape drive:

Boot: **st(0,0,4)**

For a 1/2-inch tape drive, use **mt** for a Tapemaster controller or **xt** for a Xylogics controller:

Boot: **tape(0,0,4)**

The system displays a size message and the words **standalone copy**.

2. This command copies Base UNIX from tape to your disk.

Enter the following at the prompts:

For a 1/4-inch tape drive and a SCSI disk:

From: **st(0,0,5)**

To: **sd(0,0,1)**

For a 1/2-inch tape drive (use **mt** for a Tapemaster controller or **xt** for a Xylogics controller) and a SMD disk:

From: **tape(0,0,5)**

To: **xy(0,0,1)**

-
3. After approximately 10 minutes, the system displays the Boot: prompt.

Enter the following to boot Base UNIX:

To boot from a SCSI disk:

```
Boot: sd(0,0,1)vmunix -as
```

To boot from an SMD disk:

```
Boot: xy(0,0,1)vmunix -as
```

4. The system displays a series of messages. For example

```
CV UNIX 4.2 Release 5.3G (GENERIC) #1 Wed July 20
19:23:57 EDT 1988
Copyright (c) 1987 by Computervision Corporation
mem = 8192K (0x800000)
avail mem = 7307264
Ethernet address = 8:0:1:1:45:ba
```

The system then asks which disk holds the root partition. Enter the following:

To boot from a SCSI disk:

```
root device? sd0*
```

To boot from an SMD disk:

```
root device? xy0*
```

You *must* include the asterisk.

5. If you receive a message that the clock gained or lost time, check and reset your date and time with the following command:

```
# date yymddhhmm.ss
```

You are ready to use the **worksheet** utility.

Loading Base UNIX on a Tapeless System

To load base UNIX on a tapeless system, the remote host must be configured according to the instructions in Section 1, the subsection called Setting Up a Remote Host to Load a Tapeless System.

1. Mount the first UNIX distribution tape, labeled UNIX 4.2, Tape 1, on the remote host. Then issue these commands:

For a 1/4-inch tape drive:

```
rh# mt -f /dev/rst0 rew
rh# mt -f /dev/nrst0 fsf 5
rh# dd if=/dev/rst0 of=/pub/minifs bs=120b
rh# sync
```

For a 1/2-inch tape drive:

```
rh# mt -f /dev/rmt0 rew
rh# mt -f /dev/nrmt0 fsf 5
rh# dd if=/dev/rmt0 of=/pub/minifs bs=120b
rh# sync
```

Determining Required Disk Space—worksheet Utility

2. The following steps are done at each tapeless workstation. This command boots the copy program from the remote host. (If your system is a Model 33 or a Model 30, substitute **le** for **ie**.)

```
> b ie(0,ia,pu)stand/copy
From: ie(0,ia,pu)minifs
```

where *ia* is the last digit(s) of the hexadecimal Internet address of the remote host.

pu is the *public-unit-number* you entered in the `/etc/nd.local` file.

If loading a workstation or a workstation that serves clients, do the following to boot the Base UNIX from across the network. (If your system is a Model 33 or a Model 30, use **le** instead of **ie**.)

```
To: sd(0,0,1)
> b ie(0,ia,pu)boot -a
Boot: sd(0,0,1)vmunix -as
root device? sd0*
```

If loading a tapeless server, do the following:

```
To: xy(.,1)
> b ie(0,ia,pu)boot -a
Boot: xy(0,0,1)vmunix -as
root device? xy0*
```

You *must* include the asterisk.

3. The system displays a series of messages. For example

```
CV UNIX 4.2 Release 5.3G (GENERIC) #1 Wed July 20
19:23:57 EDT 1988
Copyright (c) 1987 by Computervision Corporation
mem = 8192K (0x800000)
avail mem = 7307264
Ethernet address = 8:0:1:1:45:ba
```

4. If you receive a message that the clock gained or lost time, check and reset your date and time with the following command:

```
# date yymmddhhmm.ss
```

You are ready to use the **worksheet Utility**.

Using the worksheet Utility

You are going to use the **worksheet** utility to calculate partition sizes for all the applications that you plan to run.

NOTE Before using the utility, be sure that you have a copy of the release bulletin for the current software release and any supplements to the release bulletin. The release bulletin may contain important information on the memory and swap size requirements called for in this utility for the application that you are installing.

If you realize that you have made a mistake after the **worksheet** utility has moved to the next item, you must rerun the utility.

1. At the single user prompt, you must enter the **setup** utility to run the **worksheet** utility.
-

NOTE If you are running the **worksheet** utility for a second time, you must remove the **/tmp/worksheet.log** file before entering **setup**. If you do not remove this file, **setup** skips the following **worksheet** utility question.

setup

Answer **y** to the following question.

```
Do you want to execute the Worksheet Utility before running
setup (y/n <CR>=y)
>> y
```

2. The system describes the utility and asks if you want to continue.

WORKSHEET UTILITY

The **Worksheet Utility** allows you to quickly determine **Partition Maps** for a given set of software and a given set of disk configurations.

This utility also allows you to:

- . look at many different configurations in order to change a production environment;
- . help troubleshoot installations over the phone;
- . identify problem areas prior to installation or purchase.

Utility Revision Check

CV UNIX 5.3G (SunOS 3.5)

This utility is for the revision listed above.

Please confirm that this is the revision you want.

NOTE: SOFTWARE SIZES APPLY TO THIS REVISION ONLY.

Do you want to continue ? <y/n RETURN = y>

Enter **y** or **RETURN** for yes.

Determining Required Disk Space—worksheet Utility

3. In this step, you enter information about application sizes. The system displays

If your Release Bulletin contains application sizing information, answer yes to the following question. This utility will then prompt you for that information.

If you have not received application sizing information, press RETURN.

Do you want to change the application sizes used by this utility ? <y/n RETURN = n>

If you have not received new sizing information, press RETURN and go to step 6.

4. If the release bulletin, services bulletin, or your field service engineer gives you new sizes for any of the applications, enter y for yes.

The system displays tables of applications and their sizes, one-by-one, and asks if you want to change them. A sample follows:

NOTE

This is a sample only. Your display will differ.

WORKSHEET UTILITY

DEFAULT SIZES FOR CADDs APPLICATIONS

Application Name	File System Space (M Bytes)	Swap Size (M Bytes)
CADDs Program Development	30	1
CADDs Graphics	33	10
Kanji	14	4
CADDs Options	4	1
Production Drafting	2	1
CADDs FEM	2	9
Imagedesign	2	30
Area & Vol Calc	1	1
Mass Properties	1	1
ASD	6	2
NURBS	14	8
Solidesign	4	13
Mech Simulation	2	1
CVNC-P2	5	5
CVNC_M2/T2	9	5
CVNC-M3	12	5
CVNC-M5	12	5
CVGP II	1	0
DDF/Specials	5	4

Do you want to change this table ? <y/n RETURN = n> y

If the displayed table is one that you need to change, enter y for yes.

If the displayed table is not one that you want to change, enter n for no; the next table is displayed.

5. If you do need to change the displayed table and you answered y, the system displays each application one-by-one, asking after each whether or not you want to change the displayed defaults. Answer y for yes or n for no.

File System Space of 14 and Swap Size of 8 for NURBS
Do you want to change these defaults ? <y/n RETURN = n>

If you answer yes, the prompts ask you to fill in the correct numbers.

Enter the new file system space.

You may enter a number from 1 through 100: 16

Enter the new swap size.

You may enter a number from 0 through 100: 10

6. Specify the type of system you are configuring. For example, the system prompts

System Configuration

1. Stand-alone (Models 32CV, 32MV, 33C, 33M, 33FC, 32C, 34C and 32M)
2. Stand-alone (Models 32S and 34S)
3. File Server (Models 32C and 32M)
4. File Server (Models 32S and 34S)

Enter the number which represents your system:

You may enter a number from 1 through 4:

Enter the number that corresponds to your system. Choices are defined as follows:

- Models 32CV, 32MV, 32C, 34C, 32M (workstations with 85MB, 170MB, or 380MB disks)
- Models 33C, 33M, 33FC (Professional series workstations with 170MB disks)
- Models 32S and 34S (file servers with 300MB, 515MB, or 1GB disks)
- Models 32C and 32M (workstations with 85MB, 170MB, or 380MB disks serving clients)
- Models 32S and 34S (file servers with 300MB, 515MB, or 1GB disks serving clients)

If you are configuring a stand-alone, enter 1 or 2 and go to step 8.

Determining Required Disk Space—worksheet Utility

7. If you are configuring a file server, enter 3 or 4. The system prompts for client information. Answer each prompt according to your configuration.
-

CAUTION

The **worksheet** utility can compute the disk space needed for up to 10 clients. However, the standard CADDStation configuration supports up to only 6 diskless CADDs clients. At the following prompt, you must select a number from 0 through 6.

The system prompts

You may only have a total of 10 clients.
Enter the number of 68020 clients.
You may enter a number from 0 through 10:

Enter a number from 0 to 6.

Do your 68020 clients have color monitors ?
<y/n RETURN = y>

If any of your 68020 clients have color monitors, answer y.

Enter the number of 68010 clients.
You may enter a number from 0 through 2:

A server may have a maximum of two 68010 clients.

Enter a number from 0 to 2.

Do your 68010 clients have color monitors ?
<y/n RETURN = y>

If any of your 68010 clients have color monitors, answer y.

8. In this step, you tell the **worksheet** utility whether you have one tape or two tape UNIX. One tape UNIX allows you to use the UNIX operating system to run applications; two tape UNIX adds UNIX programming environment capabilities. See Table 1-1 for the files that are on each of the tapes.

If you have a file server with 68010 clients, the utility asks the questions separately for the 68020 server and for the 68010 clients.

WORKSHEET UTILITY

UNIX Tape Sets for MC68020 CPU

1. One Tape (to run and link applications)
2. Two Tapes (includes a programming environment)

Enter the number which represents your system:
You may enter a number from 1 through 2:

Enter the appropriate answer for your server or stand-alone.

If you are going to run UNIX using NFS from another system, enter 1 (see Creating a Diskful NFS Client in Appendix H).

-
9. In this step, you tell the utility what optional software you will run. The system displays

WORKSHEET UTILITY

UNIX Software Choices for MC68020 CPU

1. No Optional Software
2. Common Choices (to run applications)
3. All

Enter the number that represents your system:
You may enter a number from 1 through 3:

If your system is to run applications, enter 2 for common choices. If you want a program development system, enter 3. If you are going to run UNIX using NFS from another system, enter 1 (see Creating a Diskful NFS Client in Appendix H).

If you have a fileserver serving 68010 clients, the system prompts for the tape sets and software choices for the clients. Prompts displayed are the same as shown above. Respond accordingly.

10. For some system configurations, the system prompts for whether you have dual disk controllers:

Do you have dual disk controllers? <y/n RETURN = y>

A single disk controller can have up to four disks on it. If you have more than four disks, you must have two disk controllers. Answer y only if you are using more than a single disk controller.

11. Through a series of menus, the system asks which application packages you plan to run on your system. To answer the prompts, you should decide the following:

- CADDs software packages you are licensed to use—if configuring a server, for specific applications, how many sessions you plan to run from the server, for CADDs, Solidesign, Imagedesign, CADDsFEM, and StressLab. A single session is a user at a client running the application. For example, if you would like five users on your five clients to be able to run Solidesign simultaneously, answer 5 to the question about Solidesign sessions.
- If the system is a stand-alone, whether it will use those packages locally or networked.
- Electronic application packages you are licensed to use—if configuring a server, the number of sessions you plan to run from the server.
- Types of printers and plotters you plan to use.

A sample CADDs menu follows.

Determining Required Disk Space—worksheet Utility

NOTE

This is a sample only. Your display will differ.

WORKSHEET UTILITY

CADDS Application Software

1. None
2. CADDs Program Development (/0500, 0550)
3. CADDs Graphics (/1900, 1907)
4. Kanji (/0900, 1007)
5. CADDs Options (/1002-6, 1501)
6. Production Drafting (/3020)
7. CADDs FEM (/3024)
8. Imagedesign (/3025)
9. Area & Vol Calc (/3040)
10. Mass Properties (/3050)
11. ASD (/3000-1, 3060)
12. NURBS (/3000-3003)
13. Solidesign (/3005-8, 3076)
14. Mech Simulation (/3080)
15. CVNC-P2 (/3534)
16. CVNC-M2/T2 (/3520, 3530)
17. CVNC-M3 (/3522)
18. CVNC-M5 (/3525)
19. CVGP II (/35xx)
20. DDF/Specials (/5xxx)
21. AEC Menu

Enter the numbers separated by spaces that represent your system:

You must enter at least one selection. Answer none if you are not loading any of the displayed software. Use the numbers in the left column. You must enter each number separately, as:

2 3 5 6 7 10 14

If you select certain CADDs applications, the utility asks if you want to run local or networked CADDs.

Application Configuration

1. Local CADDs
2. Networked CADDs

Enter the number which represents your system.
You may enter a number from 1 through 2.

If you plan to install CADDs on this system, enter 1.

If you plan to run CADDs on a remote system and access it from this system (through NFS), enter 2.

The worksheet utility displays other menus and questions depending on your configuration. Answer as appropriate. (For information on sessions, reread step 11.)

-
12. After you have entered information about Computervision software, the system asks if you plan to run any third party software.

If you want to load third party software on your system as published in the Catalyst catalog, answer yes to the following question. This utility will then prompt you for information.

If you do not want to load any third party software, press RETURN.

Do you want to load third party software on your system ? <y/n RETURN = n>

If you are not planning on loading any third party software, press RETURN after this prompt and skip step 13.

13. If you are planning to load third party software, answer y.

The system asks you for the sizes of any third party software packages you plan to run on your system. Some of these packages, with their required file system size and swap size, are documented in the Sun Microsystems, Inc., *Catalyst* catalog. This catalog is not supplied by Computervision. See the release bulletin, *Introducing the CADDStation Revision 4.0*, for ordering information.

You will be prompted for the number of software packages you plan to load, and the file system space and swap size of each package. The screen displays the following; respond according to the software packages you plan to load:

Enter the number of third party software packages.
You may enter a number from 1 through 100:

Enter the file system size and swap size
of each application.

Application 1

Enter the file system space in megabytes.
You may enter a number from 1 through 100:

Enter the swap size in megabytes.
You may enter a number from 1 through 100:

Is a dot matrix plotter configured on your system? <y/n>

Will this file server be used to build tapeless
systems? <y/n RETURN = n>

14. Next, the worksheet utility checks to see if you have enough disk space to run all the options that you chose.

You are asked for the size of each of your disks.

If you do not remember the sizes of your disks from **prepdisk**, check your hardware packing slip. If you have a multiple disk system, choose your disks in the order they are configured. For example, if a 515MB disk is configured as disk 0, choose the 515MB disk first.

Determining Required Disk Space—worksheet Utility

If you have models 32CV, 32MV, 32C, 32M, , 33C, 33M, 33FC, or 34C, the system displays

Disk 0 Configuration

	Unformatted	(Formatted)
1.	85 MB	67 MB
2.	170 MB	135 MB
3.	380 MB	311 MB

If you have models 32S and 34S, the system displays:

Disk 0 Configuration

	Unformatted	(Formatted)
1.	300 MB	240 MB
2.	515 MB	393 MB
3.	1000 MB	851 MB

Enter the number which represents your system:

You may enter a number from 1 through 3:

Enter 1, 2, or 3 to indicate the size of your first disk, disk 0.

15. The system adds up all the sizes of all the software you said that you plan to run, as well as UNIX and swap needs. It subtracts this number from the available space on the first disk.

Depending on the result, the utility either displays the questions shown in step 17 or it asks if you have another disk. The utility repeats this process for each disk.

Do you have another drive? <y/n RETURN = y>

If you say no, you may get an error. If you have specified more software than fits, the system tells you what you do not have room for, such as:

CLIENTS will not fit on your system

The worksheet exits abruptly.

If you see such a message, plan how to distribute your software on other systems, and reduce the number of applications on the current system. Go back and run the entire worksheet utility again.

If you have a second disk, it reports information for the second disk, like the following:

You still require 69 Megabytes of formatted disk space for the software that you have selected.

Disk 1 Configuration

	Unformatted	(Formatted)
1.	300 MB	240 MB
2.	515 MB	393 MB
3.	1000 MB	851 MB

Enter the number which represents your system.

You may enter a number from 1 through 3:

Enter the number that represents your second disk.

-
16. It subtracts again. When all of your software has been accounted for, it reports how much room is left over:

324 Mbytes are available for part storage.

Do you want part storage on this disk? <y/n RETURN = y>

Answer y. CADDs systems need as much room for part storage as they can get.

Enter the amount of part storage that you want.

You may enter a number from 1 through 324:

The answer to this question is irrelevant. All this space is put in /usr where it is available to you for part storage. Enter 1.

17. The system asks

Do you have another drive? <y/n RETURN = y>

If you do not have another drive, answer n.

If you do have another drive, answer y.

If you answer y, the utility asks for the size of the disk and if you want all the space for part storage. Again, answer y.

The system asks whether you have more disks, until you answer n.

If there is enough space for the software you specified, the *worksheet* utility displays your Disk Partition Maps.

Disk Partition Maps

The *worksheet* utility displays all the Disk Partition Maps you need for your system, one at a time. The next several pages show maps for stand-alone and file server systems.

1. Make photocopies of the maps you need for your system.
2. Write the information from your screen display on the corresponding map.
3. To move to the next map, press RETURN.

After the utility displays all the maps you need, it gives the message **WORKSHEET UTILITY COMPLETE** and displays the # prompt. You are finished with the *worksheet* utility. Go to Section 4 to configure your system and load system software with the *setup* utility.

The *worksheet* utility places this information in the file `/etc/worksheet.log` for future reference.

Determining Required Disk Space—worksheet Utility

Stand-alone Disk Partition Maps

Photocopy this page and fill in the underscored fields from the worksheet utility screen.

Stand-alone Disk Partition Map—Disk 0

WORKSHEET UTILITY

DISK 0 PARTITION MAP

Designation	Hard Partition	Mount Point	Size (M bytes)
a	Root		_____
b	Swap		_____
c	Entire Disk		
d	Free		0
e	Free		0
f	Free		0
g	Usr	/usr	_____

h	Free		0

Total Disk Space = _____

Press RETURN to continue:

Stand-alone Disk Partition Map—Disk 1

Photocopy this page and fill in the underscored fields from the worksheet utility screen.

WORKSHEET UTILITY

DISK 1 PARTITION MAP

Designation	Hard Partition	Mount Point	Size (M bytes)
-------------	----------------	-------------	----------------

a	Free		0
---	------	--	---

b	Free		0
---	------	--	---

c	Entire Disk		
---	-------------	--	--

d	Free		0
---	------	--	---

e	Free		0
---	------	--	---

f	Free		0
---	------	--	---

g	Unix	/usr2	_____
---	------	-------	-------

h	Free		0
---	------	--	---

Total Disk Space = _____

Determining Required Disk Space—worksheet Utility

Stand-alone Disk Partition Map—Disk 2, 3, 4, or 5

Photocopy this page once for each secondary disk on your system.

For each disk, circle the following:

- The number of the disk shown by this map
- The /usr directory of the disk

Fill in the underscored fields from the worksheet utility screen.

WORKSHEET UTILITY

DISK 2, 3, 4, 5 (circle one) PARTITION MAP

Designation	Hard Partition	Mount Point	Size (M bytes)
a	Free		0
b	Free		0
c	Entire Disk		
d	Free		0
e	Free		0
f	Free		0
g	Unix	/usr3, 4, 5, 6 (circle one) _____ _____ _____ _____	
h	Free		0

Total Disk Space = _____

File Server Disk Partition Maps

Photocopy this page and fill in the underscored fields from the worksheet utility screen.

File Server Disk Partition Map—Disk 0

WORKSHEET UTILITY

DISK 0 PARTITION MAP

Designation	Hard Partition	Mount Point	Size (M bytes)
-------------	----------------	-------------	----------------

a	Root		_____
---	------	--	-------

b	Swap		_____
---	------	--	-------

c	Entire Disk		_____
---	-------------	--	-------

d	Home Directories		_____
---	------------------	--	-------

e	Free or Pub (MC68010)		_____
---	-----------------------	--	-------

f	Pub (MC68020)		_____
---	---------------	--	-------

g	Free or Usr (MC68010)		_____
---	-----------------------	--	-------

h	Usr (MC68020)		_____
---	---------------	--	-------

Total Disk Space = _____

Press RETURN to continue:

Determining Required Disk Space—worksheet Utility

File Server Disk Partition Map—Disk 1

Photocopy this page and fill in the underscored fields from the worksheet utility screen.

WORKSHEET UTILITY

DISK 1 PARTITION MAP

Designation	Hard Partition	Mount Point	Size (M bytes)
a	ND (Clients)		_____
b	Free		0
c	Entire Disk		
d	Free		0
e	Free		0
f	Free		0
g	Unix	/usr2	_____

h	Free or Swap		_____
			Total Disk Space = _____

Press RETURN to continue:

File Server Disk Partition Map—Disk 2 or 3

Photocopy this page once for each secondary disk on your system.

For each disk, circle the following:

- The number of the disk shown by this map
- The /usr directory of the disk

Fill in the underscored fields from the worksheet utility screen.

WORKSHEET UTILITY

DISK 2, 3 (circle one) PARTITION MAP

Designation	Hard Partition	Mount Point	Size (M bytes)
a	Free or ND (Clients)		_____
b	Free		0
c	Entire Disk		
d	Free		0
e	Free		0
f	Free		0
g	Unix	/usr3,4 (circle one)	_____

h	Free or Swap		_____
			Total Disk Space = _____

Press RETURN to continue:

Determining Required Disk Space—worksheet Utility

File Server Client Partition Map—Client Maps

If your system has clients, the worksheet utility displays a map for each.

Photocopy this page once for each client. Fill in the underscored fields from worksheet utility screen.

The client map shown below is generic. It does not represent each individual client map. Photocopy one for each client that you have. The information for each client may be different. For example, a color client and a monochrome client will not have the same swap space.

WORKSHEET UTILITY

Client Partitions

Number of 68020 clients: _____

CPU type: MC68020
Root Disk: _____
Root Size: 6 M
Swap Disk: _____
Swap Size: _____

Number of 68010 clients: _____

CPU type: MC68010
Root Disk: _____
Root Size: 6 M
Swap Disk: _____
Swap Size: _____

Configuring and Loading the System—setup Utility

4

Configuring and Loading the System—setup Utility

4

The **setup** utility asks you for information on a series of displayed forms. You provide answers from the photocopied Disk Partition Maps that you filled in from the **worksheet** utility. When you execute **setup**, it defines disk partitions and extracts / (root), /pub, and /usr files from the tapes. When **setup** is finished, your system is fully configured and UNIX is running.

setup comes in two versions, a terminal (tty) interface and a window system (bit map) interface. If you are entering information on a alphanumeric terminal, you must use the terminal interface. If you are entering information on a workstation, you may use either version. Both interfaces have the same functions and gather the same information.

This section describes the window interface. If you choose to use the terminal interface, see Appendix G for instructions on moving the cursor.

For further information on how to use windows, see *Working with Windows* in the *CADDStation Systems User Guide*.

This section contains the following:

- An overview of how **setup** works
- Starting **setup**
- Using the window interface
- Filling in **setup** forms
- Executing **setup**

Using setup for Installation or Demonstration

The **setup** program can be used for installation or demonstration:

- **Software installation:** You use **setup** for installing new or upgrading CADDStation Systems software. You must have these items to begin:
 - The Disk Partition Map(s) produced by the **worksheet** utility
 - The Ethernet addresses of all diskless clients
 - Information about your hardware; types of disks, clients, terminals, etc.
 - The names of the software packages you are installing
- **Demonstration:** If you have full UNIX, you can use **setup** to test configurations without affecting the installation. If you are running a demonstration, do not select EXECUTE SETUP.

NOTE

You can edit the information on any form at any time; you can correct mistakes or experiment. When you have entered all the necessary **setup** information, you select EXECUTE SETUP, which begins the installation.

Configuring and Loading the System—setup Utility

Starting setup

Enter the **setup** command. Questions appear in menu format on your screen. Your answers determine which interface **setup** presents. Respond to the **>>** prompt with the requested information. If answers are numbered, respond with the corresponding number of the menu item.

setup

If you have not run the **worksheet** utility, the following question appears. Answer **y**. If you have run the **worksheet** utility, the question does not appear. If you have run the **worksheet** utility and want to run it again, remove the file **/tmp/worksheet.log** before entering the **setup** command.

```
Do you want to execute the Worksheet Utility before running
setup (y/n <CR>=y)
>>
```

setup asks if you are installing software or demonstrating **setup**. Answer **1**.

Enter the appropriate number response for the following questions.

Are you running Setup to:

- 1) Install a major Computervision UNIX release
- 2) Demonstrate Setup

>> 1

setup asks what kind of terminal you are using. Your answer determines whether you will use the window interface or the terminal interface.

If you want to use the mouse and mouse pad, enter **1** for the window interface.

If you do not have a mouse, enter **2** for the terminal interface. (The terminal interface can be used within a Shell Tool.)

Will you be running Setup from a:

- 1) Computervision bit mapped display device
- 2) cursor addressable terminal (TTY)

>> 1

If you select the **tty** interface, you are asked for your terminal type. If you select **Other**, the terminal name you provide must be described in the **/etc/termcap** file.

Select your terminal type:

(**setup** asks this if you selected **2** above.)

- 1) Televideo 925
- 2) Wyse Model 50
- 3) Computervision Workstation
- 4) Other

>> _____

Enter the terminal type (your terminal type must be in **/etc/termcap**):

>> _____

If you choose to use the terminal interface, see Appendix G for instructions on moving the cursor. Then return to this section for expanded definitions of the information requested.

Using the Window Interface

Figure 4-1 shows the Workstation form as an example of the window interface. The displayed sample is shown with some items already filled in.

Figure 4-1. Window Interface

The screenshot shows a window titled "WORKSTATION" with several tabs: "WORKSTATION" (selected), "DEFAULTS", "CLIENTS", "SOFTWARE", and "DISKS". There are three buttons: "Execute-setup", "Reboot", and "Quit".

Configuration options include:

- Workstation Name: []
- Workstation Type: File Server
- CPU Types Served: MC68010 CPU, MC68020 CPU
- 68010 UNIX Tape Set: Tape 1, Tapes 2
- UNIX Tape Set: 1/4 SCSI (st0), Remote
- Tape Device: []
- Tape Location: []
- Server Name: []
- Server Internet #: []
- Ethernet Interface: Sun Intel (le0)
- Host Number: 1
- Yellow Pages Type: Slave Server
- Domain: []
- Master Name: []
- Master Internet #: []
- Textfont: English
- Relabel Disk: Yes

Hardware diagrams include:

- XYLOGICS: A central box connected to two tape drives labeled xy0 and xy1.
- SCSI: A central box connected to two disk drives labeled sd0 and sd1.

You use both the keyboard and the mouse to enter answers.

The window interface displays two cursors: a blinking caret and an arrow. Keyboard input appears at the blinking caret; the mouse controls the arrow you use to select answers.

- **Blinking caret for keyboard input**—Figure 4-1 shows the caret positioned in the Workstation Name field. Any characters typed from the keyboard appear at the caret location.
- **Arrow for mouse input**—Move the mouse on its pad and note that the arrow cursor tracks your movements. To select an answer, position the mouse cursor over a box or an arrow circle and push one of two buttons:
 - The left mouse button checks a box or cycles through a list of answers
 - The right mouse button displays a popup menu at an arrow circle.

Table 4-1 shows how to enter information on the window interface.

Configuring and Loading the System—setup Utility

Table 4-1. Entering Information on the Window Interface

Item	Interaction
Boxes	A required text item is highlighted by a surrounding box. When you first start setup , the words Workstation Name are surrounded by a box indicating that you must supply input. (In Figure 4-1, the user selected a Tape Location of Remote. Server Name and Server Internet # are highlighted by boxes, showing that they must be filled in.)
Text	A blinking caret shows where keyboard input appears. Enter text and press RETURN . setup places the caret at the next text item to be filled in; you may also place the caret by clicking left mouse button over a text item. When typing, DEL erases character; CTRL-W erases a word; CTRL-U erases text in input field. If you type more characters than text field allows, characters scroll left, left arrow appears, and you cannot type any more characters. (In Figure 4-1, Workstation Name is a text item.)
Choice	Two semicircular arrows indicate a choice item. Use left mouse button to cycle through the options. To cycle backwards through choices, press SHIFT while using left mouse button. To see a popup menu of all available options, press the right mouse button. Hold right mouse button to view the menu. To select an answer, release right mouse button when the arrow is over your chosen answer (the answer is shown in reverse video). To select nothing, release button while cursor is outside menu. (In Figure 4-1, Workstation Type is a choice item.)
Toggle Item	A box indicates a toggle item. A check indicates the box is currently selected. You select a different setup form by clicking the left button in the box. Some toggle items can be clicked on or off by clicking the left button. Some toggle items are mutually exclusive. Other toggle items may be let you select more than one item at a time. In Figure 4-1, CPU-Types Served lets you select both MC68010 CPU and MC68020 CPU . (CPU-Types Served is only displayed when server is selected as the Workstation Type .)
Button	A button is a rounded rectangle. Examples are Execute-Setup and Quit at the top of the screen. To press a button, cover it with the mouse cursor and click the left mouse button. The button shows in reverse video until the invoked action is complete.
Scrolling Messages	The message region is the blank region below the buttons. To scroll a message, move mouse cursor into scroll bar on the left. Click left button to scroll up, right button to scroll down.

setup Forms

Table 4-2 lists and describes each of the five setup forms.

Table 4-2. setup Forms

Form	Information on Form
Workstation Form	Information about the system being configured.
Defaults Form	The default values of specified parameters such as network number and client autonumbering.
Software Form	Information about optional operating system software.
Disks Form	Information about hard partitions of each disk: root, swap, client partition.
Clients Form	(For servers only) Information about diskless clients: Ethernet address, root size, swap size.

Completing setup Forms

You will complete the forms in this order:

1. Workstation form
2. Defaults form
3. Disks form (if a server with clients on a secondary disk)
4. Client form (if a server with clients)
5. Software form
6. Disks form

If you are installing a server with clients on a secondary disk, you choose the Disks form as the third form. At that time, you only specify your client partition. Then you complete the Client form, the Software form, and return to the Disks form to complete the requested information.

Configuring and Loading the System—setup Utility

Workstation Form

When you enter the **setup** command, the Workstation form appears automatically. Table 4-3 describes Workstation form items in the order in which you should answer them. Figure 4-2 shows a Workstation form for a stand-alone and Figure 4-3 shows a Workstation form for a server. Boxes indicate required items. In the window interface, icons show the controller board(s) and disk(s) currently attached to the system.

Table 4-3. Workstation Form Items

Item	Procedure
Workstation Name	Enter name of your workstation here. This field is boxed to show that an answer is required. <i>You cannot proceed to another form until you provide a workstation name.</i> If on a network, be sure that no other machine in your domain has the same name as yours. <i>You may not use a pound sign, #, as a character in a workstation name.</i>
Workstation Type	Select stand-alone or server, as appropriate. If you select Type as Standalone, you are asked which disk you want your /usr files on.
/usr File System	Select the disk that is shown on your Disk Partition Map for /usr files. If you select Type as Server, you are asked whether or not you will be serving MC68010 clients:
CPU Types Served	Select CPU types served by your system. MC68020 CPU is selected by default (all servers have MC68020 CPUS). Check MC68010 CPU if the system is to serve MC68010 clients. If you check MC68010 CPU, you are asked for the number of UNIX tapes you will load for your MC68010 clients:
68010 UNIX	Select One Tape or Two Tape for 68010 clients. (Choose Three Tape only if you are loading Kanji—see Loading Kanji in Section 6.)
UNIX Tape Set	For 68020 server and 68020 clients. Select One Tape or Two Tape. (Choose Three Tape only if you are loading Kanji—see Loading Kanji in Section 6.)
Tape Device	Select type of tape drive you are using to read the system software tape.
Tape Location	Choose local or remote tape drive. If you select Tape Location as Remote, you are asked for the name and Internet address of the remote host:
Server Name	Enter name of the workstation whose tape drive you are using.
Server Internet Number	Enter Internet number of workstation whose tape drive you are using (for example, 192.9.200.48).

Table 4-3. Workstation Form Items (cont)

Item	Procedure
Ethernet Interface	<p>Selected for you if your machine has only one Ethernet interface. If your system has two Ethernet interfaces, select type of controller you are using. If you are not on a network, choose None.</p> <p>If an Ethernet interface is specified, you are asked for a host number and whether you want to use Yellow Pages. (See the <i>CADDStation Systems Network Guide</i> for information on Yellow Pages.)</p>
Host Number	<p>Assigned by setup by default (use Defaults Form to disable this feature). Host number must be unique across entire network. The host number is fourth number of the system's Internet address. If a system's Internet address is 192.9.200.48, this network number is 192.9.200 and the host number is 48.</p>
Yellow Pages Type	<p>If you select None, no further yp questions are asked.</p> <p>An answer of Master Server, Client, or Slave Server requires a yp Domain name.</p>
Domain	<p>Enter yp domain name.</p> <p>An answer of Slave Server also requires a Master Name and the Master Internet #.</p>
Master Name	<p>Enter name of machine that will be your yp master.</p>
Master Internet	<p>Enter Internet address of machine that will be your yp master (such as, # 192.9.200.48).</p>
Textfont	<p>If you are running Kanji, select Japanese; otherwise select English.</p>
Relabel Disk	<p>Choose YES, which is set by default. Choose NO to have setup leave the existing partitions on the disk intact, only if you are upgrading to a new version of UNIX and know that your disks are already correctly partitioned.</p>

Configuring and Loading the System—setup Utility

Workstation Form for a Stand-alone

Figure 4-2 shows an example of a workstation form for a stand-alone system. See Table 4-3 for further explanations of requested information.

Enter the following in your Workstation form for a stand-alone system:

1. Workstation name
2. Workstation type: Select Stand-alone
3. UNIX tape set: Select one or two UNIX tapes as appropriate.
4. Tape device: Select your type of tape drive.
5. Tape location: Select Local or Remote as appropriate.
6. Host Number
7. Yellow Pages information, if appropriate
8. Relabel disk: Select Yes

Figure 4-2. Workstation Form for a Stand-alone

■ WORKSTATION DEFAULTS CLIENTS SOFTWARE DISKS

Message Window

Workstation Name:

Workstation Type: Standalone

/usr File System: First Disk

UNIX Tape Set: Tapes 2

Tape Device: 1/4" SCSI (st0)

Tape Location: Local

Ethernet Interface: Sun Intel (le0)

Host Number: 1

Yellow Pages Type: None

Textfont: English

Relabel Disk: Yes

SCSI

sd0 sd1

WARNING If you select /usr to be on the second disk, do not manually change /usr on the Disks form.

Select the Defaults form next.

Workstation Form for a Server

Figure 4-3 shows an example of a workstation form for a server. See Table 4-3 for further explanations of requested information.

Enter the following in your Workstation menu:

1. Workstation name
2. Workstation Type: Select **File Server**.
3. CPUs Types Served: You must select MC68020 for the server. Also select MC68010 if you have 68010 clients.
4. 68010 UNIX type if required: Select one or two UNIX tapes for 68010 clients
5. UNIX tape set: Select one or two UNIX tapes for 68020 machine
6. Tape device: Select the your type of tape drive.
7. Tape Location: Select **Local** or **Remote** as appropriate.
8. Host Number
9. Yellow Pages information, if appropriate
10. Relabel disk: Select **Yes**.

Figure 4-3. Workstation Form for a Server

■ WORKSTATION □ DEFAULTS □ CLIENTS □ SOFTWARE □ DISKS Execute-setup Reboot Quit

Workstation Name: ^

Workstation Type: File Server

Ethernet interface: Sun Intel (le0)

Host Number: 1

CPU Types Served:

MC68010 CPU

MC68020 CPU

Yellow Pages Type: Master Server

Domain: []

68010 UNIX Tape Set: Tape 1

UNIX Tape Set: Tapes 2

Tape Device: 1/4 SCSI (st0)

Textfont: English

Tape Location: Local

Relabel Disk Yes

xy0 xy1

Select the Defaults form next.

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Defaults Form

Use the Defaults form (Figure 4-4) to change the default values of setup variables used in the installation. Table 4-4 describes information on the Defaults form.

Figure 4-4. Defaults Form

Message Window

WORKSTATION DEFAULTS CLIENTS SOFTWARE DISKS

Network Number: 192.9.200
Auto Host Numbering: Yes
Begin Numbering at: 1
Display Units: M Bytes
Mail Configuration: Mail Client
Preserve Disk State: No
Install root Files Only: No

Table 4-4. Defaults Form Items

Item	Procedure
Network Number	Enter a network number to identify the network for the current system. Form displays default network address: 192.9.200. Use this default number if you are setting up the first network at your site. If you have networks already set up at your site, use a network number previously assigned to you.
Auto Host Numbering	Each workstation on a network is identified with a host number. Host numbers can range from 1 to 255. Auto Host Numbering is Yes by default. If you leave this item on, setup automatically assigns host numbers for each workstation you configure. Checking the No option disables this feature.
Begin Numbering at	Specify the first host number to be assigned when Auto Host Numbering is Yes. If you are adding systems to an existing network, specify the next available number for the specified network.
Display Units	Select units that memory sizes are displayed in. Default is Megabytes; you may select Kilobytes, Cylinders, or Sectors.
Mail Configuration	Specify workstation to act as a Server or Client of the mail system.

Table 4-4. Defaults Form Items (cont)

Item	Procedure
Preserve Disk State	By default, set to No. Set this to Yes only if you have previously configured your disks with setup and do not wish to change your disk configuration. (If you set this to Yes, then be sure that you set Relabel Disk to No on the Workstation form; the Relabel Disk item overrides Preserve Disk State.)
Install root Files Only	Set this to Yes if you are planning to run UNIX on this system using NFS. See Creating an NFS Client in Appendix H.

Clients Form

The Clients form (Figure 4-5) requests information about your diskless clients. Refer to the Disk Partition Maps for your clients.

NOTE

If the Network Disk (ND) client partition is on any disk but disk 0 (on a secondary disk), you must select the Disks form next. You must put the ND partition in place before you fill in the Clients form. On the Disk form for that disk, say disk 1, make partition a Type: ND. *Do not make any other changes on the Disks form at this time. Return to this point.*

There are four regions of the client form:

- The list of default client cards in the top right quadrant
- The client editor in the bottom left quadrant
- The configuration card editor in the bottom right quadrant
- As you add clients, their names are displayed in the top left quadrant

Before completing this form, be sure you have Ethernet addresses for all clients.

1. Select a default configuration card from the top right portion of the screen. (Default client cards are selected like buttons—with your mouse cursor on the client card, click the left button.) The example in Figure 4-5 shows that the default client card, CL/20M (for a 68020 monochrome client), was selected.
2. Fill in the appropriate information for your 68020 clients: CPU Type, Root Partition, Root Size, Swap Partition, and Swap Size.
3. Select the Make Default button to make this card your chosen default.
4. Select the Close button.

To apply this default card to each 68020 diskless client, follow these steps:

1. In the lower left quadrant, enter a client name after the Edit Client field and press RETURN.
2. A set of fields appear with the default information already filled in. Add the client's unique Ethernet address.

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3. Select the CLOSE button to apply these characteristics to the client.
4. Your new client's name appears in the upper left. To edit this client again, you can select it from this region.

Use or modify this procedure as appropriate for each client.

Figure 4-5. Clients Form

Table 4-5. Clients Form Items

Item	Procedure
------	-----------

Upper Left

Icons All existing clients are displayed with an icon and name. These can be selected for editing. Any values showing in the lower right quadrant can be applied to any of these clients.

Upper Right

Template Cards These can be selected and modified to be used as a default for your clients. Select a card with the left button. It appears in the lower right, ready to be edited.

Table 4-5. Clients Form Items (cont)

Item	Procedure
Lower Right	
Don't Apply	Selecting Don't Apply for any field below means that if you enter a client name after the Apply To field, this field remains unchanged for that client.
Edit Card	Enter a template card name. Enter a name to create your own template card.
CPU type	Choose CPU type of the client. If you plan to apply this card to an existing client, select DON'T APPLY to leave a client's CPU type unaffected.
root Partition	Choose hard partition client's root partition. The default is First Fit, which places root on client's first ND partition with sufficient space. Choose default; designate a specific ND partition; or select DON'T APPLY (to keep clients' same root partitions).
root Size	Enter size of client's root disk. Current Display Units are assumed. You may change these on the Defaults form.
Swap Partition	Choose hard partition for client's swap partition. The default is First Fit. Choose default; designate a specific ND partition; or select DON'T APPLY (to keep clients' same swap partitions).
Swap Size	Enter swap size of the disk.
3COM Board	Check Yes if client is using a 3COM Ethernet board.
Apply To	Enter name of an existing client. The values currently showing are automatically applied to this client, except for fields marked DON'T APPLY.
Close	Select to close current card.
Delete	Select to delete current card.
Make Default	Select this button to make the displayed card the default card for repeated use.
Lower Left:	
Default Card	If a default card was selected with Make Default, its name is displayed here. If not, you can enter name of an existing configuration card to make it the current default card. To clear the default, erase the name and press RETURN.
Edit Client	Enter client name and press RETURN. If client does not exist, setup creates a new one. If a Default Card exists, setup uses its default values for the newly created client and you need only enter the client's Ethernet address. If client exists, its attributes are displayed and can be modified. See the Disk Partition Maps for root and swap size. Client properties are the same as those described in Lower Right.
Name	Complete when you first start editing a client. If you change client name but keep other attributes (e.g., its Ethernet address), erase old name and type in new one.
Ethernet Address	Enter client's Ethernet address. (If you did not record addresses earlier, power on each client to find them (see Halting Systems in Section 1). It is a 6-byte hexadecimal value, each byte separated by a colon (e.g., 8:0:1:0:14:76). Store Ethernet addresses in your logbook.
Host Number	Enter client's Internet host number. If Auto Host Numbering is on, setup assigns a host number to the client; if not, enter an explicit host number.

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Software Form

On the Software form, select the optional UNIX software packages that you want to load. Figure 4-6 shows the optional choices on the first UNIX tape. Table 1-1 lists the available options for both UNIX tapes. Check off the packages you want. The selections ALL and COMMON CHOICES give you an alternate method of selecting packages. If you are configuring a server of both 68010 and 68020 clients, you must repeat the process for each architecture.

Select the following if they apply to you:

1. You must select Kernel Configuration Files from the list.
2. If you are loading CADDs, select COMMON CHOICES in the window interface. Add additional packages if you wish. If you are loading Kanji, see Loading Kanji in Section 6.
3. If you have an Epson printer, select Graphics Hardcopy.
4. If you are on a network, select Networking tools and programs.
5. If you have Item 4017, Programmable Netlister Library, you must check off Programming tools on the list.
6. If you are setting up a diskful workstation to run most of UNIX using NFS from another system, do not select any optional software—see Appendix H, Creating a Diskful NFS Client.

Figure 4-6. Software Form

Optional Software For:	Package Name	Size
<input checked="" type="radio"/> MC68020 CPU	<input type="checkbox"/> CADDs Relink Option	(0.71M)
<input type="checkbox"/> Clear	<input type="checkbox"/> UIM Programs	(1.27M)
<input type="checkbox"/> All	<input type="checkbox"/> Paper Punch Tape Reader	(0.05M)
<input type="checkbox"/> Common Choices	<input type="checkbox"/> Graphics Hardcopy	(0.39M)
	<input type="checkbox"/> Network Administration Tool	(0.86M)
	<input type="checkbox"/> Networking tools and programs	(2.19M)
	<input type="checkbox"/> Sun Online Diagnostics	(2.01M)
	<input type="checkbox"/> Kernel Configuration Files	(2.01M)

Each package is listed with its default size. As you select a software package, the size of the /usr partition is automatically adjusted by decreasing the size of the Swap partition.

If there is not enough space to install all the packages you request, setup selects as many as possible and notifies you with a message for any options it does not have room for.

Disks Form

The Disks form shows you all the disks connected to the system you are configuring and allows you to individually edit their hard partitions. Refer to your Disk Partition Map for the correct size and placement of partitions.

Table 4-6 lists the items and entries on the Disks form. Figure 4-7 through Figure 4-11 show samples of Disks forms.

Always fill out the Software and Clients (if applicable) forms before filling in the Disks Form. Choices you make on the Software and Clients forms alter disk partition sizes on the Disks form. Therefore, you want to complete the Disks form last to ensure that all partition sizes are adequate.

The only exception to this applies to servers with the ND partition for clients on a secondary disk. In this case, you identified your ND partition on the Disks form before completing the Software and Clients form and are now returning to the Disks form to complete other information.

NOTE **setup** prevents you from setting swap and root partition sizes below the displayed sizes:

You cannot modify root size from **setup**. If you need a larger root partition, you must configure it from **prepdisk** by creating a custom disk label before running **setup**.

You can modify the swap partition from **setup** only to make it larger than you made it during **prepdisk**; you cannot make it smaller than its initial size.

Configuring and Loading the System—setup Utility

Table 4-6. Disks Form Items

Item	Procedure
Upper Left and Middle	
Edit Disk	Initially None. All your system's disks show at the top of the display. To select a disk, click the left button over it or select it by cycling through the choices. This action opens the disk for edit. The disk's total size and amount of free space show below its name. On the lower left screen, the form lists the type and initial size of each of partitions a through h. On the right is a graphic display of the relative positions and sizes of the partitions. Total size and amount of free space remaining on the disk is shown in the upper left. (Several items on upper right alter disk parameters.)
Upper Right	
Round to Cylinders	Always leave this set to Yes. Any partition size you enter will be automatically rounded to the next cylinder boundary.
Overlapping Allowed	Always leave this set to No. Overlapping partitions is not recommended.
Float	Always leave this set to Yes. When overlapping is not allowed, disk partitions must be allowed to find necessary space or give up unneeded space (<i>float</i>) if as other partition sizes change.
Free Space Hog	Identifies the partition that holds all available free space after setup is executed. (A free space partition only works as long as the disk partitions are being floated.) Set this according to your Disk Partition Map. The current Free Space Hog, if any, is highlighted in the partition display.
Lower Middle — Fields shown selectively according to partition	
Edit Hard Partition	Initially None. Select a partition to edit with the left button in the arrow circle.
Offset	Displays partition's offset in current display units. Do not change this field.
Size	Displays partition's size in the current display units. You change this value according to the Disk Partition Map.
Type	Specify type of partition (for selected partitions) from among Free, root, swap, ND, and UNIX. /usr or any applications are in UNIX.
Mount Point	Specify file system mount point for partitions of type UNIX. The default is /usr. If the map shows the mount point as /usr2, /usr3, and so on, you must specify the mount point.
Move To	For selected UNIX soft partitions (such as /pub), this provides the option to move this designation to a different hard partition. Select destination partition by cycling through To:. The new partition must be Free and must already have enough space allocated or be able to float to the appropriate size to accommodate the move.
Move It	Commits move once you select destination.
Graphics Bar	Shows the current size of the partition. You can change the size with this bar and the right button, but your control is not as exact as entering a number.

Disks Form for a Stand-alone

The following are sample Disks forms for disks 0 and 1 on a stand-alone system. Only items that may need changing are displayed.

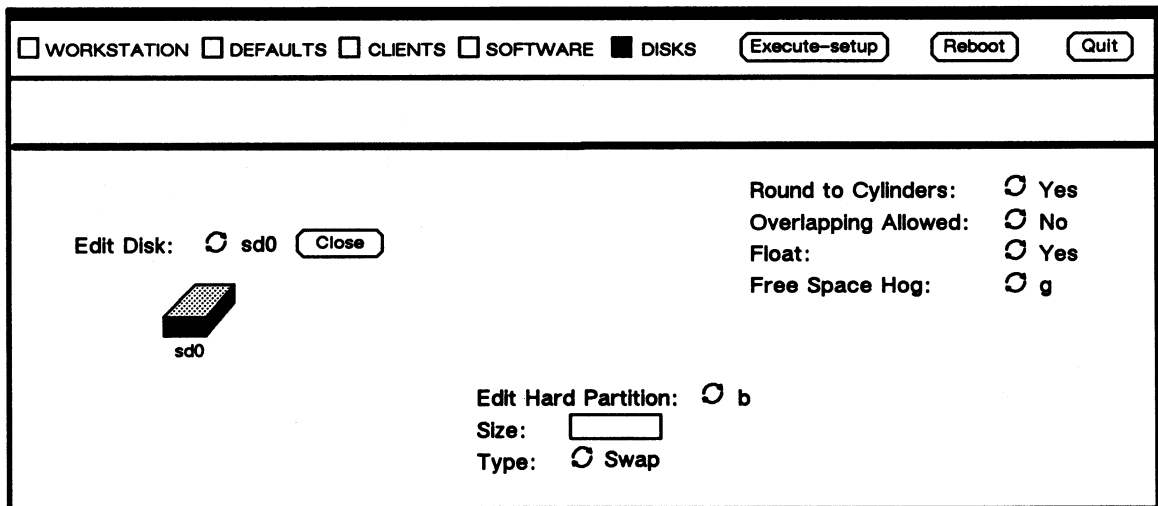
Stand-alone Disk 0 Menu

Figure 4-7 shows only the portions of the display that you need to modify on disk 0 for a stand-alone.

1. Select disk 0 (**sd0**).
2. Edit partition **b** to Type: **Swap** and the size according to your Disk Partition Map.


Remaining space is used for **/usr**.

Figure 4-7. Disk 0 Form for a Stand-alone



WORKSTATION DEFAULTS CLIENTS SOFTWARE DISKS

Edit Disk: sd0


sd0

Round to Cylinders: Yes
Overlapping Allowed: No
Float: Yes
Free Space Hog: g

Edit Hard Partition: b
Size:
Type: Swap

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Stand-alone Disk 1 Menu

Figure 4-8 shows only the portions of the display that need to modify on disk 1 for a stand-alone.


NOTE If you placed /usr on the second disk when in the Workstation form and have not yet executed **setup**, you do not see the change when in the Disks form. **setup** still shows /usr on disk 0. Do not enter the change again. When you execute **setup**, the change occurs.

1. Select disk 1 (sd1).
2. Using the right mouse button and the popup menu, make partition g the free space hog.
3. Edit partition g to Type: UNIX and Mount Point: /usr2
4. If the disk 1 swap is not zero, edit partition h to Type: Swap and make its size reflect the size from your Disk Partition Map.

Figure 4-8. Disk 1 Form for a Stand-alone

WORKSTATION DEFAULTS CLIENTS SOFTWARE DISKS

Edit Disk: sd1


sd1

Round to Cylinders: Yes
Overlapping Allowed: No
Float: Yes
Free Space Hog: g

Edit Hard Partition: g
Type: UNIX
Mount Point: /usr2

Disks Form for a Server

Following are sample Disks forms for disks 0 and 1 on a CADDServer. Only items that may need changing are displayed. In the list of hard partitions, partitions for both 68010 and 68020 clients are displayed. If your server has no 68010 clients, then partitions e and g will be of Type: Free and Size: 0.

As you selected optional software on the Software form, the partition sizes changed according to the software you picked.

Server Disk 0 Menu


Figure 4-9 shows only the portions of the display that need to modify on disk 0 for a server.

1. Select disk 0 (xy0 or sd0, as appropriate).
2. Edit partition b to Type: Swap and the size according to your Disk Partition Map.
3. Edit partition f to Size: 8.0. (If you are loading a tapeless workstation, set the size of partition f to 13.0.)
4. Edit the Pub (MC68020) partition to the size on the Disk Partition Map. (Never make it smaller than the size initially displayed.)
5. If you have 68010 clients, edit the Pub (MC68010) partition to the size on the Disk Partition Map. (Never make it smaller than the size initially displayed.)

Figure 4-9. Disk 0 Form for a Server

WORKSTATION DEFAULTS CLIENTS SOFTWARE DISKS

Edit Disk: xy0


xy0

Round to Cylinders: Yes
Overlapping Allowed: No
Float: Yes
Free Space Hog: d

Edit Hard Partition: b
Offset: 8.63M
Size:
Type: Swap

Configuring and Loading the System—setup Utility

Server Disk 1 Form

Figure 4-10 shows only the portions of the display that need to modify on disk 1 for a server.

NOTE If you placed `/usr` on the second disk when in the Workstation form and have not yet executed `setup`, you do not see the change when in the Disks form. `setup` still shows `/usr` on disk 0. Do not enter the change again. When you execute `setup`, the change occurs.


1. Select disk 1 (`xy1`).
2. Using the right mouse button and the popup menu, make partition `g` the Free Space hog.
3. Edit partition `g` to be Type: `UNIX` and Mount Point: `/usr2`
4. If the disk 1 swap is not zero, edit partition `h` to Type: `Swap` and the size from your Disk Partition Map.

If clients will reside on disk 1, you already made partition `a` Type: `ND`

Figure 4-10. Disk 1 Form for a Server

WORKSTATION DEFAULTS CLIENTS SOFTWARE DISKS

Edit Disk: xy1


xy1

Round to Cylinders: Yes
Overlapping Allowed: No
Float: Yes
Free Space Hog: g

Edit Hard Partition: g
Type: UNIX
Mount Point: `/usr2`

Server Disk 2 Form or Additional Disks

Figure 4-11 shows only the portions of the display that need to modify on disk 1 for a server.

1. Select disk 2 (xy2).
2. Using the right mouse button, make partition g the Free Space hog.
3. Edit partition g to Type: UNIX and Mount Point: /usr3
4. If the drive 2 swap is not zero, edit partition h to be Type: Swap and the size from your Disk Partition Map.

NOTE If you have a disk that is dedicated to swap, you must have either an a partition or a g partition with at least 0.06MB of space before the h partition. Failure to do so can erase the label of your secondary disk.

Use this procedure to edit any additional disks by selecting the disk and making the mount point /usr4 or /usr5 as appropriate.

Figure 4-11. Disk 2 Form for a Server

The screenshot shows a window titled "Execute-setup" with buttons for "Reboot" and "Quit". The window content is as follows:

At the top, there are checkboxes for "WORKSTATION", "DEFAULTS", "CLIENTS", "SOFTWARE", and "DISKS" (which is selected). Below this, there are three radio buttons for disk selection: "xy2" (selected), "Close", and "Close".

Below the radio buttons is a small icon of a hard drive labeled "xy2".

To the right of the disk selection area, there are four radio button options:

- Round to Cylinders: Yes
- Overlapping Allowed: No
- Float: Yes
- Free Space Hog: g

Below these options, there are three radio buttons for partition selection: "g" (selected), "Type: UNIX", and "Mount Point: /usr3".

Configuring and Loading the System—setup Utility

Executing setup

To execute **setup**, press the EXECUTE SETUP button on the last form you complete. **setup** begins installing UNIX on your workstation, completing these steps as it executes:

1. **setup** checks if any information is missing. If it is, **setup** prints a message and returns you to your appropriate interface. Complete the missing information and hit EXECUTE-SETUP again. If nothing is missing, **setup** begins installation process.
2. During installation, **setup** messages tell you where it is in the process. When **setup** tells you to mount another tape, do so, then press RETURN.
3. **setup** writes a new label on each disk, defining size and location of hard partitions (if Relabel Disk = Yes). It makes a file system on each hard partition that is to be a UNIX file system.
4. **setup** updates system files, printing a message as `/etc/hosts`, `/etc/nd.local`, and `/etc/ethers` are updated. Only `/etc/hosts` is updated for CADDStation.
5. **setup** extracts required `root` and `/pub` files (5 to 10 minutes each), initializes clients (if a server,) then extracts `/usr` files (about 30 minutes) from the tapes.
6. (For servers only) **setup** initializes clients. For each client, it makes a file system on its root ND partition, initializing the first client's root partition from tape and subsequent clients' root partitions via disk to disk copies from the first client (5 minutes per client).
7. **setup** extracts optional software application files from tapes. (Time varies depending on software groups chosen and size of chosen groups.)
8. **setup** installs Yellow Pages.

The screen displays the following messages as **setup** executes: (The order of mounting tapes for Kanji differs from this example. Follow the instructions shown below.)

```
Beginning the installation
Labeling the disks
Making a file system for '/'
Making a file system for '/usr2'
Making a file system for '/usr'
Extracting more root files

Please mount tape 2 for architecture 'MC68020'
Press Return to continue. RETURN

Extracting the usr files
Extracting 'Sys'
Extracting 'Sunwindows Programs and Libraries'

Installation complete
```

-
9. When the screen displays **Installation complete**, remove the tape from your drive. Select the **REBOOT** button on the form to boot your system.
 10. At the **login:** prompt, type **root** to log in under the user name **root**, also called *superuser*.

You must reconfigure your kernel. Section 5, **Reconfiguring the UNIX Kernel**, contains instructions for reconfiguring the kernel.

If you want to load utilities from the Platform Application tapes, follow procedures in Section 7, **Installing Applications**. For a list of utilities on the Platform Application tapes, see the `/usr/license/data/mod_des` file.

Testing Clients

Before proceeding, check that your server and your clients are communicating. Turn on each client. It should boot automatically.

Setting Up the Network

To enable network communication among systems, the following files must be on each system:

```
/etc/hosts
/etc/hosts.equiv
.rhosts
```

The `/etc/hosts` file contains addresses and names for all systems on your network. The `setup` utility created this file for you. (If you are upgrading to a new release of software, merge your old `/etc/hosts` file with this new one.)

If you are setting up a server with clients, the `/etc/hosts.equiv` file on each of these systems must contain the names of every other system. To enable you to remotely log into any client as **root**, your server's system name must be in the client's `.rhosts` file. So that you can log into any remote system from any other system as **root**, have all systems in each other's `.rhosts` file.

The format of both the `/etc/hosts.equiv` and the `.rhosts` file each contains a list of system names as shown below.

```
# more /.rhost
ariel
hamlet
falstaff
```

Refer to *Setting Up and Managing the Network* in the *CADDStation Systems Network Guide* for more information on these files.

You need two additional network files to be able to transfer licenses from one system to another under LMS. See the *Installing and Using the License Management System* for instructions on setting up the `/etc/hosts.lm_authorize_systems` and the `/etc/hosts.lm_search_systems` files.

Reconfiguring the UNIX Kernel

5

The UNIX kernel consists of the system internals that enable software-to-hardware communication and manage computer memory. UNIX allows you to tailor your system by configuring your system kernel.

For this release of the UNIX operating system, you *must* reconfigure the kernel on each system on which you install software. Reconfigure the kernel on each server, on each stand-alone, and on each diskful client. On a server with clients, you also reconfigure a kernel for the `/pub` partition used by all diskless clients.

NOTE To reconfigure your kernel, you must select *Kernel Configuration Files* when you choose optional software. If you did not, you can add the necessary utilities to your system by loading the UNIX Tape #1. Type the following command. Instructions are displayed.

```
# /usr/etc/extract_release
```

By default, UNIX uses the configuration file `/usr/sys/conf/GENERIC` to create the kernel. The compiled kernel lives in the root directory and is called `/vmunix`.

NOTE *Never* delete the `/usr/sys/conf/GENERIC` file or the original `/vmunix`. You may need to use these again if your new configuration fails.

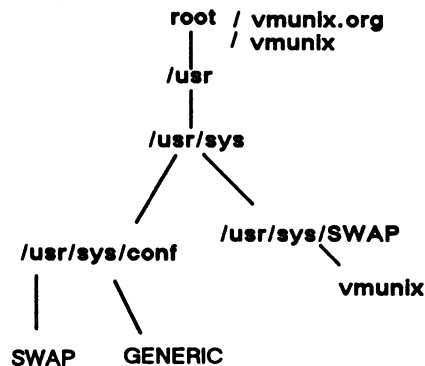
To reconfigure the kernel, you will copy the `/usr/sys/conf/GENERIC` file, rename it, edit it, run the `/etc/config` command on this new file, and boot the system with the new kernel. Specific instructions are listed below.

For more information see `/usr/sys/conf/README.first`, `/usr/sys/conf/README`, and the `config(8)` command in the UNIX command reference.

Figure 5-1 shows the location of the configuration files referenced in the instructions for multiple swap systems.

Reconfiguring the UNIX Kernel

Figure 5-1. System Location of Configuration Files



Reconfiguring the Kernel for Multiple Disk Swap

If you have swap on more than one disk, follow these instructions to reconfigure the kernel on a server or stand-alone system.

1. Select a name for your new configuration file in UPPERCASE letters. This example uses the name SWAP. Copy the GENERIC file to the new file name. Add write permission to your new file. Open the file for editing with the vi editor.

```
# cd /usr/sys/conf
# cp GENERIC SWAP
# chmod +w SWAP
# vi SWAP
```

2. Change the line ident GENERIC to ident SWAP
3. If you do not live in the Eastern Time Zone, change the 5 in the timezone line to the number for your time zone. Central is zone 6; Mountain is zone 7; Pacific is zone 8.
4. The variable maxusers is set to 10, which is sufficient for most applications. If you need to increase maxusers beyond 10, change this value.
5. Change config vmunix swap generic to identify the locations of your root partition and your swap partitions. For Xylogics disks, use xynn; for SCSI disks, use sdnn, where nn is the disk drive and partition number; for example, sd3h.

```
config vmunix root on sd0a swap on sd0b and sdnn
```

6. Turn to Commenting Out Excess Devices and follow the directions.
7. Write to the disk and quit from the file.

-
8. Now remove write permission from your new file, run the `/etc/config` command on the new file, change to the new `/usr/sys/SWAP` directory, then run the `make` command.

```
# chmod -w SWAP
# /etc/config SWAP
# cd ../SWAP
# make
```

Ignore any warning messages about vectored interrupts for `zs2` and `zs3`. If you see the error message Error Code 1, Stop, discontinue this procedure. You must return to your new configuration file, change its contents, and redo `/etc/config`. Particularly check the information in the Commenting Out Excess Devices subsection.

9. The file `/vmunix` is the UNIX kernel that is used each time your system boots. You *must* save this file in case your new kernel does not work. Copy `/vmunix` to a safe location in the root partition, `/vmunix.orig`. Then copy the `/usr/sys/SWAP/vmunix` file to `/vmunix`.

```
# cp /vmunix /vmunix.orig
# cp vmunix /vmunix
```

10. For each partition on which you have additional swap, add a line in one of the following formats to the end of the `/etc/fstab` file using the `vi` editor, where `nn` is the drive and partition number of extra swap. You do not need to add lines for swap on `xy0b` or `sd0b`; these are already assumed to be swap.

```
If you have an sd disk, add /dev/sdnn abc swap abc 0 0
If you have an xy disk, add /dev/xynn abc swap abc 0 0
```

11. Reboot as follows:

```
# /etc/reboot
```


Reconfiguring the UNIX Kernel

Reconfiguring the Kernel for Diskless Clients

If you are running diskless clients, follow these steps on the server to create a /pub configuration file.

1. Select a name for your new configuration file in UPPERCASE letters. This example uses the name CLIENT. Copy the GENERIC file to the new file name. Add write permission to your new file. Open the file for editing with the vi editor.

```
# cd /usr/sys/conf
# cp GENERIC CLIENT
# chmod +w CLIENT
# vi CLIENT
```

2. Change the line ident GENERIC to ident CLIENT
3. If you do not live in the Eastern Time Zone, change the 5 in the timezone line to the number for your time zone. Central is zone 6; Mountain is zone 7; Pacific is zone 8.
4. Turn to Commenting Out Excess Devices and follow the directions.
5. Write to the disk and quit from the file.
6. Now remove write permission from your new file, run the /etc/config command on the new file, change to the new /usr/sys/CLIENT directory, then run the make command.

```
# chmod -w CLIENT
# /etc/config CLIENT
# cd ../CLIENT
# make
```

Ignore any warning messages about vectored interrupts for zs2 and zs3. If you see the error message Error Code 1, Stop, discontinue this procedure. You must return to your new configuration file, change its contents, and redo /etc/config. Particularly check the information in the Commenting Out Excess Devices subsection.

7. The file /pub.MC68020/vmunix is the UNIX kernel that is used each time your system boots. You *must* save this file in case your new kernel does not work. Copy the /pub.MC68020/vmunix file to a safe location in the root partition, here /pub.MC68020/vmunix.client. Then copy the /usr/sys/CLIENT/vmunix file to /pub.MC68020/vmunix.

(For a 68010 client, the vmunix file would be in the /pub.MC68010 directory.)

```
# cp /pub.MC68020/vmunix /vmunix.client
# cp vmunix /pub.MC68020/vmunix
```

8. Reboot the server, then each client, as follows:

```
# /etc/reboot
```

Reconfiguring the Kernel for Other Systems

If you have stand-alones, servers, or diskful clients that *do not have swap on more than one disk*, follow these steps to create a new kernel.

1. Select a name for your new configuration file in UPPERCASE letters. This example uses the name GEMINI (for a system named **gemini**). Copy the GENERIC file to the new file name. Add write permission to your new file. Open the file for editing with the vi editor.

```
# cd /usr/sys/conf
# cp GENERIC GEMINI
# chmod +w GEMINI
# vi GEMINI
```

2. Change the line **ident GENERIC** to **ident GEMINI**
3. If you do not live in the Eastern Time Zone, change the 5 in the **timezone** line to the number for your time zone. Central time is zone 6, Mountain time is zone 7, and Pacific time is zone 8.
4. Turn to **Commenting Out Excess Devices** and follow the directions.
5. Write to the disk and quit from the file.
6. Now remove write permission from your new file, run the **/etc/config** command on the new file, change to the new **/usr/sys/GEMINI** directory, then run the **make** command.

```
# chmod -w GEMINI
# /etc/config GEMINI
# cd ../GEMINI
# make
```

Ignore any warning messages about vectored interrupts for zs2 and zs3. If you see the error message **Error Code 1, Stop**, discontinue this procedure. You must return to your new configuration file, change its contents, and redo **/etc/config**. Particularly check the information in the **Commenting Out Excess Devices** subsection.

7. The file **/vmunix** is the UNIX kernel that is used each time your system boots. You *must* save this file in case your new kernel does not work. Copy the **/vmunix** file to a safe location in the root partition, **/vmunix.orig**. Then copy the **/usr/sys/GEMINI/vmunix** file to **/vmunix**.

```
# cp /vmunix /vmunix.orig
# cp vmunix /vmunix
```

8. Reboot the system, as follows:

```
# /etc/reboot
```

Reconfiguring the UNIX Kernel

Commenting Out Excess Devices

The `GENERIC` file contains entries for all supported devices. You must comment out devices from the file that your system does not use. To *comment out* something from a file means to place a pound sign, `#`, in the first position in the file. The system then interprets that line as a *comment* and does not execute it. See the `/usr/sys/conf/README.first` file for on-line help.

xy Xylogics controller & disks

If you do not have any SMD disks (300MB, 515MB, or 1GB disks), comment out the following lines. If you do have an SMD disk, comment out the excess disk numbers; that is, if you have two drives, leave in `xy0` and `xy1`; comment out the line for `xy3`.

```
#controller    xyc0 at vme16d16 ? csr 0xee40 priority 2 vector xyintr 0x48
#controller    xyc1 at vme16d16 ? csr 0xee48 priority 2 vector xyintr 0x49
#
#disk          xy0 at xyc0 drive 0 flags 0x1
#disk          xy1 at xyc0 drive 1 flags 0x1
#disk          xy2 at xyc0 drive 2 flags 0x1
#disk          xy3 at xyc0 drive 3 flags 0x1
#
```

sc SCSI controller and units

If you do not have any SCSI disks (50MB, 85MB, 170MB disks), comment out the following lines. If you do have a SCSI controller, comment out the excess disk numbers; that is, if you have two drives, leave in `sd0` and `sd1`; comment out the lines for `sd2`, `sd3`, `sd4`, and `sd5`.

```
#
#controller    sc0 at vme24d16 ? csr 0x200000 priority 2 vector scintr 0x40
#
#              SCSI disks
#
#disk          sd0 at sc0 drive 0 flags 0
#disk          sd1 at sc0 drive 8 flags 0
#
#disk          sd2 at sc0 drive 16 flags 0
#disk          sd3 at sc0 drive 24 flags 0
#
#disk          sd4 at sc0 drive 40 flags 0
#disk          sd5 at sc0 drive 41 flags 0
#
#
#tape          st0 at sc0 drive 32 flags 1
#
```

si SCSI controller and units

If you do not have any si SCSI disks (Models 30 and 33 only), comment out the following lines:

```
#controller    si0 at vme24d16 ? csr 0x200000 priority 2 vector siintr 0x40
#controller    si0 at obio ? csr 0x140000 priority 2

#              SCSI disks - on the onboard SCSI chip
```

```
#disk      sd0 at si0 drive 0 flags 0
#disk      sd1 at si0 drive 8 flags 0
#
#disk      sd2 at si0 drive 16 flags 0
#disk      sd3 at si0 drive 24 flags 0
#
#disk      sd4 at si0 drive 40 flags 0
#disk      sd5 at si0 drive 41 flags 0
#
#tape      st0 at si0 drive 32 flags 1
#disk      sf0 at si0 drive 8 flags 2
```

se SCSI controller and units

If you do not have any se SCSI disks, comment out the following lines:

```
#controller  se0 at vme24d16 ? csr 0x300000 priority 2 vector se_intr 0x40
#disk        sd0 at se0 drive 0 flags 0
#disk        sd1 at se0 drive 1 flags 0
#disk        sd2 at se0 drive 8 flags 0
#disk        sd3 at se0 drive 9 flags 0
#tape        st0 at se0 drive 32 flags 1
#tape        st1 at se0 drive 40 flags 1
```

Graphics Accelerator

If you do not have a GPU board, comment out the following line:

```
device  cvgpu0 at vme24d16 ? csr 0xdb0000 priority 3 vector cvgpuint 0xca
```

If you do not have a GAB, comment out the following line:

```
device  cvgab0 at vme32d32 ? csr 0x800000 priority 3 vector cvgabintr 0xcc
```

Terminal Multiplexors

If you do not have a Systech terminal multiplexor, comment the following lines:

```
#pseudo-device  hty16
#pseudo-device  vtio
#device         rhp0 at vme16d16 ? csr 0x2000 priority 2 vector hps_intr 0xd0
```

Serial Table

If you do not have a serial tablet, comment out the following line:

```
#pseudo-device  stab
```

VPC Board

If you do not have a VPC controller board, comment out the following line:

```
#device         vpc0 at vme16d16 ? csr 0x480 priority 2 vector vpcintr 0xc8
```

If you turned to this section as you were reconfiguring your kernel, be sure to return to the section you were in, either Reconfiguring the Kernel for Multiple Disk Swap, Reconfiguring the Kernel for Diskless Clients, or Reconfiguring the Kernel for Other Systems.

Reconfiguring the UNIX Kernel

Solving Problems

Try these commands to resolve problems encountered during reconfiguration:

If your new configuration does not work, halt your system.

```
# /etc/halt
```

Enter this command to boot your back-up file of UNIX. (Remember that the old `vmunix` was copied to `vmunix.orig` so that you could have a backup.)

```
> b vmunix.orig -s
```

Move the original `vmunix` that was renamed `vmunix.orig` back to its original name under the root directory.

```
# mv /vmunix.orig /vmunix
```

Reboot the system. The system will run with its original configuration. Now repeat this subsection to attempt to get the specific configuration you want.

```
# /etc/reboot
```

For more information on kernel reconfiguration, see `config(8)` in the UNIX command reference.

Loading CADDStation

5

This section presents detailed procedures for loading CADDStation Software (referred to as CADDStation). The first part describes procedures for loading CADDStation on a workstation; the second part describes procedures for loading CADDStation on a server.

These procedures assume you have successfully completed the setup portion of systems software loading.

Notes

- Complete procedures for installing other CADDStation Systems applications exist in manuals specific to the application. To install any application other than CADDStation, consult the appropriate application documentation.
- The addition of any application except the single 85MB version of the mechanical CADDStation 4X package, for concurrent or serial use, requires a CADDStation with two 85MB disks in the stand-alone configuration.
- If, when installing multiuser CADDStation, you receive the File error: ca02 error message followed by the abnormal ending of your CADDStation session, this situation usually occurs because you do not have the correct access protection for temporary file creation. To correct the situation, enter the following command:

```
# chmod 777 /usr/tmp
```

- Appendix E repeats these procedures in an abbreviated form. For specific server configurations, you will be directed to Appendix E.

5.1 Loading CADDs on a Workstation

In this procedure, the left column presents user input and system output; the right column clarifies the interaction.

```
# cd /
#
# cd /dev
# MAKEDEV cvgpu0
# MAKEDEV cvtab0
# cd /usr/apl/cadds/scripts/templates/cadds_user
# cp {login,logout,.cshrc,.caddsrc,.suntools} /usr2/cadds
# cd /usr2/cadds
# mkdir parts
# chmod 777 .login.logout.suntools.cshrc.caddsrc *
# chown cadds .login.logout.suntools.cshrc.caddsrc * /usr2/cadds

# /etc/halt
> b
Systemname Login: cadds
```

Load the CADDs tapes according to the secured process described in Appendix D.

This creates a device entry for GPU.
This creates a device entry for tablet.

Prepare for reboot.
Boot.
From now on if cadds is typed at log-in prompt, user will be in CADDs. (Be patient: entering CADDs should take about 5 minutes.)

5.2 Loading CADDs on a Server

Step 1: Configuring /usr2

This subsection defines loading procedures for a 68020 server with 68010 and 68020 diskless clients.

Note

Use this procedure only if you are installing CADDs on a 68020 server with 68010 and 68020 diskless clients. If you have a 68020 server with 68020 diskless clients, 68020 diskful workstations, or 68020 tapeless workstations, see the appropriate procedure, B, C, or D, in Appendix E.

SERVER PROCEDURES—SINGLE DISK CONFIGURATION

ln -s /usr/servername /usr2 Enter to configure your disk to see /usr2:

SERVER PROCEDURES—DUAL DISK CONFIGURATION

The next steps show you how to configure your disk based on whether your 1st disk is 515MB or 300MB. The main difference is where you put /usr2:

- For 515MB disk 0 (1st disk), **usr2** goes in partition **xy1g**.
- For 300MB disk 0 (1st disk), **usr2** goes in partition **xy1d**.

FOR DUAL DRIVE CONFIGURATIONS IF DISK 0 IS 515MB:

```
# mkdir /usr2                      Add /usr2 by doing the following:
# vi /etc/fstab                    Edit this line into fstab:
                                  /dev/xy1g /usr2 4.2 rw 1 7
# vi /etc/exports                 Edit this line into /etc/exports:
                                  /usr2
# newfs /dev/rxy1g /usr2         Enter ONLY if pack does not contain data.
# mount -a
```

FOR DUAL DRIVE CONFIGURATIONS IF DISK 0 IS 300MB:

```
# mkdir /usr2                      Add /usr2 by doing the following:
# vi /etc/fstab                    Edit this line into fstab:
                                  /dev/xy1d /usr2 4.2 rw 1 7
# vi /etc/exports                 Edit this line into /etc/exports:
                                  /usr2
# newfs /dev/rxy1d /usr2         Enter ONLY if pack does not contain data.
# mount -a
```

SERVER PROCEDURES—ALL CONFIGURATIONS

REDIRECTING /TMP FILES:

```
# mkdir /usr2/tmp                 Do these things to redirect tmp files:
# chmod 777 /usr2/tmp
# rm -r /usr.MC68020/tmp /usr.MC68010/tmp
# rm -r /private.MC68020/usr/tmp /private.MC68010/usr/tmp
# ln -s /usr2/tmp /usr.MC68020
# ln -s /usr2/tmp /private.MC68020/usr
# ln -s /usr2/tmp /usr.MC68010
# ln -s /usr2/tmp /private.MC68010/usr
```

5.2 Loading CADDs on a Server (cont)

ETHERNET CONFIGURATION:

1. Set up `/etc/hosts.equiv` and `/.rhosts` files. (Shown in detail in *Administering the Network*.)
2. Reboot the server.
3. Reboot all clients.

CLIENT PROCEDURES—SINGLE DISK CONFIGURATION

`ln -s /usr/servername /usr2` Do this for each client.

CLIENT PROCEDURES—DUAL DISK CONFIGURATIONS

The next steps must be done for each client.

```
# mkdir /usr2
# vi /etc/fstab
# mount -a
```

Add `/usr2` by doing the following:
Edit this line into `fstab`:
`servername:/usr2 /usr2 nfs rw,hard 0 0`

CLIENT PROCEDURES—ALL CONFIGURATIONS

- Edit `/etc/hosts.equiv` and `/.rhosts` to proper configuration.
- MAKEDEV on any client specific devices (i.e., `qfb`, `cvtab0`).

Step 2: Loading CADDStation Software

PHASE 1: LOADING CADDs ON THE SERVER

```
# cd /usr/servername
# mkdir apl apl/cadds
# ln -s /usr/servername/apl/cadds /usr.MC68020/apl
# ln -s /usr/servername/apl/cadds /usr.MC68010/apl
# cd /dev
# MAKEDEV cvgpu0
```

This creates a device entry for GPU.

Now load CADDs according to the secured process described in Appendix D.

PHASE 2: CREATING A CADDs USER

The following are required for each CADDs user:

- Each CADDs user must have an entry in the server and client password file.
- Each CADDs user must have a home directory under `/usr2`.
- Each CADDs user's home directory must contain these six files:
`.login` `.suntools` `parts`
`.logout` `.caddsrc` `.cshrc`
- After making all client CADDs directories and server `/etc/passwd` file, download the server `/etc/passwd` file to each client using `rcp`.

EXAMPLE:

```
# mkdir /usr2/cadds
# cd /usr/apl/cadds/scripts/templates/cadds_user
# cp { .login, .logout, .cshrc, .caddsrc, .suntools } /usr2/cadds
# cd /usr2/cadds
# mkdir parts
# chown cadds /usr2/cadds parts .login .logout .cshrc .suntools .caddsrc
# chmod 777 .login .logout .suntools .cshrc .caddsrc parts
```

- Edit `.caddsrc` file to contain the line: `setenv CADDsHOST servername`
- Reboot the server.
- Reboot all clients and log in as `cadds`.

This section describes steps for installing CADDSt. You must have copies of your Disk Partition Maps that you filled with information from the worksheet utility. A summary of the steps described in this section follows.

1. Create `/usr2` on single disk systems.
2. Redirect `tmp` files.
3. Establish a CADDSt base directory.
4. Use `loadappl` to load two CADDSt object tapes.
5. Run `assemblecaddst`.
6. Use `loadappl` to load all CADDSt additional tapes.
7. Create part storage.
8. Set up a user named `caddst`.
9. Start the Graphics Accelerator.

If you are setting up a diskful workstation to run CADDSt over the network using NFS from another system, load the server first. For the diskful workstation, you need to perform only steps 1, 2, 3, 7, 8, and 9. These steps include mounting and linking the workstation to CADDSt running on a remote system.

If you are going to use the procedure of copying a built CADDSt to other identical systems, perform steps 1, 2, 3, 7, 8, and 9 on each system. You will use a system-to-system copy with the `tar` command (described in Copying CADDSt to Other Systems) to replace the `loadappl` and `assemblecaddst` procedures.

Installing CADD5

Planning to Load CADD5 under LMS

A system on which you are loading CADD5 from the application tapes must have the License Manager installed. The licenses on the License Manager must include *all* CADD5 applications that you plan to load and *only* those that you plan to load. Use `lm_display` to see what licenses are currently on your system's License Manager. Use `lm_transfer` to add or remove licenses. (See the *Installing and Using the License Management System*.)

If you have more than one system on which you want to run *identical* sets of CADD5 applications, you can install CADD5 on the first system and then copy it onto the second and subsequent systems using a special procedure outlined in the subsection Copying CADD5 to Other Systems, later in this section.

If you are going to copy CADD5 to a second system or subsequent systems, these systems will not need licenses on their systems *before* you copy CADD5 to them, but will need the License Manager installed and relevant licenses when a user is ready to run CADD5.

You must install the License Manager on every system that will run Computervision applications locally. For CADD5, this means that every system that has a Graphics Accelerator must have an installed License Manager. For Electronics applications and CADD5 applications that run at UNIX level (such as the Engineering Calculator), every system that runs these, even diskless clients, must have an installed License Manager. Instructions for installing the License Manager, as well as instructions for transferring licenses once the software is installed, can be found in the *Installing and Using the License Management System*.

Creating /usr2 on a Single Disk System

If you have two or more disks, you do not have to perform this step.

You want to keep part storage in the `/usr2` directory. Usually the `/usr2` directory resides on your second disk. If you have only a single disk, you normally do not have a `/usr2` directory. Create a `/usr2` directory that is linked to the `/usr` directory.

For a stand-alone system with a single disk, enter the following:

```
# ln -s /usr /usr2
```

For a system serving clients with a single disk, enter the following:

```
# ln -s /usr/servername /usr2
```

Redirecting tmp Files

If you are working on a stand-alone or a server, perform this step. You must have your Disk Partition Maps on hand.

The UNIX operating system and the CADDs program use the `/usr/tmp` directory as a storage place. (On a server, the directory is `/usr.MC68020/tmp`, with a link to `/usr/tmp`.) The `/usr/tmp` directory normally resides on your first disk, disk 0.

If your system is a stand-alone and, on your Disk Partiton Maps, your `tmp` files reside on disk 0, you do not need to do this step.

If your `tmp` files reside on any disk other than disk 0 or your system is a server with diskless clients, you must redirect your `tmp` files.

You redirect the `tmp` files by making a link from the real `tmp` location to the `/usr/tmp` directory. (See `ln(1)` in the UNIX command reference for more information on links.)

Specific procedures for stand-alone and server systems are shown below.

On a Stand-alone Workstation or Stand-alone Server

If your `tmp` files reside on any disk other than disk 0, enter the commands below, replacing `tmp-partition` as follows: If you checked the `tmp` box in your disk 1 partition map, your `tmp-partition` is `/usr2`; if you checked the `tmp` box in your disk 2 partition map, your `tmp-partition` is `/usr3`, and so on.

```
# rm -r /usr/tmp
# mkdir /tmp-partition/tmp
# chmod 777 /tmp-partition/tmp
# ln -s /tmp-partition/tmp /usr
```

On a Workstation or Server Serving Clients

If your `tmp` files reside in the partition Home Directories, your `tmp-partition` is `/usr/servername`. If your `tmp` files reside on any disk partition other than `/usr.MC68020` (such as `/usr/servername` or `/usr2`), enter the following commands, replacing `tmp-partition` with the directory name from your Disk Partition Map:

```
server# mkdir /tmp-partition/tmp
server# chmod 777 /tmp-partition/tmp
server# rm -r /usr.MC68020/tmp /private.MC68020/usr/tmp
server# ln -s /tmp-partition/tmp /usr.MC68020
server# ln -s /tmp-partition/tmp /private.MC68020/usr
```

If you are serving 68010 clients, also do the following:

```
server# rm -r /usr.MC68010/tmp /private.MC68010/usr/tmp
server# ln -s /tmp-partition/tmp /usr.MC68010
server# ln -s /tmp-partition/tmp /private.MC68010/usr
```

Installing CADDs

Establishing the CADDs Base Directory

The CADDs base directory is always `/usr/apl/cadds`. You must link the location where the software actually lives on each type of system to `/usr/apl/cadds`. If you have diskless clients, you need do nothing on the diskless clients to install CADDs. The CADDs software is loaded and run on the server.

CADDs software lives in the following directories for each listed system:

- On a server, for 68020 clients: `/usr.MC68020/servername/apl/cadds`
- On a server, for 68010 clients: `/usr.MC68010/apl/cadds`
- On stand-alones, diskful clients, and NFS clients: `/usr?/apl/cadds`

Procedures for specified systems are shown below.

On a Server or Workstation Serving Clients

If you are installing CADDs on a server serving clients, issue these commands on the server (note that `/usr.MC68020` is already linked to the `/usr` directory):

```
# mkdir /usr/servername/apl /usr/servername/apl/cadds
# ln -s /usr/servername/apl/cadds /usr.MC68020/apl
```

If the system is a server that serves 68010 clients, also issue the following command:

```
# ln -s /usr/servername/apl/cadds /usr.MC68010/apl
```

On an NFS Client Running CADDs from a Server

If you are installing CADDs on a diskful client to run CADDs from a server, create an NFS mount to the server's CADDs base directory by executing the following commands on your workstation:

```
client# cd /
client# mkdir /usr/apl/cadds
client# mount servername:/usr/apl/cadds /usr/apl/cadds
client# mount -p > /etc/fstab
```

On a Stand-alone or Diskful Client

If, on your Disk Partition Maps, CADDs lives on any a disk other than disk 0, follow these steps, replacing `/usr?` with `/usr2`, `/usr3`, etc., as appropriate:

```
# mkdir /usr?/apl /usr?/apl/cadds
# ln -s /usr?/apl/cadds /usr/apl
```

Loading CADDs Object Tapes with loadappl

You use the `loadappl` (for *load application*) utility to load from a 1/4-inch tape, a 1/2-inch tape, or remotely from another system. Before using `loadappl`, be sure you have made the proper links according to the previous subsection, Establishing the CADDs Base Directory.

NOTE The `loadappl` command automatically loads all applications that have licenses on the system's License Manager. You must check the licenses on your system's License Manager with `lm_display` before using `loadappl`. If the system does not have licenses for applications that you want to load, use `lm_transfer` to obtain correct licenses. If the system has licenses for applications that you do not want to load, transfer these licenses to another system.

NOTE If you plan to load Autoboard, you must load it before you load CADDs. Turn to the subsection Installing Autoboard in Section 7.

1. Mount the first CADDs object tape.
2. Logged in as root, enter the `loadappl` command:
`# /usr/cvbin/loadappl`
3. This first prompt asks if you are loading a 1/2-inch tape.

Application Load Procedure

This procedure loads the application tapes you have received. You must have the application tapes available at this time.

Is this a 1/2 inch tape (y/n RETURN = y) ?

Press RETURN for yes or enter n for no.

4. The next prompt asks if you are loading a system with a tape drive.

Is the tape drive local (y/n RETURN = y) ?

Press RETURN if you are loading a system locally.

Enter n if you are loading a system remotely.

If you answer n, the system prompts for the name of your remote host:

Enter the remote system name:

5. The utility prompts:

Load the application tape on the tape drive and press RETURN to continue:

Ensure that the first CADDs object tape is loaded. Press RETURN.

Installing CADDs

6. For CADDs, `loadappl` checks the applications on the tape and also checks the applications that are authorized on the License Manager hardware key on the system that you are loading. It automatically loads all applications that are on both.

Then the system prompts for another tape. After you have loaded all provided CADDs object tapes (probably two), stop this procedure, run `assemblecadds`. You will load CADDs additional tapes after running `assemblecadds`.

```
Do you have another application tape to load
(y/n RETURN = y) ?
```

If you have not loaded all CADDs object tapes, press RETURN for yes.

If you have already loaded all CADDs object tapes, enter n for no.

NOTE

If you are loading PDM Client software on this system, you must load PDM Client before you run `assemblecadds`. See Installing PDM Client in Section 7.

Using the `assemblecadds` Command

Create an executable CADDs program by assembling your CADDs object files with the following command:

```
# /usr/apl/cadds/scripts/assemblecadds
```

The system begins to assemble the CADDs applications you have loaded.

```
Beginning load of CADDs---Please wait
```

An operating system glitch may make the system restart the CADDs load. You can ignore the following message if it occurs on your system:

```
Potential jump across page boundary, reloading CADDs.
```

The system asks:

```
Do you wish to remove intermediate load objects? (default=n;
else y)
```

This question is asking if you want to remove all the `.o` (object) files from the system. If you do not plan to program in CADDs, you do not need these files. To save system space, you want to remove them. If you will be programming in CADDs, you need these files so that you can relink your new programs into your existing CADDs.

If you have Programming Development on your system, answer n to the prompt.

If you do not have Programming Development, answer y.

The system signals the end of the CADDs load.

```
End of load of CADDs
```

(If you had any patches installed before executing `assemblecadds`, you must reinstall the patches. If you anticipate requesting patches, do not use the `strip` command on your CADDs executable.)

Loading CADDs Additional Tapes with loadappl

In this subsection, you load CADDs Additional Files tapes, library tapes, and other CADDs applications tapes. (Information on loading applications from the UNIX Platform Application Tapes is in the subsection Planning to Load UNIX Platform Application Tapes in Section 7.)

1. Mount the first CADDs Additional Files tape and issue the following command:

```
# /usr/cvbin/loadappl
```

Answer *y* to the question about additional tapes until you have no more additional tapes.

2. Use `loadappl` to load other CADDs related applications.
3. Look at your Disk Partition Map to find the system location of each AEC library. If the library location is specified, do the following steps:

```
system# ln -s library-location/aec /usr/apl/cadd/data
```

Load each AEC library tape using `loadappl`.

Creating Part Storage

This part of the CADDs installation contains separate instructions depending on your configuration.

1. If you are installing a server or a stand-alone workstation, check your Disk Partition Maps to find the directory location of your local parts partition (*lpp*). It will be `/usr2` or `/usr3`, etc.

On a server (stand-alone or serving clients) or a workstation serving clients, if your *lpp* is in `/usr2`, issue the following command on your workstation:

```
# mkdir /usr2/cadd /usr2/cadd/parts
# cd /usr2
# chown cadd cadd cadd/parts
```

If your *lpp* is not located in `/usr2`, issue the following commands on your workstation:

```
# cd lpp-location
# mkdir cadd cadd/parts
# mkdir /usr2/cadd
# chown cadd cadd cadd/parts
# ln -s lpp-location/cadd/parts /usr2/cadd
```

2. If you are installing CADDs on a diskful client and you want to store parts on the server, check the workstation Disk Partition Maps and find the location of the workstation parts partition (*wpp*).

If you want additional local part storage, issue the following commands on your workstation:

```
# cd wpp-location
# mkdir parts parts/remote
# chown cadd parts parts/remote
# mount servername:wpp-location/cadd/parts wpp-location/cadd/
parts/remote
# mount -p > /etc/fstab
```

Installing CADDs

If you do not want additional local part storage, issue the following commands on your workstation:

```
# cd wpp-location
# mkdir parts
# chown cadds parts
# mount servername:wpp-location/cadds/parts wpp-location/cadds/
parts
# mount -p > /etc/fstab
```

3. If you are installing CADDs on a diskful client and you do not want to store parts on the server, check your workstation Disk Partition Maps and find the location of your local parts partition (*lpp*).

If your local parts partition (*lpp*) is located in */usr2*, you need do nothing.

If your local parts partition is not located in */usr2*, execute the following commands on your workstation:

```
# cd lpp-location
# mkdir cadds
# chown cadds cadds cadds/parts
# ln -s lpp-location/cadds/parts /usr2/cadds
```

Setting Up a User Named cadds

To set up a user named *cadds*, issue the following commands on your server, stand-alone, or diskful client. The entry in the */etc/passwd* file is already created. This creates a home directory of */usr2/cadds* for the user and copies some dot files into the home directory. It also creates a *parts* directory in the home directory and changes ownership of all files to *cadds*.

```
# mkdir /usr2/cadds /usr2/cadds/parts
# cd /usr/apl/cadds/scripts/templates
# cp .[cls]* /usr2/cadds
# cd /usr2/cadds
# chown cadds .[cls]* /usr2/cadds parts
# chmod a+rw .[cls]* /usr2/cadds parts
# chgrp 3000 .[cls]* /usr2/cadds parts
```

Starting the Graphics Accelerator

You must have CADDs loaded and assembled before you can start the Graphics Accelerator. There are two kinds of Graphics Accelerator: a GPU or a GAB.

If you are installing a system with a GPU, issue the following commands:

```
# cd /dev
# MAKEDEV cvgpu0
# /usr/apl/cadds/bin/CADDSGPU -hard
```

If you are installing a system with a GAB, issue the following commands:

```
# cd /dev
# MAKEDEV cvgab0
# reboot
```

If you are installing a diskful client without a GPU or a GAB, a workstation serving clients, or a server serving clients, edit the `.caddsrc` file as follows. (You will not do this on a stand-alone workstation or a stand-alone server.)

```
# vi /usr2/cadds/.caddsrc
```

Add the following line to the file:

```
setenv CADDSHOST servername
```

Mounting /usr Partitions on Clients

If you have installed a server or a workstation that serves clients, follow these steps on each client to complete the CADDs installation.

If the server has only one disk, issue the following command on each client:

```
client# ln -s /usr/servername /usr2
```

If the server has two or more disks, issue the following commands on each client:

```
client# mkdir /usr2
client# mount servername:/usr2 /usr2
client# mount -p > /etc/fstab
```

If your server has more than two disks, repeat the above commands on the client, substituting `/usr3` for the fourth disk, `/usr4` for the fifth disk, and so on.

Testing CADDs

For each server, stand-alone, and client, log out (using the `logout` command), then log in as `cadds`. Issue the following commands:

```
#00# ACT PART TEST
#00# ACT DRAW 1
#00# DEF VIEW TOP : X0Y0
#00# INS LIN : dd
#00# EXIT PART Q OS
```

If you log in as `cadds` and your windows appear and disappear, you may not have enough swap space. Check that you entered the correct numbers from your Disk Partition Maps. Check your release bulletin for application size information that you may have overlooked. If your Disk Partition Maps indicate swap on more than one disk, check that your `/etc/fstab` file contains a correct entry for multiple swap; check that your current kernel configuration file contains a correct multiple swap entry.

Installing CADD5

Copying CADD5 to Other Systems

If you have finished building CADD5 on a system and you have other systems on which you want to be able to run an *identical* set of CADD5 applications, you can copy your built CADD5 to other systems. The other systems do not need to have licenses for the CADD5 applications on their License Managers to use this procedure. These systems will need licenses on their keys for any user to run the applications.

If you do not want to run identical sets of CADD5 applications, you must load the second or subsequent systems following the previous installation procedures.

You must have partitioned the disks on the new system using the **worksheet** and **setup** utilities to accommodate the CADD5 applications you are loading. Hidden Line Removal (HLR), particularly, needs a large amount of swap space that must have already been allocated on the new system.

On a new system, complete the procedures in **Creating /usr2 on a Single Disk System**, **Redirecting tmp files**, **Establishing the CADD5 Base Directory**. Copy CADD5 to your system. Then follow procedures in **Creating Part Storage**, **Setting Up a User Named cadd5**, and **Starting the GPU**.

Your two systems must be connected over the network. (Alternatively, you could copy these CADD5 directories to tape and load them on another system using the **tar** commands shown, but without the **rsh** part.)

NOTE Do *not* try to use this method using the **rcp** command. This procedure uses a **tar** command format that pipes the output to the other system. This method preserves all links that you made on your installed system. If you were to use the **rcp** command, your links would not be preserved. Your new system would likely end up with two copies of CADD5.

Log in as **root** to the system with CADD5. Issue the following commands, substituting *tosystem* with the name of the system to which CADD5 is being copied.

```
tar cBf - /usr/apl/cadd5/bin | rsh tosystem tar xBf - /usr/apl/cadd5/bin
tar cBf - /usr/apl/cadd5/data | rsh tosystem tar xBf - /usr/apl/cadd5/data
tar cBf - /usr/apl/cadd5/scripts | rsh tosystem tar xBf - /usr/apl/cadd5/scripts
tar cBf - /usr/apl/cadd5/textfont | rsh tosystem tar xBf - /usr/apl/cadd5/textfont
tar cBf - /usr/apl/cadd5/oplog | rsh tosystem tar xBf - /usr/apl/cadd5/oplog
```

Installing the Assembly Component Libraries

If you have purchased Assembly Component Libraries, you must run a command to install them.

Assembly Component Libraries consist of two major elements: library tools, which allow selection and use of library parts, and the libraries themselves. The tools are available in three languages as price list items /1510 for English, /1530 for French, and /1550 for German. There are many libraries, such as price list items /1511, /1512, and /1514.

For every installation of Assembly Component Libraries, you must always load /1901, which contains three special CADDs commands.

Enter this command from any directory. Log in as root. Specify the packages by number. For example, to load packages /1901, /1510, and /1511, type:

```
# /usr/apl/ltools/install 1901 1510 1511
```

For the Assembly Component Libraries to work, you must add five directories to each user's path in the .caddsrc file. The CADDSPATH environment variable, where you will list these directories, holds a limited number of characters. (Too many characters can cause CADDs to fail on start-up.) In order to fit these directories into the CADDSPATH, we recommend that you link a directory called /ltools to the /usr/apl/ltools directory as follows:

```
# cd /  
# ln -s /usr/apl/ltools /ltools
```

Now add the following directories to the CADDSPATH environment variable in each user's .caddsrc file. In this example, the number 02 is used, which designates English. Change the number to 01 for French or 03 for German.

```
/ltools/cvmac:/ltools/cvmac/02:/ltools/data/dmenu/02:/ltools/data/  
par/02:/ltools/data/text/02
```

If the CADDSPATH environment variable still has too many characters, change the name of the /ltools directory to /lt in the above examples. Also, if necessary, you could link a directory called /cadds to /usr/apl/cadds and reduce all of your /usr/apl/cadds directories to /cadds.

Installing the AEC Supplemental Tape

To run the Structural Steel Modeling CVMAC, load the AEC Supplemental tape. This tape contains necessary libraries. As root, from any directory, type

```
% tar xvf /dev/rst0
```

Three CVMAC programs, CVAEC.SSM.CVM.EDIT.SPLATE, REPORT.STEEL and CONVERT.MEMBER, in the Structural Steel Modeling library (2515) all require a compiled FORTRAN file. The file must be copied into the directory that CADDs is started in. The program fails if the file is not found. The compiled FORTRAN file is called /usr/apl/cadds/data/aec/2515/cvaec/ssm/cvm/callf.o. Copy it to your home directory as follows:

```
% cd  
% cp /usr/apl/cadds/data/aec/2515/cvaec/ssm/cvm/callf.o .  
% cadds
```

Installing CADDStation

Setting Up a Diskful Client to Run Imagedesign

These directions explain how to set up a diskful client to run Imagedesign through NFS from a remote system. Both systems must already be set up to run CADDStation. The remote system must already be running Imagedesign.

The remote system that is already running Imagedesign is called the Imagedesign server. The system that you want to set up is called the Imagedesign client.

1. On the Imagedesign client, create the directories `/usr/user-name/parts` and `/usr/tmp/user-name.client-name`. If these directories already exist, be sure that they are empty.

For instance, for a user `hank` and a client `sirius`, create the directories `/usr/hank/parts` and `/usr/tmp/hank.sirius` on system `sirius`.

Be sure that no user is currently working in either of these directories.

2. Add this line to the user's `.caddsrc` file on the Imagedesign client:

```
# setenv CADDStation_IMAGE_HOST remote-host
```

For instance, you want a user named `hank` to be able to run Imagedesign on his system `ariel` from the Imagedesign server named `ariel`. `hank's` `.caddsrc` file must contain:

```
# setenv CADDStation_IMAGE_HOST ariel
```

3. On both the client and the server systems, you must modify the files `/etc/servers` and `/etc/rpc`.

In `/etc/servers`, add this line:

```
rpc tcp /usr/apl/caddStation/bin/image_daemon 200002 1
```

In `/etc/rpc`, add this line:

```
CADDStation_IMAGE 200002
```

After you change these files, each system must be rebooted or the process `/etc/inetd` must be killed and restarted.

4. Mount your directories.

Any directory that will contain a part to be shaded and the CADDStation tmp files for that part must appear to be local to Imagedesign. If the part directories or tmp files are not on the system on which Imagedesign is running, these directories must be mounted from the system on which they live to the system on which Imagedesign is running.

To mount the parts files and the tmp files, at the Imagedesign server, type:

```
# mount client:/usr/user/parts /usr/user/parts
# mount client:/usr/tmp/user.client /usr/tmp/user.client
```

For example, you have created the directories `/usr/hank/parts` and `/usr/tmp/hank.sirius` on the client system `sirius`. To mount the parts files and the tmp files to the server `ariel`, at the server, type:

```
# mount sirius:/usr/hank/parts /usr/hank/parts
# mount sirius:/usr/tmp/hank.sirius /usr/tmp/hank.sirius
```

Loading Additional CADDs Software

To load additional CADDs software, the following must be true:

- The system manager has the original CADDs tape set.
- The numbers, names, and types of clients are unchanged.
- You must have a new License Manager.
- You must have used the `lms_update` command.

To load additional CADDs software, perform the following steps:

1. Kill the `CADDsgpu` process.
2. Move or delete `/usr/apl/cadd/bin/CADDs` from the server.
3. Check the `/usr/apl/cadd` directory and see if `src` or `lib` exist. If so, remove them.
4. Load CADDs Object Tapes #1 and #2 on the server using the `loadappl` command. Procedures for `loadappl` are found at the beginning of Section 6 in the subsection Loading CADDs Object Tapes with `loadappl`.
5. Execute `assemblecadd` to create new executable CADDs.

Verifying the Existence of Programming Support Files

Do the following to verify the existence of installed Programming Support files.

1. To verify that the support tools exist, check the `/usr/apl/cadd/support` directory for three subdirectories: `bin`, `doc`, and `data`. If /0550 price list item has been installed, the `support` directory contains many files, including `cksubrs`.

The `data` directory will contain the `stubs/custlib.a` file, necessary for `caddload` to run correctly. Brief descriptions of the other files in the `data` directory are contained in the `data/README` file.

The `doc` directory will contain documentation files. Running the `doc/help` file produces a short list of the tools and documentation available, and `toolhelp` gives a complete list of programming tools.

2. To program `cadd`, you need the `cadd` objects, libraries, and insert files.

The objects reside under `/usr/apl/cadd/src/cadd` and have names ending in `.o`. The ones ending in `1001.o` are the ones that build only base `cadd`.

The `cadd` libraries have names ending in `.a`. The UNIX library names begin with `lib`, for example, `libc.a`. The library mentioned above, `support/data/stubs/custlib.a`, includes all the supported interfaces, if do not plan to load into `cadd`.

The include files are under the directory `/usr/include/cadd`. They have names ending in `.h` if they are to be included in a C program, or `.fh` if they can be included in a FORTRAN program.

3. The `/usr/apl/cadd/src/cadd` directory includes the `cadd_sym.c` file for convenience in adding commands to the dispatch table.

Installing CADDs

Setting Up a System to Run Kanji Software

To install Kanji, you must follow these procedures:

1. In the **setup** utility, select to load 3 tapes. Also select Kanji text fonts.
2. In the **setup** utility, in the software form, select Japanese UNIX Interface for Kanji Level I. If you are loading Kanji Level II, also select Kanji Vector Font Support. You also must select FORTRAN so you can compile Kanji fonts. You do not need to select Kanji Libraries from the UNIX tapes, unless you are installing Kanji Program Development.
3. When you execute **setup**, the system indicates which of the three tapes you should insert first. You will load tapes in the following order: Tape #1, Tape #3, Tape #1, Tape #2, Tape #3. Be certain that you follow the tape loading sequence exactly as the instructions state.
4. Load /0902, the Japanese UNIX Interface from the Platform Application tapes using **loadappl**—(see Loading UNIX Platform Application Tapes in Section 7). If you are loading Kanji Level II, also load /0900 and /0901, Kanji Vector Font Support.
5. Install CADDs, following instructions earlier in this manual. Be sure to select /1007, CADDs Kanji Level I. If you are loading Kanji Level II, also select /1009, CADDs Kanji Level II.

6. To assemble Kanji Level I fonts, as root, issue the following command:

```
# cd /usr/apl/cadds/src/graphics/ggs/textfont/kanji
# remakefonts.kanji
```

It takes 1/2 hour to assemble Kanji I fonts and requires 612KB.

7. To assemble Kanji Level II fonts, as root, verify that **/usr/lib/fonts/fixed-widthfonts/kanji/kanjifont** exists. Then issue the following commands:

```
# cd /usr/apl/cadds/src/graphics/ggs/textfont/kanji/lev2
# maketextfontall
# cd ..
# remakefonts.kanji
# remakefonts.kanji.lev2
```

It takes 2 hours to load the kanji Level II fonts and uses 1951KB.

You can copy compiled Kanji fonts to other systems running Revision 4.0 software.

8. Reboot the system with **/etc/reboot** or reinitialize the graphics processor.
9. Access Kanji from within CADDs:

```
login: cadds
```

You should see a Katakana-Kanji Translation window.

You must enter the following command:

```
#01# SElect LANguage Japanese ON
```

Installing Software Patches

To install individual CADDs software patches, use the `install_patch` command. This command modifies the CADDs executable created by the `assemblecadds` command.

NOTE Patch tapes may include special instructions. Read them first and follow any necessary steps.

If you have used the `strip` command on CADDs, you will have to reinstall CADDs to use the `install_patch` command.

The use of the `install_patch` command is restricted to the installation of software patches and special software distributed by Computervision. It is *not* intended to be used as a development tool for the installation of customer generated programs.

Using the `assemblecadds` or the `caddslload` commands destroys any patches you have loaded. If you execute `assemblecadds` or `caddslload` after installing a patch, you must reload the patch.

To install a patch, execute the following steps:

1. Log in as `root` (superuser).
2. Create a directory to contain the patch(es).

```
# mkdir /usr/patch
```
3. Mount the patch tape and issue the following command:

```
# /usr/cvbin/loadappl
```

Answer `y` to the question about additional tapes until you have no more patch tapes. (See the subsection Loading CADDs Object Tapes with `loadappl`, if necessary.)

4. Change directory to `/usr/patch`. If a patch object file exists (a file named `patch_number.o`, for example, `40001.o`), continue with step 5. (Some patches, such as on-line documentation, may not include an object file and you do not need to use the `install_patch` command.)

```
# cd /usr/patch
# ls
```

5. Incorporate the patch object file into CADDs using the `install_patch` command. The command has the following format:

```
install_patch executable object-file [-o result]
```

Where:

executable is the special CADDs executable file.

object-file is the patch file.

result is an optional copy of the original executable containing the patch.

For example:

```
# install_patch CADDs /usr/patch/40001.o
```


This section gives procedures for the following:

- Creating /usr2 on a Single Disk System
- Redirecting tmp Files
- Linking Application Directories
- Loading Application Tapes with loadappl
- Installing Schematic Design
- Installing Autoboard
- Installing HILO-3 with getappl
- Installing the Electromechanical Gateway
- Installing PDM Client

Planning to Load Applications under LMS

A system on which you are loading applications from the application tapes must have the License Manager installed. The License Manager must have licenses for the applications that you plan to load. You may also have licenses on the key for applications on the tape that do not want to load; for application tapes, loadappl asks which applications you want to load. Use lm_display to see the licenses that are currently on your system's License Manager. Use lm_transfer to add licenses.

If you have more than one system on which you want to run an identical application, you can install it on the first system and then copy it onto the second and subsequent systems using the procedure outlined in Copying CADDs to other Systems in Section 6. You must substitute the appropriate directories into the procedure for each application.

If you are going to copy an application to a second system or subsequent systems, these systems do not need licenses *before* you copy the application to them, but will need the License Manager installed and relevant licenses transferred when a user is ready to run the application.

You must install the License Manager on every system that will run Computervision applications locally. For CADDs, this means that every system that has a Graphics Accelerator must have an installed License Manager. To run Electronics applications and CADDs applications that run at the operating system level (such as the Engineering Calculator), every system, even diskless clients, must have an installed License Manager.

Instructions for installing the License Manager, as well as instructions for transferring licenses once the software is installed, are in the *Installing and Using the License Management System*.

Installing Applications

Planning to Load UNIX Platform Application Tapes

To load UNIX Platform Application tapes, you must have a License Manager installed on your system. The License Manager must have licenses for the utilities that you want to load. For Platform Application tapes, `loadappl` asks which applications you want to load. You do not, however, need a license to run this software once it is loaded. For a complete list of software on the UNIX Platform Application tapes, see the `/usr/license/data/mod_des` file.

Creating /usr2 on a Single Disk System

If you have two or more disks, you do not have to perform this step.

You want to keep part storage in the `/usr2` directory. Usually the `/usr2` directory resides on your second disk. If you have only a single disk, you normally do not have a `/usr2` directory. Create a `/usr2` directory that is linked to the `/usr` directory.

For a stand-alone system with a single disk, enter the following:

```
# ln -s /usr /usr2
```

For a system serving clients with a single disk, enter the following:

```
# ln -s /usr/servername /usr2
```

Redirecting tmp Files

If you are working on a stand-alone or a server, perform this step. You must have your Disk Partition Maps on hand.

The UNIX operating system and the CADDs program use the `/usr/tmp` directory as a storage place. (On a server, the directory is `/usr.MC68020/tmp`, with a link to `/usr/tmp`.) The `/usr/tmp` directory normally resides on your first disk, disk 0.

If your system is a stand-alone and, on your Disk Partiton Maps, your `tmp` files reside on disk 0, you do not need to do this step.

If your `tmp` files reside on any disk other than disk 0 or your system is a server with diskless clients, you must redirect your `tmp` files.

You redirect the `tmp` files by making a link from the real `tmp` location to the `/usr/tmp` directory. (See `ln(1)` in the UNIX command reference for more information on links.)

Specific procedures for stand-alone and server systems follow.

On a Stand-alone Workstation or Stand-alone Server

If your *tmp* files reside on any disk other than disk 0, enter the commands below, replacing *tmp-partition* as follows: If you checked the *tmp* box in your disk 1 partition map, your *tmp-partition* is */usr2*; if you checked the *tmp* box in your disk 2 partition map, your *tmp-partition* is */usr3*, and so on.

```
# rm -r /usr/tmp
# mkdir /tmp-partition/tmp
# chmod 777 /tmp-partition/tmp
# ln -s /tmp-partition/tmp /usr
```

On a Workstation or Server Serving Clients

If your *tmp* files reside in the partition Home Directories, your *tmp-partition* is */usr/servername*. If your *tmp* files reside on any disk partition other than */usr.MC68020* (such as */usr/servername* or */usr2*), enter the following commands, replacing *tmp-partition* with the directory name from your Disk Partition Map:

```
server# mkdir /tmp-partition/tmp
server# chmod 777 /tmp-partition/tmp
server# rm -r /usr.MC68020/tmp /private.MC68020/usr/tmp
server# ln -s /tmp-partition/tmp /usr.MC68020
server# ln -s /tmp-partition/tmp /private.MC68020/usr
```

If you are serving 68010 clients, also do the following:

```
server# rm -r /usr.MC68010/tmp /private.MC68010/usr/tmp
server# ln -s /tmp-partition/tmp /usr.MC68010
server# ln -s /tmp-partition/tmp /private.MC68010/usr
```

Installing Applications

Linking Application Directories

This step is valid for all applications except CADDs. All information for installing CADDs is in Section 6.

Code for application programs assumes the application lives in the `/usr/apl/application-name` directory, called the *application base directory*. The application base directory is on disk 0 by default. If your Disk Partition Maps show an application on a different disk, link a directory named `/usr/apl/application-name` to the real application location.

Look on your Disk Partition Maps to find the location of each application. For each application that is not shown on the `/usr` partition, make two real directories and then link `/usr/apl/application-name` to the application's real directory.

For example, if the application is on disk 1, in the `/usr2` partition, enter the following:

```
# mkdir /usr2/apl /usr2/apl/application-name
# ln -s /usr2/apl/application-name /usr/apl
```

If the application is on disk 2, the directory is in `/usr3`; if the application is on disk 3, the directory is in `/usr4`, and so on. If the application is designated in the Home Directories, the `usr?` is `/usr/servername`.

The following list gives names of software packages, with the directories and links you must make to load them. Replace `usr?` with the correct `/usr` directory.

Schematic Design Loading	<pre># mkdir /usr?/apl /usr?/apl/electrical # ln -s /usr?/apl/electrical /usr/apl</pre>
Schematic Design Software	<pre># mkdir /usr?/apl /usr?/apl/wcs # ln -s /usr?/apl/wcs /usr/apl/wcs</pre>
Schematic Design Library	<pre># mkdir /usr?/apl /usr?/apl/library # ln -s /usr?/apl/library /usr/apl</pre>
Thermal Analysis Interface Loading	<pre># mkdir /usr?/apl /usr?/apl/4960 # ln -s /usr?/apl/4960 /usr/apl</pre>
User Interface Management System	<pre># mkdir /usr?/apl /usr?/apl/uims # ln -s /usr?/apl/uims /usr/apl</pre>
Autoboard Application Software	<pre># mkdir /usr?/apl /usr?/apl/gapl # ln -s /usr?/apl/gapl /usr/apl</pre>

The base directories for CADAT and SABER are `/usr/cadat` and `/usr/saber`, respectively. Link the location from your Disk Partition Maps for these applications as follows:

CADAT 6 Simulation (HHB)	<pre># mkdir /usr?/cadat # ln -s /usr?/cadat /usr</pre>
SABER	<pre># mkdir /usr?/saber # ln -s /usr?/saber /usr</pre>

Loading Application Tapes with loadappl

You use the `loadappl` (for *load application*) utility to load applications from either a 1/4-inch or a 1/2-inch tape. You can also use it to load a system remotely from another system. For all software that is loaded with `loadappl`, you must have a license on the License Manager on the system you are installing.

Be sure you have made the proper links between `/usr` and where the applications will be loaded on the system according to the previous subsection, Linking Application Directories.

Note

If you are loading HILO-3, Schematic Design, or Autoboard, turn to the subsections later in this section that apply. These instructions will return you here to use `loadappl` where appropriate.

1. Mount the first application tape.
2. Logged in as `root`, enter the `loadappl` command:

```
# /usr/cvbin/loadappl
```
3. This first prompt asks if you are loading a 1/2-inch tape.
Application Load Procedure
This procedure loads the application tapes you have received.
You must have the application tapes available at this time.
Is this a 1/2 inch tape (y/n RETURN = y) ?
Press RETURN if you are loading a 1/2-inch tape.
Enter n if you are loading a 1/4-inch tape.
4. The next prompt asks if you are loading a system with a tape drive.
Is the tape drive local (y/n RETURN = y) ?
Press RETURN if you are loading a system locally.
Enter n if you are loading a system remotely.
If you answer n, the system prompts for the name of your remote host:
Enter the remote system name:
5. The utility prompts:
Load the application tape on the tape drive and press RETURN to continue:
Load your first application tape.

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6. The loadappl utility displays a menu of options.

Menu of Options:

-
- 1) List of application(s) on tape
 - 2) Add application(s) to installation list
 - 3) Delete application(s) from installation list
 - 4) Install selected application(s)
 - 5) Display this menu
 - 6) Quit

Enter menu option: 1

Enter 1 to list applications that you can load from this tape.

7. loadappl lists applications on the first tape that your system is authorized to run according the License Manager and redisplay the Menu of Options.

appl num	model number	selected (x)		appl num	model number	selected (x)
-----	-----	-----		-----	-----	-----
1)	1001			2)	1002	
3)	1003			4)	1004	

Menu of Options:

-
- 1) List of application(s) on tape
 - 2) Add application(s) to installation list
 - 3) Delete application(s) from installation list
 - 4) Install selected application(s)
 - 5) Display this menu
 - 6) Quit

Enter menu option: 2

Enter 2 to select which applications you want to load onto this system.

8. The utility prompts you to identify the applications, by *application number*, you want to load on this system. The application numbers are in the left columns. *Do not enter the model numbers.*

Enter list of applications:

Enter the numbers of the applications you want to load. You can enter

- A single application number
- A range of application numbers
- Number combinations separated by spaces or commas (1 2,3 7-10,11,13-15)

9. After you enter the application numbers, you must list the applications again to ensure that the applications you chose are now marked as selected. Select menu option 1. The applications that are selected have an X in column 3.

appl num	model number	selected (x)		appl num	model number	selected (x)
1)	1001	X		2)	1002	X
3)	1003			4)	1004	X

10. Enter menu option 4 to load the selected applications.

Enter menu option: 4

11. The system asks for the directory in which you want to load the selected applications.

Enter the directory name in which all the applications will be loaded (RETURN = /):

Enter a return for the root directory.

If you answer n for no, the system asks you for the full path name of the alternative loading path. If you are installing Autoboard, enter /usr/apl; the directory **apl** is installed. If you are installing CADAT, SABER, Kanji, or Schematic Design, enter /usr. If you are installing the Electromechanical Gateway on a system without CADDs, enter /usr. If you are installing the Electromechanical Gateway on a system with CADDs, enter your selected partition, /usr2, /usr3, etc.

The system displays

Installing application appl. 00 onto directory / ...

12. **loadappl** asks if you have more tapes to load.

Do you have another application tape to load
(y/n RETURN = y) ?

Press RETURN if you have another tape to load.

Enter n if you do not have any more tapes to load.

If you are loading Autoboard or Schematic Design, return to the appropriate subsection.

13. If your clients have disks, you must create mounts on your workstations so you can run the application from a remote system using NFS. Create the mounts as follows:

```
# cd /
# mkdir /usr/apl/applic-directory
# mount servername:/usr/apl/applic-directory /usr/apl/applic-directory
# mount -p > /etc/fstab
```

Installing Applications

Installing Schematic Design

The following steps tell you how to load Schematic Design.

Note

If you are also loading HILO-3, turn first to the section called Installing HILO-3, follow that procedure, then return here to load Schematic Design.

Here is a summary of the steps you perform:

- Create links according to Linking Application Directories.
- Use `loadappl` to load the application from the tape.
- Edit the `/etc/passwd` file.
- Change directories, then issue the `install` command.
- As part of the `install` script, confirm locations of the files being installed.

1. Be sure that you have made the proper links between `/usr` and the location where the application will be loaded on the system according to Linking Application Directories. Check that a `/usr/apl` directory exists.
2. Mount the first application tape.
3. As **root**, enter the following command:

```
# /usr/cvbin/loadappl
```

Follow the instructions in the beginning of this section, Loading Application Tapes with `loadappl`.

4. Edit the `/etc/passwd` file.

```
# vi /etc/passwd
```

Add the following entries to direct the `install` script away from the default and into the home directories:

```
wcs:: user-id-#:group-id-#:Ecae Tools:/usr/apl/wcs:/bin/csh  
library:: user-id-#: group-id-#:Ecae Library:/usr/apl/library:/bin/csh
```

5. After you have loaded all of Schematic Design and the applications you chose to load (CADAT, SABER, `schedit`, and HILO), change to the electrical directory.

```
# cd /usr/apl/electrical
```

Issue this command to install Schematic Design and its applications:

```
# install all
```

6. Before it loads each set of files, the system checks for `/etc/passwd` entries for `wcs` and `library`. (If entries do not exist, the system creates them.) It displays the entry and tells you that the files will be loaded in the home directory. Enter `cont` to continue, or `exit` to abort the installation procedure. For example:

```
FILES WILL BE LOADED IN -wcs  
PASSWORD ENTRY FOR WCS WAS FOUND TO BE:
```

wcs::700:70:ECAE TOOLS: /usr/apl/wcs:/bin/csh

If you wish to change the home directory for the user -wcs the system administrator will need to edit /etc/passwd. To continue the installation with -wcs home directory-> /usr/apl/wcs, type cont. To exit type exit: cont
Type exit aborts the command p returns to UNIX prompt

7. The **install all** command displays messages as it installs each application.

```
Installing: 4000 (4017...)
Schematic Design
Mon Mar 23 08:58:29 EST 1987
This will take approx. nn min to complete
```

It searches for each Schematic Design application in the /usr/apl/ electrical directory and notifies you of any application that it cannot find. You see a message for each application that you did not select to load:

```
No distribution directory found for Model 4000 (4017...)
Press <RET> to continue:
```

Press RETURN to continue the command.

8. After several minutes, a message tells you that the installation is finished.

```
Done . . . Login as demosch
```

Schematic Design takes approximately 10 minutes to install.

Check the /usr/apl/electrical directory. If it is empty, except for the install file, then all applications you selected were successfully installed.

9. Log out, then log in as **demosch** (stands for *demo-Schematic Design*).

If you do not want to run Schematic Design remotely on other systems, your installation is complete.

If you have diskless clients, the directories and links you made in Linking Application Directories, provided the necessary connections to enable you to run Schematic Design remotely from your diskless clients.

10. If you want to run Schematic Design remotely on diskful clients, complete this additional step.

Create the mounts on each diskful client as follows:

```
client# cd /usr/apl
client# mkdir wcs library electrical
client# cd /
client# mount servername:/usr/apl/wcs /usr/apl/wcs
client# mount servername:/usr/apl/library /usr/apl/library
client# mount servername:/usr/apl/electrical /usr/apl/electrical
```

The following lines should be entered for CADAT, SABER, and UNIX on-line documentation, as appropriate for your configuration:

```
client# mount servername:/usr/CADAT /usr/CADAT
client# mount servername:/usr/Saber /usr/Saber
client# mount servername:/usr/man /usr/man
```

Installing Applications

Enter this line, which adds these mounts permanently to your system:

```
client# mount -p > /etc/fstab
```

The installation is complete. Before you use multiuser Schematic Design, be sure each user has a proper log-in with correct path names. If you are running Yellow Pages, this will be performed for you. If you are not running Yellow Pages, check each user's log-in by changing to the `/usr/demosch` directory and issuing the `ls -a` command. For information on setting up users, refer to *Managing the CADDStation System* in the *CADDStation Systems Manager Guide*.

Installing Autoboard

This is a summary of the steps you perform to install Autoboard:

- Create links according to Linking Application Directories.
- Use **loadappl** to load the application from tape.
- Use the **aduser** command to add a user named **autobd**.
- Log out, then log in as **autobd** to test the software.

Note

If you are installing Autoboard with CADDs, you must load Autoboard before you run the **assemblecadds** command.

To install applications on multiple systems, have a list of your system names on hand. To install Autoboard, follow these steps:

1. Be sure that you have made the proper links between **/usr** and the location where the application will be loaded on the system according to Linking Application Directories. Check that a **/usr/apl** directory exists.
2. Mount the first application tape.
3. As **root**, enter the following command:

```
# /usr/cvbin/loadappl
```

Follow the instructions in Loading Application Tapes with **loadappl**.

4. Enter these commands to set up a user named **autobd**. Then log out and log in as **autobd** to test the software.

```
# chmod +x /usr/apl/gapl/home/adusr
# /usr/apl/gapl/home/adusr
# chown -R autobd /usr/apl/gapl/home
```

5. If you do not want to run Autoboard remotely on other systems, your installation is complete.

If you have diskless clients, the installation is complete. The links you made in Linking Application Directories provided the necessary connections to enable you to run Autoboard from your diskless clients.

If you want to run Autoboard remotely using NFS on diskful workstations, perform these additional steps on each diskful workstation.

```
ws# cd /
ws# mkdir /usr/apl/gapl
ws# mount servername:/usr/apl/gapl /usr/apl/gapl
ws# mount -p > /etc/fstab
```

On each diskful workstation, set up a user named **autobd**:

```
ws# chmod +x /usr/apl/gapl/home/adusr
ws# /usr/apl/gapl/home/adusr
ws# chown -R autobd /usr/apl/gapl/home
```

The installation is complete. Before you use Autoboard, be sure each user has a proper log-in with correct path names.

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Installing HILO-3

To install HILO-3, you use the **getappl** command, rather than the **loadappl**. You do not need a license an your License Manager to install HILO-3. You must use the **getappl** command to load HILO-3 before you use **loadappl** to load Schematic Design.

Here is a summary of the steps you perform:

- Create links according to Linking Application Directories (earlier in this section).
- Use **getappl** to load the application from tape.

You can install HILO-3 on several systems during this procedure if you wish; be sure to have a list of your system names on hand.

Note

If you are installing HILO-3, you must install it before you install any other Schematic Design applications.

1. Be sure that you have made the proper links between **/usr** and the location where the application will be loaded on the system according to Linking Application Directories. Check that a **/usr/apl** directory exists.

2. Mount the first application tape.

For a 1/4-inch tape, be sure the indicator points away from the word **SAFE**. For a 1/2-inch tape, be sure to install the write ring.

3. If you have a 1/4-inch tape drive, enter the following command:

```
# /usr/cvbin/getappl /dev/rst0
```

If you have a 1/2-inch tape drive, enter the following command:

```
# /usr/cvbin/getappl /dev/rmt0
```

If you are loading a tapeless system, be sure you have included client and server names in your network connections. You must be able to remote log in to the server before you issue the next command.

If you remote host has a 1/4-inch tape drive, enter the following command:

```
# /usr/cvbin/getappl remote-host:/dev/rst0
```

If your remote host has a 1/2-inch tape drive, enter the following command:

```
# /usr/cvbin/getappl remote-host:/dev/rmt0
```

-
4. The system displays a status message, a list of applications and a sub-menu. For example:

Scanning tape, please wait ...

```
appl price list systems systems | appl price list
systems systems
num. number auth'd inst'd | num. number
auth'd inst'd
```

```
-----
1) appl.00 3 0 | 2) appl.01 3
0
```

Menu of Options:

- ```

1) list application(s) on tape
a) add application(s) to installation list
d) delete application(s) from installation list
i) install/authorize selected application(s)
m) menu--display this menu
q) quit without change
```

Enter menu option:

5. Enter l to list the application numbers on the tape. The screen displays a detailed list of applications. Find the numbers for the applications you want to install and write them down for later use.

6. The following prompt appears:

Enter menu option: a

This option allows you to add applications to the installation list.

7. The system prompts for a list of applications:

Enter a list of applications: *nn*

Enter the numbers of the applications that you want to run. Enter

- A single application number
- A range of application numbers
- Number combinations separated by spaces or commas (1 2,3  
7-10,11,13-15)

8. To begin the installation, enter menu option i.

If you have a 1/4-inch tape, you must install the application(s) on all the systems for which they are authorized. The program tells you the number of systems on which you can install the applications:

The applications you selected can be installed on *n* systems.

If you have a 1/2-inch tape, you may install the application(s) on any or all of the systems for which they are authorized. The program asks you for the number of systems on which you are installing the applications:

How many systems would you like to install (1-n):

# Installing Applications

---

## 9. The system prompts

Enter host name of system 1: *first-system-name*

Enter the system name of the first system on which you are installing the application. The system then checks the system name. If the application can be installed on the system you specified, you receive a prompt for the name of the next system.

Enter host name of system 2: *second-system-name*

However, if you enter an incorrect system name, you receive an error message. Examples of error messages are

```
wrongsystemname: unknown host
command not found
system badname is not a CV system
```

The system asks if you want to try again:

```
We cannot install application(s) on system wrongname.
DO YOU WANT TO TRY ANOTHER SYSTEM (y/n):
```

If you answer y for yes, the program prompts again for the name of the system. If you answer n for no, the program aborts, giving this message: loader: program aborted, application(s) not installed.

## 10. After you correctly enter the appropriate system names, the system asks you to confirm the information.

```
Continuing beyond this point restricts ALL applications
on this tape to run on ONLY THE SYSTEMS YOU JUST
SELECTED.
DO YOU WANT TO CONTINUE (y/n): y
```

The system displays status information as it installs each application. For example:

```
Installing application appl .00 onto directory / ...
```

## 11. When it has finished installing the application(s), the system automatically quits the `getappl` utility and returns you to the `#` prompt.

Return to the section on Installing Schematic Design and follow the procedures to complete the installation.



---

## Installing the Electromechanical Gateway

---

The Electromechanical Gateway software is loaded under the same directory name (**apl/cadds**) as the CADDs software. Therefore, if you are installing the Electromechanical Gateway on a system that has CADDs loaded on it, you must load the Gateway software under a partition different from the one the CADDs software is loaded in.

The two subsections below describe installing the Electromechanical Gateway on a system with or without CADDs. Choose the procedure that applies to your system.

### Note

---

The Electromechanical Gateway uses some Autoboard files. The following procedures assume that Autoboard is installed on the system also.

You need a license on the License Manager to load the Electromechanical Gateway. You do not need a license to run the Electromechanical Gateway.

---

### Installing Gateway On a System without CADDs

If you are installing Gateway and not installing CADDs on this system, then Gateway should be installed in the **/usr/apl** directory. (If you install CADDs on this system in the future, you will need to reinstall Gateway under a different partition.) Follow this procedure:

1. As **root**, enter the following command:

```
/usr/cvbin/loadappl
```

Follow the instructions earlier in this section under Loading Application Tapes with **loadappl**. Select feature number **4110**, enter the directory location as **/usr**.

2. Change directory to **/usr/apl/cadds/data**.

```
cd /usr/apl/cadds/data
```

3. Copy the Gateway verb/noun tables to different file names, as follows:

```
cp vnpgateway vnp
cp vnpgateway-vnto vnp-vnto
cp vnpgateway-vnto.attr vnp-vnto.attr
```

4. Edit the template **/usr/apl/gapl/home/.elecrc** file with **vi** as follows:

Change the **CADDSPATH** entry to

```
setenv CADDSPATH '/usr/apl/cadds:/usr/apl/cadds/data:
/usr/apl/cadds/data/modtab:/usr/apl/cadds/bin:/usr/cadds/parts=C'
```

Note that the Gateway create directory is specified by **/usr/cadds/parts=C**. If you want to use a different directory for your Gateway parts, change this entry. If you want the current working directory to be the create directory, specify **\$cwd=C**.

Comment out the **CADDsHOST** line (that is, place a pound sign (#) in the first position in the line).

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---

5. Copy the template `.elecrc` file to each user's home directory and give the user ownership:

```
cp /usr/apl/gapl/home/.elecrc -username
/etc/chown username -username/.elecrc
```

Add the following line to the user's `.cshrc` file:

```
limit stacksize 40m
```

6. Log out of the system. Log back in as a user. Execute the gateway command:

```
% gateway
```

Turn to the *Electromechanical Gateway User Guide* for instructions on use.

## Installing Gateway On a System with CADDs

If you have installed CADDs on this system and are now installing Gateway, you must install Gateway on a partition other than `/usr`. If, in the course of loading software, you linked `/usr/apl` to another partition, such as `/usr2` or `/usr3`, you may not load Gateway into that partition either. You must load it into a partition that does not contain CADDs. Select a `/usr?` partition to load Gateway in; then follow this procedure:

1. As root, enter the following command:

```
/usr/cvbin/loadappl
```

Follow the instructions earlier in this section under Loading Application Tapes with `loadappl`. Select feature number 4110, enter the directory location as `/usr2`, `/usr3`, or wherever you choose to load your Gateway software. Insert your selected directory for `/usr?` in the steps below.

2. Change directory to `/usr?/apl/cadds/data`.

```
cd /usr?/apl/cadds/data
```

3. Copy the Gateway verb/noun tables to different file names, as follows:

```
cp vnpgateway vnp
cp vnpgateway-vnto vnp-vnto
cp vnpgateway-vnto.attr vnp-vnto.attr
```

4. Copy all files from the `/usr?/apl/gapl` directory to `/usr/apl/gapl`:

```
cp -r /usr?/apl/gapl /usr/apl
```

5. Edit the template `.elecrc` file as specified below:

Enter the `/usr/apl/gapl/home/.elecrc` file with `vi`. Change the `CADDSPATH` entry to this:

```
setenv CADDSPATH '/usr?/apl/cadds:/usr?/apl/cadds/data:
/usr?/apl/cadds/data/modtab: /usr?/apl/cadds/bin:/usr/cadds/parts=C'
```

---

Note that the Gateway create directory is specified by `/usr/cadds/parts=C`. If you want to use a different directory for your Gateway parts, change this entry. If you want the current working directory to be the create directory, specify `$cwd=C`.

Comment out the CADDSHOST line (that is, place a pound sign (#) in the first position in the line).

6. Edit the `/usr/apl/gapl/scripts.e/gateway` file; change the set path line for Gateway to

```
set path = (/usr?/apl/cadds/bin $path)
```

7. Copy the template `.elecrc` file to each user's home directory and give the user ownership as follows:

```
cp /usr/apl/gapl/home/.elecrc -username
/etc/chown username -username/.elecrc
```

Add the following line to the user's `.cshrc` file:

```
limit stacksize 40m
```

8. Log out of the system. Log back in as a user. Execute the gateway command:

```
% gateway
```

Turn to the *Electromechanical Gateway User Guide* for instructions on use.

# Installing Applications

---

## Installing PDM Client

---

This section tells you how to install PDM Client software on a CADDStation. PDM Client enables a user on the CADDStation to access and store PDM files on a VAX.

The following software must be installed:

- PDM Version 4.0 on the VAX.
- An `nsm.config` file on the VAX.
- For access to PDM Client CADD commands (GET/PUT), the CADDStation must have local or remote access to CADD, Revision 3.3 or later.
- If the CADDStation also stores parts on a CDS 4000 or on an IBM, then DDF software must be installed.

Instructions for installing PDM on the VAX and for creating the `nsm.config` file are in the *Installing VMS Product Data Manager*.

## Loading the PDM Client Tape with tar

To load the PDM Client tape, insert the tape in the tape drive, become root, change to the root directory, and run the `tar` command:

```
% su root
cd /
tar xvf /dev/rmt0 (or /dev/rst0 if the system has a 1/4-inch tape drive)
```

Check that your `/usr/apl/cadds/scripts/assemblecadds` script has an entry in it for `/usr/apl/pdm/lib/limnsm.a`. Check that `/usr/apl/pdm/lib` directory has the `limnsm.a` file in it. Run `assemblecadds`.

```
/usr/apl/cadds/scripts/assemblecadds
```

## Files on the PDM Client Installation Tape

The installation tape includes the following:

```
/usr/apl/pdm/bin contains executable commands and scripts.
/usr/apl/pdm/data contains message tables and help files.
/usr/apl/pdm/lib contains libraries.
/usr/apl/cadds/bin/ddfs contains ddf software.
```

## Setting Up the User's Environment

Each user's path must include the `/usr/apl/pdm/bin` directory. Add this line to each user's `.cshrc` file:

```
set path=($path /usr/apl/pdm/bin)
```

Include the following line in each user's `.logout` file:

```
source rmgdata
```

---

The `rmgdata` script cleans up leftover memory segments if the user logs out without executing the `signout` command.

### Edit the `pm.config` File on the CADDStation Client

Edit the `/usr/apl/pdm/data/pm.config` file. The `pm.config` file points to the process manager. Ensure that this file on the CADDStation exactly matches the `pm.config` file on the VAX (`PDM$DATA:PM.CONFIG`).

### Edit the `nsm.config` File on the VAX

Edit the `nsm.config` file on the VAX PDM server. Each PDM Client node must have its own entry. A sample `nsm.config` file entry for a PDM Client is

```
NODE (client-node-name)
 ALIAS (client-node-name)
 USER (PDMNODE=VAX/PDM-server-name)
 DOMAIN (PDM)
 ALIAS (pdm, PDM)
 AE (PDMUSER)
 MAXINST (6)
 CLOSE
```

If you want to use PDM Client CADDs commands on this node, add:

```
AE (CADDs)
 MAXINST (6)
 CLOSE
```

### Bringing Up the CADDs Requester Daemon

There must be an active CADDs requester daemon (`caddsr`) on each server that runs CADDs.

The daemon must be listed in the `/etc/services` file as:

```
caddsr 2011/udp #CADDs-PDM requester daemon
```

To activate `caddsr` at system startup, include it in the `/etc/rc.local` file:

```
if [-f /usr/apl/pdm/bin/caddsr]; then
 /usr/apl/pdm/bin/caddsr & echo 'caddsr daemon'
>/dev/console
fi
```

If you want to bring up `caddsr` with trace enabled, use the `-t` option:

```
caddsr -t
```

By default, `caddsr` uses the Process Manager's default configuration file, `/usr/apl/pdm/data/pm.config`. If you want to use another file to name the Process Manager, set the `ANSPATH` environment variable to the full path of the configuration file. For example

```
setenv ANSPATH /usr/testdir/pm.config
```

**Appendixes**

## PROM Monitor

# A

This appendix explains how to boot UNIX manually and lists Programmable Read Only Memory monitor messages. On the central processor unit (CPU) board of your Computervision workstation are a set of ROMs that contain a program called the PROM monitor. The PROM monitor controls any operation performed on your system before the UNIX kernel takes control.

Subsections in this appendix cover the monitor's start-up and bootstrap functions. Under normal circumstances, the monitor automatically boots the UNIX system. This means that after initial power-on, no manual intervention is required. These sections describe how the monitor automatically bootstraps UNIX and how to boot manually when necessary.

### Note

*Interpreting System Messages* lists messages that the monitor and boot program can display. These are useful for troubleshooting.

## A.1 Power-on, Self-test Procedures

When you first power on your system, the monitor runs a quick self-test procedure that can have one of these results: (1) no errors are found and system begins automatic boot process; (2) noncritical errors are reported and system begins the automatic boot process; (3) critical errors are found, screen remains dark (contact Field Service); or (4) no video board is found (to check serial ports, see the *CADDStation User Guide*).

When self-test finds no errors, this display results when you power on your workstation:

```
Self Test completed successfully.
Workstation, Model model number, type of keyboard.
ROM Rev N, some number MB memory installed
Serial #some number, Ethernet address n:n:n:n:n
Auto-boot in progress...
```

Noncritical errors result in a display like the following:

```
Self Test found a problem in something
Wrote wdata at address addr, but read rdata
Damage found, damages
Workstation, Model model number, type of keyboard.
ROM Rev N, some number MB memory installed
Serial #some number, Ethernet address n:n:n:n:n
Auto-boot in progress...
```

Where:

*something* malfunctioning part of system (see summary in "damages")  
*wdata* data expected when system is functioning normally  
*addr* address where data was read/written: for memory errors, this is a physical memory address; for other errors, address interpretation depends on *something*  
*rdata* data, read back from *addr*, found invalid because it is not same as *wdata*  
*damages* list of all subsystems found to have errors and information about last error

## A.2 Boot Procedures

The next two subsections show the automatic boot procedure and the alternative boot procedures available.

### A.2.1 Automatic Boot Procedure

The monitor immediately tries to boot from a default device:

```
Auto-boot in progress,
Boot: disk (0,0,0)vmunix
Load: disk (0,0,0)boot
Boot: disk (0,0,0)vmunix,
Size: 215040+24576+30916 bytes
UNIX 4.2, etc...
```

Where:

*disk* Device name of the local or network disk.  
*vmunix* File booted from *disk*; *vmunix* does not have to contain a UNIX kernel, it can contain any program as long as the disk is in standard UNIX file system format.

It is also possible to set up the disk to boot a small program which need not be in a UNIX file system. This above discussion assumes the disk is set up for UNIX.



## A.2.2 Booting from Specific Devices

You can boot your workstation from a logical disk partition, a network disk partition, or a local tape drive. (The monitor automatically attempts to boot **vmunix** from a default disk.) To boot a different program or from a different device, abort automatic boot process with L1-A. To determine devices your monitor ROMs are able to boot from at the > prompt, enter **b ?** command. Devices are listed (best to worst). Monitor boot command looks like:

> **b device(parameters)pathname args**

Where:

*device* Type of hardware to boot from.  
*parameters* Specify device address or partitioning.  
*pathname* Name of the actual file (in a UNIX file system on that device) to boot into memory.  
*args* Optional arguments to the program.

### To Boot from a Disk Drive:

> **b controller(address,drive,partition)pathname args**

Where:

*controller* Name of disk controller running specific disk: **xy** (SMD), **sd** (SCSI) or **ip** (other).  
*address* Physical address of controller on the Multibus.  
*drive* Unit number of disk on specific controller.  
*partition* Number corresponding to logical disk partition where file specified by *pathname* can be found (where zero = partition a, 1 = b, etc.).

### To Boot from a Network Disk:

> **b controller(address, hostnumber, partition)pathname args**

Where:

*controller* Device abbreviation for Ethernet Controller: **ec** (3COM), or **ie** (SUN-2)  
*address* Physical address of controller on the Multibus.  
*hostnumber* Unique number (0-255) assigned to each machine on local network .  
*partition* Desired public partition on server (see */etc/nd.local* file).

### To Boot from Tape:

> **b tape (controller,unit,filenum)**

Where:

*tape* Device abbreviation for tape controller: **mt** (9-track), or **st** (SCSI).  
*controller* Multibus address of controller.  
*unit* Tape drive to be used.  
*filenum* Which file of tape is to be booted (where: 1st file = #0, 2nd = #1, etc.).

Monitor ignores supplied value of *filenum* and can only boot the first file on a tape. To boot a file further down the tape, use monitor to boot "boot" program. CADDSystem software tapes always have the "boot" program as 1st file of tape.

### To Boot Files from the Default Device:

> **b pathname args**

This is useful for booting stand-alone utility programs after your disk is loaded, or for trying new versions of the UNIX kernel.

## Installing UNIX on a Tapeless System



This appendix walks you through the remote installation of UNIX across the Ethernet and onto a stand-alone workstation that does not have a tape drive. This allows the workstation to use the tape drive on the remote host. Refer to *Administering the Network* for background information on networking.

Throughout this appendix, reference is made to the remote host and target machines. The remote host (a workstation or file server) is the machine WITH the tape drive. The target is the machine WITHOUT the tape drive. The target uses the tape drive on the remote host.

UNIX software must be completely installed on a CADDStation System equipped with a tape drive (your remote host system) if you wish to install UNIX over the network. See Sections 2—3 of this manual for instructions.

### Note

The remote host must be running this release of CADDStation Systems Software and must be configured either as a server or as a stand-alone system; it may not be a client. If configured as a stand-alone, the system must “look” like a network disk server for remote installation. You can make the system look like a network disk server by including these device description lines in its kernel configuration file:

```
pseudo-device ether
pseudo-device nd
```

The remote host must have at least 5MB of free disk space (in the /pub partition if a server, or in the /usr partition if a workstation).

## Overview

These steps are defined in this appendix:

1. Complete UNIX installation on your remote host (Sections 1–5 of this book). Be sure that the remote host is configured as a server or as a stand-alone and has device description pseudo-device `nd` and pseudo-device `ether` lines included in its system configuration file.
2. If your remote host is configured as a stand-alone system you must enable it as a server and turn its `/usr` file system into a public network disk (unnecessary if remote host is configured as a server).
3. Make the Ethernet and Internet addresses for both the remote host and the target machine available to the networking software.
4. Start the reverse-ARP daemon.
5. Edit `/.rhosts`.
6. Determine the unit number of the `/pub` partition.
7. Link to the proper `tftpboot` file.
8. Determine the network information necessary for installation.
9. Load Mini UNIX onto remote host's `/pub` partition from the systems software tape.
10. Boot `diag` over the network; run `diag` to format (if necessary) and label your disk.
11. Boot the stand-alone `copy` program over the network. Run `copy` to copy a Mini UNIX system over the network into the swap area on your disk.
12. Boot the Mini UNIX system.
13. Run `setup` to install UNIX from tape; initialize the network files.
14. Boot the Full UNIX system.

### Note

Some procedures for installing UNIX on your remote system are identical to those previously described in Sections 2 and 3 for installing UNIX with tape support. In these cases, you are referred to the previous subsections in this manual.

## Setting Up the Remote Host

Complete steps 1 and 2 in this procedure only if the remote host is NOT a network server. If the remote host is a server, skip steps 1 and 2, perform the symbolic link in step 3, and load the Mini File System.

1. If remote host machine is not a network disk server, turn /usr file system into a public network disk by adding these two lines to /etc/nd.local to reference either /dev/xy0g (for a server), or /dev/sd0g or /dev/sd1g if /usr is mounted on second disk (for a workstation):

```
user 0 0 /dev/disk0g 0 -1 -1 Whichever is picked above.
son
```

2. Enable network disk server and edit /etc/nd.local by typing:

```
cd /dev
MAKEDEV ndlx
```

Where *x* = any single digit number that represents the number of users on that networking disk.

```
/etc/nd - < /etc/nd.local
```

3. To make the /usr disk into a public disk so it can be accessed (across the network and otherwise), enter this sequence of commands:

```
mkdir /usr/stand Enter to make the /usr/stand directory.
cp /stand/* /usr/stand Copy everything in /stand to /usr/stand.
ln -s /usr /pub Symbolically link from /usr to /pub.
cp /boot /pub/boot Copy boot program to /pub partition so you
 can boot across the network.

cd /usr/mdec
installboot bootnd /dev/disk0g Whichever is picked above.
sync Proceed with the next step in subsection B.2.
```

## Making Ethernet and Internet Addresses Available to Network Software

1. Be sure that the Ethernet and Internet addresses for the target and remote machines are known to the networking software. If you are using the yellow pages, add the address information to the yp data bases on the yp master server. If you are not using yellow pages, add the Internet addresses to the file /etc/hosts and the Ethernet addresses to the file /etc/ethers. For example, if you are not using yp and have the following configurations:

|                |            |               |              |
|----------------|------------|---------------|--------------|
| Remote Host    | tapeserver | 192.9.200.100 | 8:0:20:0:0:1 |
| Target Machine | tapeless   | 192.9.200.101 | 8:0:20:0:0:2 |

Make sure /etc/hosts contains these lines:

```
192.9.200.100 tapeserver
192.9.200.101 tapeless
```

Make sure /etc/ethers contains these lines:

```
8:0:20:0:0:1 tapeserver
8:0:20:0:0:2 tapeless
```

## Making Ethernet and Internet Addresses Available to Network Software (cont)

2. Start the reverse-ARP daemon. Its arguments are the Ethernet interface name and host name. The Ethernet interface is `ie0` for SUN Ethernet board or `eco` for 3COM board. For example, if remote host's name is `tapeserver` and it has a SUN Ethernet board, the command is

```
/usr/etc/rarpd ie0 tapeserver
```

3. Add the target machine's host name to the `/.rhosts` file. This enables the target machine to execute remote commands on the remote host machine.
4. Determine the unit number of the public partition being used for remote booting. This number is used in the next step and is referred to as `pub#`. If the remote host is a stand-alone, `pub#` = unit zero.

If the remote host is a server, you must look in `/etc/nd.local` to find the unit number. If the server is serving only one architecture, look for a line beginning with the words "user 0," and the unit number is the number immediately following "user 0."

```
user 0 1 /dev/xy0f 0 -1 -1 (Where unit number = 1)
```

If the server is serving multiple architectures, there is more than one line beginning with "user 0." Use the public partition that serves the same architecture as the target machine. Use `/etc/mount` to determine the device name associated with each `/pub.*` file system, and then look for a line that is on the appropriate device name and begins with "user 0." The unit number is the number immediately following the words "user 0." For example, if the output of the `/etc/mount` command is:

```
/etc/mount
/dev/xy0e on /pub.MC68010 type 4.2 (rw)
/dev/xy0f on /pub.MC68020 type 4.2 (rw)
```

and the `/etc/nd.local` file contains the following lines:

```
user -0 0 /dev/xy0e 0 -1 -1
user 0 1 /dev/xy0f 0 -1 -1
```

then the unit number for the MC68010 (Sun2) public partition is 0 and the unit number MC68020 (Sun3) public partition is 1.

## Making Ethernet and Internet Addresses Available to Network Software (cont)

5. Create a link to the proper tftpbooting file in the directory `/tftpboot`. If the architectures of the target machine and the remote host differ, the remote host will not have the proper tftpbooting files (e.g., if the remote host is a Sun2 and the target machine is a Sun3, the remote host will have tftpbooting files for Sun2s only. In this case, you must obtain Sun3 tftpbooting files from another Sun3 or from the Sun3 installation tapes). If there is another Sun3 on the network that is running Release 3.0, issue this command:

```
rcp machine:/tftpboot/ndboot./* \tftpboot
```

If there is not another sun3, then the files must be obtained from the installation tapes (see Appendix G). Position the tape to the *pub files* and use the `tar` command to extract the `/tftpboot` directory. Remember that to position a tape to file *n*, you must forward space the tape *n-1* files. For example, if the *pub files* in the eighth tape file, issue the following commands:

```
cd /
mt -f /dev/nrtape0 rew
mt -f /dev/nrtape0 fsf 7
tar xfvbp /dev/nrtape0 126 ./tftpboot
```

Now create the link. The name of the link = target machine's Internet address converted to hexadecimal (using all capital letters). Use `adb(1)` to convert the Internet address to hexadecimal. For example, if Internet address = 192.9.200.100:

```
% adb
0t192=X c0
0t9=X 09
0t200=X c8
0t100=X 64
^D
%
```

Therefore, the file name for Internet address 192.9.200.100 is C009C864. Note that the letters must be capitals. The link must be to a file that is appropriate for the architecture of the target machine. If the target machine is a Sun3, the link should be made to `ndboot.sun3.pub0` or `ndboot.sun3.pub1`; if the target is a Sun2, the link should be made to `ndboot.sun2.pub0` or `ndboot.sun2.pub1`. If *pub#* is zero, use the file ending with `pub0`, and if the *pub#* is one, use the file ending with `pub1`. For example, if the target machine is a Sun3 and the *pub#* is zero, the link command would be:

```
cd /tftpboot
ln -s ndboot.sun3.pub0 C009C864
```

## Making Ethernet and Internet Addresses Available to Network Software (cont)

- Files for remote booting must be installed on the public partition being used for booting. There are several possible scenarios involved. The remote host may be either a server or a stand-alone machine, and the architectures of the target machine and remote host may, or may not, be the same. In the following sequences of commands, *pubarch* is the directory name of the public partition being used for booting, (typically */pub.MC68010* or */pub.MC68020*); *machine* is the another machine with same architecture as target machine (if there is no other machine on the network with the same architecture as the target machine, the files must be obtained from the installation tapes); *pub\_partition* is the disk controller abbreviation, disk unit number, and partition letter of partition being used for booting (e.g., *xy0d*); *bootfile* is the */pub/boot* file if the machine is a server, and *bootfile* is the */boot* if the machine is a stand-alone.

If the remote host is a server and architecture being served by the public partition is the same as the target machine's architecture, then all the files are in place, and you may skip the rest of this step. If the remote host is a server and the architectures differ, the files are in place, but they are for the wrong architecture. The files must be replaced by the correct ones. The correct files can be obtained from another machine on the network of the appropriate architecture or they may be obtained from the installation tapes. The first example shows how to obtain them from another machine.

### Example 1

```
cd /pubarch
mv stand stand.orig
mv boot boot.orig
mkdir stand
rcp machine:/stand/diag stand
rcp machine:/stand/copy stand
rcp machine:/bootfile /pubarch/boot
rcp machine:/usr/mdec/bootnd /tmp
cd /usr/mdec
installboot /tmp/bootnd /dev/pub_partition
sync
#
```

### Example 2

If the remote host is a stand-alone machine and its architecture is the same as the target machine's architecture, issue the following commands.

```
cp /stand/diag /usr/stand
cp /stand/copy /usr/stand
ln -s /usr /pub
cp /boot /pub/boot
cd /usr/mdec
installboot bootnd /dev/pub_partition
sync
#
```

## Making Ethernet and Internet Addresses Available to Network Software (cont)

### Example 3

If remote host is a stand-alone machine with architecture different from the target machine's architecture, you must obtain files appropriate for the target machine. The following example shows how to obtain them from another machine.

```
cd /usr
mv stand stand.orig
mkdir stand
rcp machine:/stand/diag stand
rcp machine:/stand/copy stand
ln -s /usr /pub
rcp machine:/bootfile /pub/boot
rcp machine:/usr/mdec/bootnd /tmp
cd /usr/mdec
installboot /tmp/bootnd /dev/pub_partition
sync
```

### Determining Network Information

For later phases of remote installation, you need to know the remote host's number and the target's hardware Ethernet address.

1. To determine the remote host's hexadecimal number, find its entry in its own `/etc/hosts` file. Recall that entries consist of a machine's full Internet address (network number followed by host number) and name, for example:

```
192.9.200.48 augustus
192.9.200.50 julius
192.9.200.52 claudius
```

Here, julius' Internet address is 192.9.200.50; its network number is 192.9.200; and host number (in decimal) is 50. Remember the Internet address; you will need it during setup. If you are using the yellow pages, you can find the Internet address with `ypmatch julius hosts`.

Since host numbers in `/etc/hosts` are expressed in decimal and you need the remote host's number in hexadecimal, you need to convert. Use `adb(1)` for this:

```
% adb
0host number in decimal = X
host_number_in_hex
^D
%
```

2. Obtain the hardware Ethernet address of the target by powering up the target workstation. Abort the auto boot (explained in Section 1) and copy down the displayed Ethernet address.



## Loading the Mini UNIX System on the Remote Host

Now load the Mini File System onto the public portion of the disk from the boot tape with the following sequence of commands. (This takes about 3 minutes using a 1/2-inch tape; and about 6 minutes with a 1/4-inch cassette.)

```
mt -f /dev/nrtape0 rew Replace tape with mt (for 1/2-inch tape) or
mt -f /dev/nrtape0 fsf 5 st (for 1/4-inch tape).

dd if=/dev/nrtape0 of=/pub/minifs bs=blk_factor
 Where block factor = bs=20b for 1/2-inch
 tape or bs=126b for 1/4-inch, pub = pub if
 the remote host is a stand-alone,
 pub.MC68010 if remote host is a 68010
 server, and pub.MC68020 if remote host is a
 68020 server.

sync
#
```

## Using diag to Label the Target Machine's Disk

Now, you start to work on your target machine and install UNIX from the remote host. The first step is to label your target's disk(s) with *diag* utility. Procedures for using *diag* in this remote installation are identical to those in Section 2 of this book, except you are booting *diag* from your remote host instead of from the system's software distribution tape. Start with the following command; then, if you are starting with a completely new disk, follow the appropriate labeling procedure in Section 2.

```
> b e_interface (0,host_number,0)stand/diag Enter command (replace e_interface with
 Ethernet controller abbreviation; host_number
 with remote host's number in hex; and 0 with
 unit number in /etc/nd.local file that
 corresponds to appropriate /pub partition).
```

Now label your disk (as shown in Section 2). Then load and boot *vmunix* as shown below.

## Loading/Booting vmunix

After labeling your disk(s), you are ready to load the *vmunix* from the remote host to your disk. To do this, use the stand-alone copy program, which you boot from the remote host.

```
>b e_interface (0,host_number,0)stand/copy Boot the stand-alone copy program.
Standalone Copy
From: e_intface(0,host_number,0)minifs Enter source and destination of copy.
To: disk(0,0,1) (Where disk = sd for workstation; xy for
 server.) After several minutes the mini file
 system is loaded into swap area of disk.

Copy completed

> b e_interface(0,host_number,0)boot -a Boot the main boot program.
Boot: disk(0,0,1)vmunix -as Boot UNIX in single user state (-a = ask me
 option, s = come up single user).

root device? disk0* Enter root file system device (disk0* = xy0*
 for a server; sd0* for workstation).

WARNING: clock gained XXXXX days--CHECK AND RESET THE DATE!
Use date(1) command at this prompt.
```

## Using setup/Reinstalling Original Files

At this point, proceed to Section 3 in this book to invoke the `setup` program.

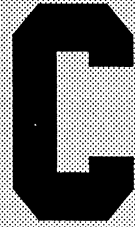
### Note

Remember to select "remote" tape location in `setup`.

If your remote host is a server and if earlier you obtained booting files from another system or the installation tapes, you should now reinstall the original files. In the following commands, replace `/pubarch` with `/pub.MC68010` or `/pub.MC68020`; and `pub_partition` with disk controller abbreviation, disk unit number and partition letter of partition used for booting (e.g., `xy0d`).

```
cd /pubarch
rm -rf stand
mv stand.orig stand
rm boot
mv boot.orig boot
cd /usr/mdec
installboot bootnd /dev/pub_partition
sync
#
```

## Upgrading UNIX Software



This appendix describes the process of upgrading system software. You will refer to it whenever you receive a new revision of the software.

Regardless of the version of the system you are running, when you upgrade your software, the operating system (**root**) and the **/usr** file systems will be rebuilt. You should save a few groups of files from the current system before installing the new system software. After the upgrade, these files will save you time (1) getting the system running on the network and (2) obtaining the same configuration and protection. At the end of the installation procedures, you will also be saving and restoring files in user's home directories.

The easiest way to upgrade the software is to:

1. Save the important files on your existing system. (Urge system users to remove any unnecessary files before you save their directories on tape.)
2. Perform a bootstrap of the distribution tapes as if you were installing the software release on a brand new machine (i.e., perform the procedures in Sections 2 through 5). Note that you probably need to run one surface analysis pass when formatting (unless you want to repartition your disk or you suspect disk corruption).
3. Then restore the saved files to the new system.

The following material describes the above procedures for upgrading software to a new release level.

## Step 1: What to Save

Table C-1 lists the standard set of files you should save (IN ADDITION TO ALL USER FILES) and indicates directories in which site-specific files might be present. This list will probably be augmented with nonstandard files you have added to your system.

Table C-1. Files to Save When Upgrading

| File                                 | Contents                                               |
|--------------------------------------|--------------------------------------------------------|
| <code>/.login</code>                 | root login start-up script                             |
| <code>/.profile</code>               | root sh login start-up script                          |
| <code>/.cshrc</code>                 | root csh start-up script                               |
| <code>/.rhosts</code>                | symbolic link to <code>etc/hosts.equiv</code>          |
| <code>/dev/MAKEDEV.local</code>      | for the LOCAL case for making devices                  |
| <code>/etc/fstab</code>              | disk configuration data                                |
| <code>/etc/gettytab</code>           | tty port speeds data base                              |
| <code>/etc/group</code>              | group data base                                        |
| <code>/etc/hosts</code>              | host's data base                                       |
| <code>/etc/hosts.equiv</code>        | list of trusted hosts on your network                  |
| <code>/etc/nd.local</code>           | network disk local initialization file                 |
| <code>/etc/networks</code>           | list of Internet networks                              |
| <code>/etc/passwd</code>             | user data base                                         |
| <code>/etc/printcap</code>           | printer capability data base                           |
| <code>/etc/printcap.templates</code> | main printer file                                      |
| <code>/etc/rc</code>                 | system start-up file                                   |
| <code>/etc/rc.local</code>           | for any local additions                                |
| <code>/etc/remote</code>             | remote hosts description data base                     |
| <code>/etc/ttys</code>               | terminal line configuration data                       |
| <code>/etc/ttytype</code>            | terminal line to terminal type mapping data            |
| <code>/etc/termcap</code>            | for any local entries which may have been added        |
| <code>/private</code>                | diskless client private configuration files            |
| <code>/usr/include/*</code>          | for local subdirectory and any other additions         |
| <code>/usr/lib/aliases</code>        | mail forwarding data base                              |
| <code>/usr/crontab</code>            | cron daemon data base                                  |
| <code>/usr/lib/font/*</code>         | for locally developed font libraries                   |
| <code>/usr/lib/sendmail.cf</code>    | mail system configuration file                         |
| <code>/usr/lib/tabset/*</code>       | for locally developed tab setting files                |
| <code>/usr/lib/tmac/*</code>         | for locally developed <code>troff/nroff</code> macros  |
| <code>/usr/lib/uucp/*</code>         | for local <code>uucp</code> configuration files        |
| <code>/usr/local</code>              | for locally developed programs                         |
| <code>/usr/preserve</code>           | editor temporary file saved here after crashes/hangups |
| <code>/usr/spool/*</code>            | for current mail, news, uucp files, etc.               |
| <code>/usr/*</code>                  | all users' directories                                 |

1. Save the files listed in Table C-1 on a separate tape.
2. Make a tape of system files you will need to set up your system after the upgrade. Be sure to do a `tar` of the directories `/etc`, `/lib`, and `/usr/lib` so you do not miss anything the first time around. Do this by running the following commands:

```
cd /
tar c .??* dev/MAKEDEV.local etc lib usr/include usr/lib
```

### Step 1: What to Save (cont)

3. Make a tape containing users' files by changing to another BLANK TAPE, and running the following `tar(1)` command:

```
tar c /usr/{spool,usera,userb,usrc,userd...}
```

Replace *usera...* with the names of all users on your system. You can double check by looking in the `/etc/passwd` or by doing `ls /usr`. You may want to use these `tar(1)` options:

- `f` to specify which tape drive to use
- `b` to specify a large blocking factor
- `v` to list each file as it is processed

4. On another tape, save any special configuration files.
5. After saving the appropriate files in a convenient format, the next step is to dump all your file systems to magnetic tape with `/etc/dump` (see Section 4 of *Managing the System*, and `dump(8)` for more information). This tape is not used to rebuild the system; it is a backup measure to protect your file system in case of an emergency.
6. When you have completed your system dump, install the new release from the distribution tape. To install the new release, follow procedures described in this manual, Sections 2 through 5, with the following exception: you can find your network number and host number in the `/etc/host` file. The host number is the last number on the line. After installing UNIX from tape, proceed with "Step 2: Merging".

### Step 2: Merging

When your system is booting reliably and `root` and `/usr` file systems are fully installed, you are ready to proceed to the next step in the conversion process: merging your old files into the new system.

1. Using the first `tar` tape you created in "Step 1: What to Save", extract appropriate files into a scratch directory (to avoid writing over the newer file copy). For example:

```
mkdir /usr/convert
cd /usr/convert
tar xvpf /dev/rtape0 Where tape = st (1/4-inch) or mt (1/2-inch).
```

Next you can simply copy certain files, such as those from `/etc`, into place:

```
cp passwd group fstab ttys ttytype hosts hosts.equiv /etc
cp crontab /usr/lib
```

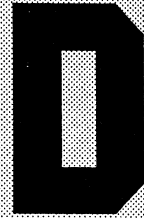
If you are on the network, and not on a server, change your `/etc/host` file to include another working system. Other files, however, must be merged into the distributed versions by hand. In particular, be careful with `etc/termcap`.

2. Now restore the spooling directories and user files (saved on the second `tar` tape).

```
cd /
tar xvpf /dev/rtape0 Where tape = st (1/4-inch) or mt (1/2-inch).
```

Be sure to use `tar`'s `-p` option in order to recreate files with same file modes. You may want to add other options, as described in item 3 of "Step 1: What to Save".

## Installing Applications from a Secured Tape



This appendix explains how to load secured applications from 1/4-inch or 1/2-inch tape to disk, using the get application command (`getappl`).

This security scheme is designed to prevent unauthorized copying of software via tape or network. It accommodates CADDs multiple applications tapes and individual applications products, as well as features a scheme for handling updates and replacements of bad or lost tapes.

This appendix also explains the use of Computervision's Software Installation Verification Procedure (SIV), which provides a means to verify what was installed on your system.

### Caution

Your Computervision tapes have been write-protected. Before you start loading, your tapes must be write-enabled (i.e., for 1/2-inch tape, insert the write ring; for 1/4-inch tape, switch the protection arrow away from SAFE). After loading, protect your tape and your software by removing the write ring or switching the protection arrow to SAFE. Store your tapes in a secure place.

## Getting Prepared

Before loading secured applications, you need to either change directory to `/usr/cvbin`, include the full pathname when you issue commands to the system, or make sure that a path is set to `/usr/cvbin`. Be sure you are logged on as the super-user.

Also, in order to load secured applications, you must have at least one application tape in your possession, dependent on which applications you are going to run: for non-CADDs applications, you may have one or two tapes; for CADDs you may have more than four. Besides application and CADDs tapes, you will also have a Software Installation Verification tape.

## Getting Prepared (cont)

Whatever the applications, CADDs or non-CADDs, your tapes have been created and loaded via standard CADDStation platform security.

For CADDs applications, the first tape is called the CADDs Configurable Security Tape, or CCS tape. The second and third tapes are called CADDs Object Tapes; they contain the CADDs .o files. The remaining tapes are called CADDs Additional File Tapes.

All other tapes are application tapes containing miscellaneous data, libraries, and object files for MD, AEC, and CAM applications. You also receive a Software Installation Verification (SIV) tape.

## Loading Procedures

In order to load any configuration of CADDs or any secured application, use the following procedures.

### Part 1: Get Application Procedures

In the following procedures, note the machine's name (mname), the root prompt (#), and that all user input is in bold-faced type.

#### Procedure 1: Installing All Applications from a 1/4-inch Tape

To install all applications from a 1/4-inch tape:

Mount the CCS tape if you are loading CADDs, or the first tape of your application, and type

```
mname# /usr/cvbin/getappl /dev/rst0
```

#### Note

The above example uses the complete pathname. If you have changed directories to /usr/cvbin or have set a path to /usr/cvbin, the command line and resulting screen display will be as follows:

```
mname# getappl /dev/rst0
```

```
tape read error: I/O error
getappl: error detected and corrected, program continues
```

(Ignore these messages. They only happen the first time.)

Continuing beyond this point will restrict application to run on this system only.

```
DO YOU WANT TO CONTINUE (y/n): y
```

```
Installing application 9001 onto directory /usr/apl ...
Installing application 9002 onto directory /usr/apl ...
Rewinding tape...
```

For non-CADDs applications, the loading process of getappl is completed. For CADDs go to Part 2 to continue loading CADDs.

## Procedure 2: Installing Selected Applications from a 1/4-inch Tape

If you plan to load only a few applications from Computervision's secured tape, for example, a plotter, you may want to use the interactive option (-i) of the get application command (getappl).

```
mname# /usr/cvbin/getappl -i /dev/rst0
```

```
Scanning tape, please wait...
```

```
Status of application on tape
```

```

Application : 1001
Recommended loading path : /
Expiration date : NONE
Initial/Update release : Initial
Rev. 3-00A, Ver. 00001
Application capable of running on 1 system(s)
```

```
Submenu of Options:
```

```

s) status of application
h) hosts, list systems capable of running application
x) extract application from tape
a) authorize application on disk
n) next application to be installed/authorized
m) menu--display this menu
q) quit
```

```
Enter submenu option: x (extracting the application)
```

```
Application 1001 is to be loaded into directory /.
Do you want to load from recommended loading path (y/n):y
Installing application 1001 onto directory / ...
```

```
Enter submenu option: q (quitting the get application utility)
```

```
Rewinding tape...
```

For non-CADDS applications, the loading process of getappl is completed. For CADDS go to Part 2 to continue loading CADDS.

## Procedure 3: Installing All Applications from a 1/2-inch Tape

If loading software onto a CADDServer, after you have mounted your 1/2-inch CCS tape (if you are loading CADDS), or the first tape of your application, again use the get application command. Again note the machine's name (mname), the root prompt (#), and that all user input is in bold-faced type.



## Part 1: Get Application Procedures (cont)

mname# /usr/cvbin/getappl /dev/rmt0

Scanning tape, please wait...

| appl num. | price list number | systems auth'd | systems inst'd | appl num. | price list number | systems auth'd | systems inst'd |
|-----------|-------------------|----------------|----------------|-----------|-------------------|----------------|----------------|
| 1)        | 1001              | 25             | 2              | 2)        | 1002              | 25             | 2              |
| 3)        | 1004              | 25             | 2              | 4)        | 1005              | 25             | 2              |
| 5)        | 1006              | 25             | 2              | 6)        | 2005              | 25             | 2              |
| 7)        | 2012              | 25             | 2              | 8)        | 2014              | 25             | 2              |
| 9)        | 2016              | 25             | 2              | 10)       | 2020              | 25             | 2              |
| 11)       | 2025              | 25             | 2              | 12)       | 2030              | 25             | 2              |
| 13)       | 2035              | 25             | 2              | 14)       | 2040              | 25             | 2              |
| 15)       | 2102              | 25             | 2              | 16)       | 2104              | 25             | 2              |
| 17)       | 2106              | 25             | 2              | 18)       | 2108              | 25             | 2              |
| 19)       | 2110              | 25             | 2              | 20)       | 2120              | 25             | 2              |
| 21)       | 2130              | 25             | 2              | 22)       | 2140              | 25             | 2              |
| 23)       | 2142              | 25             | 2              | 24)       | 2144              | 25             | 2              |
| 25)       | 2145              | 25             | 2              | 26)       | 2146              | 25             | 2              |
| 27)       | 2148              | 25             | 2              | 28)       | 2150              | 25             | 2              |
| 29)       | 2151              | 25             | 2              | 30)       | 2152              | 25             | 2              |
| 31)       | 2161              | 25             | 2              | 32)       | 2162              | 25             | 2              |
| 33)       | 2210              | 25             | 2              | 34)       | 2220              | 25             | 2              |
| 35)       | 2230              | 25             | 2              | 36)       | 2240              | 25             | 2              |
| 37)       | 2241              | 25             | 2              | 38)       | 2302              | 25             | 2              |
| 39)       | 2304              | 25             | 2              | 40)       | 2306              | 25             | 2              |
| 41)       | 2308              | 25             | 2              | 42)       | 2312              | 25             | 2              |
| 43)       | 2314              | 25             | 2              | 44)       | 2320              | 25             | 2              |
| 45)       | 2325              | 25             | 2              | 46)       | 2330              | 25             | 2              |
| 47)       | 2352              | 25             | 2              | 48)       | 2354              | 25             | 2              |
| 49)       | 2360              | 25             | 2              | 50)       | 2410              | 25             | 2              |
| 51)       | 2412              | 25             | 2              | 52)       | 2414              | 25             | 2              |
| 53)       | 2416              | 25             | 2              | 54)       | 2418              | 25             | 2              |
| 55)       | 2510              | 25             | 2              | 56)       | 2610              | 25             | 2              |
| 57)       | 2615              | 25             | 2              | 58)       | 2620              | 25             | 2              |
| 59)       | 2625              | 25             | 2              | 60)       | 2630              | 25             | 2              |
| 61)       | 2710              | 25             | 2              | 62)       | 3020              | 25             | 2              |
| 63)       | 3040              | 25             | 2              | 64)       | 3050              | 25             | 2              |
| 65)       | 3060              | 25             | 2              | 66)       | 3070              | 25             | 2              |
| 67)       | 3520              | 25             | 2              | 68)       | 3530              | 25             | 2              |
| 69)       | 3540              | 25             | 2              | 70)       | 3560              | 25             | 2              |

Menu of Options:

- l) list application(s) on tape
- a) add application(s) to installation list
- d) delete application(s) from installation list
- i) install selected application(s) from tape
- m) menu--display this menu
- q) quit without change

## Part 1: Get Application Procedures (cont)

Enter menu option: a

(You must add applications to the installation list before installing them.)

Enter a list of applications: 1-70

Enter menu option: l

| appl<br>num. | price list<br>number | systems<br>auth'd | systems<br>inst'd |   | appl<br>num. | price list<br>number | systems<br>auth'd | systems<br>inst'd |   |
|--------------|----------------------|-------------------|-------------------|---|--------------|----------------------|-------------------|-------------------|---|
| 1)           | 1001                 | 25                | 2                 | X | 2)           | 1002                 | 25                | 2                 | X |
| 3)           | 1004                 | 25                | 2                 | X | 4)           | 1005                 | 25                | 2                 | X |
| 5)           | 1006                 | 25                | 2                 | X | 6)           | 2005                 | 25                | 2                 | X |
| 7)           | 2012                 | 25                | 2                 | X | 8)           | 2014                 | 25                | 2                 | X |
| 9)           | 2016                 | 25                | 2                 | X | 10)          | 2020                 | 25                | 2                 | X |
| 11)          | 2025                 | 25                | 2                 | X | 12)          | 2030                 | 25                | 2                 | X |
| 13)          | 2035                 | 25                | 2                 | X | 14)          | 2040                 | 25                | 2                 | X |
| 15)          | 2102                 | 25                | 2                 | X | 16)          | 2104                 | 25                | 2                 | X |
| 17)          | 2106                 | 25                | 2                 | X | 18)          | 2108                 | 25                | 2                 | X |
| 19)          | 2110                 | 25                | 2                 | X | 20)          | 2120                 | 25                | 2                 | X |
| 21)          | 2130                 | 25                | 2                 | X | 22)          | 2140                 | 25                | 2                 | X |
| 23)          | 2142                 | 25                | 2                 | X | 24)          | 2144                 | 25                | 2                 | X |
| 25)          | 2145                 | 25                | 2                 | X | 26)          | 2146                 | 25                | 2                 | X |
| 27)          | 2148                 | 25                | 2                 | X | 28)          | 2150                 | 25                | 2                 | X |
| 29)          | 2151                 | 25                | 2                 | X | 30)          | 2152                 | 25                | 2                 | X |
| 31)          | 2161                 | 25                | 2                 | X | 32)          | 2162                 | 25                | 2                 | X |
| 33)          | 2210                 | 25                | 2                 | X | 34)          | 2220                 | 25                | 2                 | X |
| 35)          | 2230                 | 25                | 2                 | X | 36)          | 2240                 | 25                | 2                 | X |
| 37)          | 2241                 | 25                | 2                 | X | 38)          | 2302                 | 25                | 2                 | X |
| 39)          | 2304                 | 25                | 2                 | X | 40)          | 2306                 | 25                | 2                 | X |
| 41)          | 2308                 | 25                | 2                 | X | 42)          | 2312                 | 25                | 2                 | X |
| 43)          | 2314                 | 25                | 2                 | X | 44)          | 2320                 | 25                | 2                 | X |
| 45)          | 2325                 | 25                | 2                 | X | 46)          | 2330                 | 25                | 2                 | X |
| 47)          | 2352                 | 25                | 2                 | X | 48)          | 2354                 | 25                | 2                 | X |
| 49)          | 2360                 | 25                | 2                 | X | 50)          | 2410                 | 25                | 2                 | X |
| 51)          | 2412                 | 25                | 2                 | X | 52)          | 2414                 | 25                | 2                 | X |
| 53)          | 2416                 | 25                | 2                 | X | 54)          | 2418                 | 25                | 2                 | X |
| 55)          | 2510                 | 25                | 2                 | X | 56)          | 2610                 | 25                | 2                 | X |
| 57)          | 2615                 | 25                | 2                 | X | 58)          | 2620                 | 25                | 2                 | X |
| 59)          | 2625                 | 25                | 2                 | X | 60)          | 2630                 | 25                | 2                 | X |
| 61)          | 2710                 | 25                | 2                 | X | 62)          | 3020                 | 25                | 2                 | X |
| 63)          | 3040                 | 25                | 2                 | X | 64)          | 3050                 | 25                | 2                 | X |
| 65)          | 3060                 | 25                | 2                 | X | 66)          | 3070                 | 25                | 2                 | X |
| 67)          | 3520                 | 25                | 2                 | X | 68)          | 3530                 | 25                | 2                 | X |
| 69)          | 3540                 | 25                | 2                 | X | 70)          | 3560                 | 25                | 2                 | X |

Menu of Options:

Enter menu option: i

Rewinding tape, please wait...

Scanning tape, please wait...

## Part 1: Get Application Procedures (cont)

Installing application 1001 onto directory /...  
Installing application 1002 onto directory /...

(Installs all of the applications that were added to the installation list through menu option a into the server.)

Installing application 3530 onto directory /...  
Installing application 3540 onto directory /...  
Installing application 3560 onto directory /...

Rewinding tape...

### Note

If loading CADDSS applications from a 1/2-inch tape, refer to Part 2. If you are going to load multiuser CADDSS, finish Part 2 and continue on to Part 3. If you are not loading CADDSS, you have finished with the loading process.

## Procedure 4: Installing Selected Applications from a 1/2-inch Tape

Similar to Procedure 3, if you want to look at the authorization for options already installed, or install applications into a directory other than the recommended directory, or to only load a few applications, use the interactive option of `getappl`. As in the previous 1/2-inch tape example, you see first a listing of all of the applications on your installation tape. However, after choosing the `i` menu option, note the following screen displays:

```
Enter menu option: i
Rewinding tape, please wait...
Scanning tape, please wait...

Status of application on tape

Application : 2710
Recommended loading path : /usr/apl
Expiration date : NONE
Initial/Update release : Initial
Rev. 1.00-A, Ver. 85001
Application capable of running on 3 system(s)

Submenu of Options:

s) status of application
h) hosts, list systems capable of running application
x) extract application from tape
a) authorize application on disk
n) next application to be installed/authorized
m) menu--display this menu
q) quit
```

## Part 1: Get Application Procedures (cont)

Enter submenu option: x  
Application 2710 is to be loaded into directory /usr/apl.  
Do you want to load from recommended loading path (y/n): n  
Enter FULL PATHNAME of alternative path: *The pathname to your selected directory.*  
Installing application 9001 onto directory *path\_name* ...  
Enter submenu option: q  
Rewinding tape...

### Note

If loading CADDs applications from a 1/2-inch tape, refer to Part 2. If you are going to load multiuser CADDs, finish Part 2 and continue on to Part 3. If you are not loading CADDs, you are finished with the loading process.

## Part 2: Continuing the CADDs Installation

After you have finished loading your 1/4-inch or 1/2-inch CCS tape, continue with the following procedures. If you have not used any Part 1 procedures, refer to Part 1 before attempting the following.

### Phase One: Restoring CADDs

Load the first CADDs Object Tape and begin the CADDs Restore Procedure by typing

```
mname# /usr/apl/cadd/scripts/restorecadd ✓
```

CADDs Restore Procedure

This procedure restores the CADDs application tapes which you have received. You should have already loaded the CCS tape.

You should have the CADDs application tapes available at this time. If you do not have them, answer 'n' to the first question.

Do you have a CADDs tape to restore? (default = y; else done)

y

Is it a 1/2-inch tape? (default = y; else 1/4-inch tape)

n (If using a 1/4-inch tape.)

Is the tape to be restored loaded? (default=y; else abort)

y

x tapedir, 21 bytes, 1 tape blocks

Beginning Tape Restore

Tape Restored

## Part 2: Continuing the CADD5 Installation (cont)

Do you have another CADD5 tape to restore? (default = y; else done)  
n

### Note

If you have other CADD5 tapes to restore, answer y or enter a RETURN.

Exiting CADD5 Restore Procedure

If you have configurable CADD5, then execute 'assemblecadd5'  
to link together the CADD5 applications just restored.

If you have prebuilt CADD5 (85MB stand-alone workstations only), you are done.

## Phase Two: Assembling CADD5

After all tapes have been loaded, you must create an executable CADD5 program. To do this, type in the following:

```
mname# /usr/apl/cadd5/scripts/assemblecadd5
```

```
Beginning load of CADD5--Approximately 30 minutes
Potential jump across page boundary; reloading CADD5
End of load of CADD5
```

```
mname#
```

### Note

If you receive a message similar to f77: not found, you have not loaded the Fortran Compiler Libraries. You will need to load the Fortran Compiler Libraries in order to run CADD5. To load these libraries, do the following:

1. Load your second UNIX tape.
2. Key in the following

```
mname# /usr/etc/extract_release tape type fortran
```

```
tape = 1/2-inch (mt) or 1/4-inch (st)
type = 'tapeful' or 'tapeless servername'
```

## Phase Three: Removing the .o Files

After you have assembled your CADD5 object files, remove all of the .o files by doing the following:

```
mname# cd /usr/apl/cadd5
mname# rm -r src lib
```

## Phase Four: Loading CADDs Additional Files

After removing the .o files, mount the CADDs Additional Files Tapes and load them onto your system via the `restorecadds` utility:

```
mname# /usr/apl/cadds/scripts/restorecadds
```

For CADDs applications, the loading process of `getappl` is finished at this point. However, it is suggested that you conduct a Master Software Backup of your CADDs directories. For information concerning such backups, see Part 4 of *Managing the System*.

## Part 3: Installing Multiuser CADDs

The following procedure is used to load CADDs on a CADDServer that has workstations running multiuser CADDs from it. If you have already covered Parts 1 and 2, begin with step three of this process.

1. Using `getappl`, load the CCS tape on the CADDServer

```
mname# /usr/cvbin/getappl /dev/rmt0
```

Follow Part 1, Procedure 2 for `getappl` instructions.

2. Restore and Assemble CADDs on the server through the following:

```
mname# /usr/apl/cadds/scripts/restorecadds
```

and after the restore procedure is finished...

```
mname# /usr/apl/cadds/scripts/assemblecadds
```

Follow instructions in Part 2 for these commands and subsequent procedures.

3. Next issue the following command on the server:

```
mname# /usr/apl/cadds/bin/netroot on
```

4. Mount the CCS security tape on the server in order to authorize CADDs onto your workstations.

On each workstation, check `/etc/fstab` to see if your `/usr` file system is read-only. If it is, change it to read-write and reboot your workstation. Once your workstation is back up and running, do the following:

```
mname# /usr/cvbin/getappl servername:/dev/rmt0
```

Then use the `a` option to add the applications to the list and the `i` option to install the applications.

Repeat this process for each workstation that you want CADDs to run on.

5. After loading all workstations, on the server issue the following command:

```
mname# /usr/apl/cadds/bin/netroot off
```

### Part 3: Installing Multiuser CADD5 (cont)

Now, if your CADD5 user is set up on each workstation, you can log in as `cadd5` and access the CADD5 software you have just loaded onto your system. However, make sure the CADD5GPU process is running on your server before entering CADD5 on your workstations.

#### Note

Complete the authorization of all workstations using the `getappl` command before beginning a CADD5 session on any workstation in a multiuser configuration. Starting a session while authorizing a workstation will fail because the CADD5GPU `-hard` process will be active.

If you wish to add a workstation authorization at a later date and end all active CADD5 sessions, kill the CADD5GPU process on the CADDServer with the command:

```
mname# kill -9 processnumber
```

Then complete the `getappl` process.

### Part 4: Installing CADD5 on a Tapeless Workstation via the Network

Before you begin, you need the answers to two questions:

- What is my *base\_directory*?
- How much space do I have on my CADDServer disks?

You need the full pathname of your *base\_directory* in order to successfully perform a tapeless installation. And if you do not have enough room on your CADDStation disks, you can not load CADD5 on to them.

#### Base\_Directory

Your *base\_directory* is where `../cadd5` is located on your server. To find its location, do the following:

```
server# cd /
server# cd /usr/apl/cadd5
server# cd ..
server# pwd
```

You will receive one of the two answers:

1. An error message: No such file or directory
2. A full path name other than `/`.

If you received answer one, your *base\_directory* is `/`. Thus, do the following:

```
server# mkdir /usr/apl
```

The `/usr/apl` directory will be your *base\_directory*.

### Part 3: Installing Multiuser CADDs (cont)

If you received answer two, your *base\_directory* is the full pathname. For example

If `pwd` produced the following screen display:

```
/usr.MC68020/server/apl
```

Your *base\_directory* is `/usr.MC68020/server/apl`

#### CADDServer Disk Space

To find how much disk space your CADDServer has, issue the following UNIX command and note the subsequent screen display:

```
server# df
Filesystem kbytes used avail capacity Mounted on
/dev/number number number number nnnnn% /
/dev/number number number number nnnnn% /
server#
```

`df` displays the amount of disk space occupied by currently mounted file systems, the amount of used and available space, and how much of the file system's total capacity has been used.

In order for CADDs to run, you need 50MB of disk space in your *base\_directory*. Find the file system corresponding to your *base\_directory* and convert Kbytes into Mbytes (divide the number noted on your screen by 1000). If there is enough space, continue with the next step. If not, find a file system that does have enough space. Link `/usr/apl/cadds` to that directory pathname. If you link, you should also reverify your base directory pathname as shown above. The following is an example of a link:

```
server# mkdir /usr.MC68020/apl
server# mkdir /usr.MC68020/apl/cadds
server# ln -s /usr.MC68020/apl/cadds /usr/apl
```

#### Procedure for Method 1

Method 1 is used for tapeless workstations with dual 85MB drives. It has the advantage of local software and better performance. It has the disadvantage of requiring greater disk resources on your workstation and a more complex installation process.

#### CADDServer Steps

The following steps should be done on your server:

1. If the CADDs software already exists on your server for alternate stand-alone or multiuser use, you must temporarily move it prior to starting the tapeless procedure.

```
server# mv base_directory/cadds base_directory/lcadds
```

2. You must have a tape that has been authorized for at least two systems.



### CADDServer Steps (cont)

3. Load CADDs on your server via Part 3 of Appendix D.
4. Down load *base\_directory/cadds* to your tapeless workstation.

```
server# (cd base_directory/cadds;tar cvfB -.)| \
 (rsh name "cd /usr/apl/cadds;tar xvfB -.")
```

Note: *name* is the name of your tapeless workstation; for example, *tapeless1*

5. Move your *asl* files into a unique directory.

```
server# cd /
server# mkdir base_directory/tapeless1
server# mkdir base_directory/tapeless1/bin
server# cp base_directory/cadds/bin/asl* base_directory/tapeless1/bin
server# chmod 666 base_directory/tapeless1/bin/asl*
```

The tapeless number or name of your station should be changed for each tapeless workstation you install.

6. Remove all files and directories under *base\_directory/cadds*.

```
server# rm -r /usr/apl/cadds
```

7. If you moved your original *cadds* to *lcadds* on your server, now move it back:

```
server# mv base_directory/lcadds base_directory/cadds
```

### CADDStation Steps

The following steps should be done on your tapeless workstation:

8. Mount *base\_directory/tapeless1/bin* on the server to */remote* on your tapeless workstation.

```
ws# mkdir /remote
ws# vi /etc/fstab

add:

server:base_directory/tapeless1/bin /remote nfs rw,hard 0 0

ws# mount -a
```

9. Remove all *asl* files on your tapeless workstation.

```
ws# rm /usr/apl/cadds/bin/asl*
```

10. Link to the server version of the *asl* files.

```
ws# ln -s /remote/asl* /usr/apl/cadds/bin
```

11. Create a CADDs user in the usual method.

12. Activate CADDs on your tapeless workstation.

```
ws# login cadds
```

## Procedure for Method 2

Method 2 can be used for both tapeless workstations with dual 85MB drives and tapeful workstations with single 85MB drives. It has the advantage of reduced local disk space requirements and a more simple installation procedure. It has the disadvantage of requiring greater disk resources on your server for each tapeless or single 85MB drive workstation, plus some possible performance degradation.

### CADDServer Steps

The following steps should be done on your server:

1. If the CADDs software already exists on your server for alternate stand-alone or multiuser use, you must temporarily move it prior to starting the tapeless procedure.

```
server# mv base_directory/cadds base_directory/lcadds
```

2. You must have a tape that has been authorized for at least two systems.
3. Load CADDs on your server via Part 3 of Appendix D.
4. Move your ../cadds directory into a unique name.

```
server# mkdir base_directory/tapeless1
server# mv base_directory/cadds base_directory/tapeless1
```

The tapeless number or system name should be changed for each tapeless workstation you install.

If you have one security tape, you can copy your `tapeless1` to `tapeless#` (whatever number you decide):

```
server# cp -r base_directory/tapeless1 base_directory/tapeless2
```

If you have several security tapes, repeat the above process for each workstation.

### CADDStation Steps

The following steps should be done on your tapeless workstation:

5. Mount `base_directory/tapeless1` on the server to `/usr/apl/cadds` on your tapeless workstation.

```
ws# mkdir /usr/apl /usr/apl/cadds
ws# vi /etc/fstab
```

add:

```
server:base_directory/tapeless1 /usr/apl/cadds nfs rw,hard 0 0
```

```
ws# mount -a
```

6. Create a CADDs user in the usual method.
7. Activate CADDs on your tapeless workstation.

```
ws# login cadds
```

## CADDStation Steps (cont)

8. If you moved your original cadds to lcadds on your server, move it back:

```
server# mv base_directory/lcadds base_directory/cadds
```

Tapeless installation is now complete.

## Other Security Issues

In this subsection, you will find material that explains how to use and enhance the functionality of your CADDMenus, what to do with faulty tapes, plus other information concerning the security log file, icon information file, system clocks, and error messages.

## Using and Enhancing CADDMenus

CADDMenus are compiled in the current version of CADDs, thus speeding startup and processing times. This enhancement, however, requires that all CADDMenus be recompiled on the server or CADDStation host processor on which the CADDMenus will run. Use the command `dmenu_compile`, described in the following procedure:

- |                                                  |                                                                                                                                                                                     |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <code>mname# suntools</code>                  | Opens a SUNtools window.                                                                                                                                                            |
| 2. <code>mname# cd /usr/apl/cadds/scripts</code> | Moves to the <code>scripts</code> directory to access <code>dmenu_compile</code> . Be sure that you have write access to this directory or there can be no output from compilation. |
| 3. <code>mname# dmenu_compile -help</code>       | Displays an explanation of the command                                                                                                                                              |
| 4. <code>mname# dmenu_compile -f</code>          | Followed by a file name, compiles that CADDMenu, or use...                                                                                                                          |
| <code>dmenu_compile -f</code>                    | Followed by a list of file names, compiles several CADDMenus, or use...                                                                                                             |
| <code>dmenu_compile -d</code>                    | Followed by a directory, compiles that directory.                                                                                                                                   |

### Note

- A compiled CADDMenu averages 1.5MB.
- CADDMenus cannot be compiled remotely.
- CADDMenus have associated `.o` files, indicating that the `.o` files are compiled files. If those files are removed from your system, the CADDMenus will work in interpreted mode, as in Release 1.10.
- Any properly prepared CADDMenu can be compiled using `dmenu_compile`.

## Replacement Tapes

Customers asking for replacement tapes due to a faulty tape must return the original tape before a replacement is shipped.

## Security Log File

getappl generates a security log file when an application is installed from a Computervision-secured tape. This file is called `asl<nnnn>` in the installation directory (where `<nnnn>` is the application model number) and exists as a text file. The security log file is write-executable by each user but is not intended to be modified by any user. If the security log file is modified or is absent, a security violation occurs. The result of a security violation is application-dependent.

## Icon Information File

The icon information file is a text file containing a list of the applications currently authorized to run on a particular workstation. An entry is added to this file each time an application is installed or authorized. As system manager, you are responsible for updating the file if an application is deleted. The reference file resides in the `/usr/lib/ufi/data/apl` directory in the `hostid.systemname` file.

The application information getappl provides is *application model number, path to application when initially installed on system, application expiration date, revision type, version number, and software release type*. For example:

```
filename: 11000060.system1
90021 /usr/bin/cadds/MCAE 861225 rev3.0a verH+ initial 7
/usr/lib/plotters/calcomp 860225 rev3.1a verI update : :
```

## System Clocks of a Multiuser System

If there is more than a day's difference in the system clocks on a multiuser system, the file `/usr/apl/cadds/bin/asl0001` must be edited once all workstations are enabled and whenever a workstation cannot enter CADDs. Changing all workstation dates to the current day ensures that all currently active workstations can use CADDs if authorized.

## Error Messages Associated with Loading Applications

```
getappl: unable to open <type_device>
getappl: unable to attach to <hostname>
getappl: bad tape format, call Field Service
getappl: program aborted, application(s) not installed
getappl: program aborted, <n> application(s) installed
getappl: The tape in use is not a Computervision distribution tape, call
 Field Service.
getappl: Out of memory
getappl: load permission denied for this system
```

You have attempted to load a tape already used on its maximum number of systems. You must use another tape that still has authorizations available.

## Error Messages Associated with Loading Applications (cont)

getappl: error detected and corrected, program continues  
    Don't do anything. The system is correcting itself.

getappl: error detected, correction in progress...  
    Don't do anything. The system is correcting itself.

getappl: error correction failed  
getappl: Error corrected, program continues. getappl: Future tape usage  
    should not have any errors.  
    Don't do anything. The system is correcting itself.

getappl: insufficient disk space to load application.  
getappl: cannot create file <file>  
getappl: cannot open file <file>  
getappl: cannot read file <file>

getappl: cannot change directory to <directory>  
getappl: cannot change directory back <directory>  
getappl: cannot change mode on file <file>  
getappl: application load is incomplete please consult with Computervision  
    Field Service

## Reference of Getappl Menu Options

In this subsection, you will find reference material that explains getappl menu options. The getappl command reference follows.

### Menu Options for the 1/2-inch Tape

A 1/2-inch tape can contain multiple applications, and each application can be authorized for multiple workstations. The list of automatically displayed applications is explained below.

#### Menu of Options:

- l) list application(s) on tape
- a) add application(s) to installation list
- d) delete application(s) from installation list
- i) install selected application(s) from tape
- m) menu--display this menu
- q) quit without change

#### l) list application(s) on tape

This option displays

1. The application number
2. Its price list number
3. The number of authorized systems the application can be installed on
4. The number of systems the application is already installed on
5. An X indicating which application is selected for installation

## Menu Options for the 1/2-inch Tape (cont)

Two applications are shown per line, as in this example:

| appl        | price list | systems | systems |   | appl        | price list | systems | systems |
|-------------|------------|---------|---------|---|-------------|------------|---------|---------|
| num. number |            | auth'd  | inst'd  |   | num. number |            | auth'd  | inst'd  |
| 1)          | 9001       | 3       | 0       | X | 2)          | 9002       | 3       | 0       |

The price list number of application 1 is 9001. It is authorized to be installed on three systems; it has been installed on zero systems already and is selected to be installed on the current system. Application 2, price list number 9002, can be installed on three systems but is not installed on any. Application 2 is not selected to be installed on the current system.

### Note

You must add applications to the installation list before any application can be installed.

#### a) add application(s) to installation list

Use to select applications to be installed. The system asks for a list of applications to add to the installation list. Specify by

1. A single application number
  2. A range of application numbers
  3. A combination of both separated by a space or a comma (e.g., 1 2,3 7-10,11,13-15)
- Selected applications are marked with an X when you enter the l option.

#### d) delete application(s) from installation list

Use to undo a selection of an application about to be installed.

#### i) install selected application(s) from tape

After completing the selection process, enter the i option to start the actual installation process. All selected applications from the installation list are installed on the current system. Should the installation fail, after resolving the problem, you must reinstall selected applications onto the same system. Select the interactive mode (-i option) to display a sub-menu for every application; otherwise, all selected applications are installed automatically.

#### m) menu--display this menu

Displays a menu with all available options.

#### q) quit

Exits the program.



### Authorize Option

Enter submenu option:a

Entered to authorize an application already loaded on disk. The following response occurs if the current working directory is not the recommended loading directory or if the application is not found in the current working directory:

Is application 9001 on recommended directory /usr/apl?

Enter FULL PATHNAME of alternative path: *The pathname to your selected directory.*

Authorizing application 9001 ...

If the software does not exist on the path specified, the system responds:

Application does not exist in *path\_name*.

Please install this application using menu option "x."

### Next Option

Enter submenu option:n

Entered to advance to the next application on the tape to be loaded/authorized. System displays the status of the next application and the menu of options:

Status of application on tape

-----  
Application : model number  
Recommended loading path : /usr  
Expiration date : NONE  
Initial/Update release : release type  
Rev. 1.1, Ver. number  
Application capable of running on 1 system(s)

Submenu of Options:

-----  
s) status of application  
h) hosts, list systems capable of running application  
x) extract application from tape  
a) authorize application on disk  
n) next application to be installed/authorized  
m) menu--display this menu  
q) quit

### Menu Option

Enter submenu option:m

Entered to display menu options again.

Submenu of Options:

-----  
s) status of application  
h) hosts, list systems capable of running application  
x) extract application from tape  
a) authorize application on disk  
n) next application to be installed/authorized  
m) menu--display this menu  
q) quit



## Quit Option

Enter submenu option:q

Entered to exit **getappl** command and to return to the UNIX prompt.

Rewinding tape...

#

## Get Application Command Reference

### getappl(1)

#### Description

The **get** application command extracts security protected applications from the distribution tape and places them onto the disk. The applications on the tape are processed sequentially.

#### Syntax

`/usr/cvbin/getappl [-i] [host:] tape_device`

#### Options

- i** Allows you to (1) specify the directory where you want the application to be installed and to (2) query the status of each application, with or without actually installing it. If you do not specify the **-i** option, applications on the tape are installed on the system into a default directory.
- host** Specifies remote system the *tape\_device* exists on; if you are using a local tape drive, host name is not necessary.
- tape\_device** Tape drive where application tape is mounted. Only raw device can be used (i.e., `/dev/rst0` for 1/4-inch tape; `/dev/rmt0` for 1/2-inch tape).

#### Note

Tape errors may occur the first time you install a 1/4-inch tape. The system will try to recover from them. After the first installation, tape errors should not happen.

## Software Installation Verification

Software Installation Verification (SIV) provides a means to verify, by Price List model number and name, what was installed on your CADDStations and CADDServers.

SIV produces a report listing your application by model number and application name. Compare this report against your Packing List or Schedule for Computervision Products to verify that all of your ordered software was successfully installed.

## Implementation

SIV is shipped to every customer and is used anytime new software or software updates are loaded. If, upon verification, you find that software is missing, the missing model numbers should be reported—as missing or damaged—to the Computervision Response Center or local Order Administration group. However, please note that Back Ordered software is called out on the Packing List; do not report this software as missing. All Back Ordered software will be shipped to you when available.

## Loading and Initialization

The SIV program resides on a separate tape labeled S.I.V. To load this tape, type one of the following commands:

|                                    |                          |
|------------------------------------|--------------------------|
| <code>ws# tar xvf /dev/rst0</code> | If loading a CADDStation |
| <code>ws# tar xvf /dev/rmt0</code> | If loading a CADDServer  |

SIV is run after all the applications have been installed. In the case of CADDs, it should be run after CADDs is assembled and loaded.

The program may be initialized to produce three (3) types of reports:

Screen Display (only)—type in:

```
ws or server# usr/cvcv/siv
```

Hard Copy Printout—type in:

```
ws or server# usr/cvcv/siv | lpr
```

Text file (file name is *output*)—type in:

```
ws or server# usr/cvcv/siv > output
```

## Dialog

Upon initialization, you will see the following message on your screen:

```
SOFTWARE INSTALLATION VERIFICATION PROGRAM REV 1.0

WELCOME TO COMPUTERVISION'S SOFTWARE INSTALLATION VERIFICATION PROGRAM
FOR SYSTEM 'hostname'.

THIS PROGRAM WILL LIST THE SOFTWARE FEATURES THAT HAVE BEEN INSTALLED
ON YOUR CADDSTATION. THE PROGRAM LISTING SHOULD BE COMPARED WITH YOUR
PACKING SLIP/CONFIGURATION LIST TO VERIFY IF FILES ARE MISSING FROM
YOUR SOFTWARE SHIPMENT.

THE PROGRAM CAN BE TERMINATED BY TYPING <CTRL-C>

THE FOLLOWING APPLICATIONS ARE INSTALLED ON YOUR SYSTEM
```

The report lists installed software by model number and description.

```
1001 CADD5 Graphics Software
.
.
.
3560 CVPN-A Automatic Part Nesting
```

## Reference

### Error Message

NO CV APPLICATIONS HAVE BEEN INSTALLED

If the above message appears, follow the procedures displayed immediately after the message to correct the problem.

### Files Used

**/usr/cvcv/optionlog**

Text file cross-reference of price list model number and description. This file is updated to reflect changes to the Price List.

**/usr/cvcv/siv**

UNIX shell script to verify what software has been installed.

# REFERENCE

## Installing System Software and CADDSS

# E

This appendix assumes prior knowledge of system software loading. It gives abbreviated directions how to perform the various steps of loading software, first on a CADDStation (referred to as "workstation"), then on a CADDServer system (referred to as "server").

- Workstation configurations are divided into two basic procedures that involve loading software and CADDSS on: (1) a dual disk workstation and (2) a single disk tapeless workstation.
- Server configurations are divided into four basic procedures: three that deal with multiuser server systems and one that applies to setting up the server as a stand-alone system (for separate CADDSS part storage). A "Mixed Configuration Table" presents a matrix of variable procedures for loading system software and CADDSS on systems with assorted workstation types.

In brief, the procedures include many of the same steps:

1. Running diag
2. Using setup
3. Preparing to load CADDSS (dividing the 2nd disk)
4. Loading CADDSS

### Note

This appendix abbreviates the basic steps of system software loading shown in Sections 2, 3, and 5 of this book. Although it assumes you will refer to the appropriate sections for details, it is a helpful tool for (1) obtaining an overview of the entire installation and configuration scenario, and (2) gathering concise information about the rather complicated task of partitioning a server disk.

## E.1 Installing Software and CADDs on Workstations

The following loading procedures are for loading system software and CADDs on (1) a dual disk workstation, and (2) on a single disk tapeless workstation.

---

### INSTALLING SOFTWARE AND CADDs ON A DUAL DISK WORKSTATION

---

#### Step 1: diag

L1-A *—or—* /etc/halt  
> b st()

Stop the system (/etc/halt is preferable).  
Enter tape type and parentheses (no spaces).  
Everything within shaded lines is not required if  
disks have been previously (and correctly) labeled.

---

Boot: st(0,0,3)

Specify controller: 1  
Specify controller address: RETURN  
Which target <CR=0>? RETURN  
Which unit/disk <CR=0>? RETURN  
Specify drive: RETURN or [1-9]

Specify 4 for Type E, or 8 for Type I.

Does this system have only one drive? Enter n for dual disk; y for single disk.  
Specify system use: 1

This dialog occurs if you entered 1 (CADDs):

Root size? <CR=8789K>? RETURN  
swap size? <CR=29296K>? 43008

Enter 43008 (for Mono or Color).

Is this correct? (Y/N<CR>) y  
Do you wish to modify this table? n  
diag> label

(Numbers vary and are calculated by system.)

Are you sure? y  
diag> d

Enter for 2nd disk only (Unit 1).

Do you want to change the unit number

only (y/n<cr>) y *—or—* n  
Answer n only if 2nd drive = different type (i.e.,  
one Type E, one Type I); then repeat steps above,  
*except* enter 1 for "Which unit/disk" and  
specify 2nd drive type (C-I).

Do you wish to modify this table? n  
diag> verify

Display label already on disk.

diag> label  
Are you sure? y  
diag> q

Quit diag.

---

Boot: st(0,0,4)

Enter st and (0,0,4).

From: st(0,0,5)

Enter as shown.

To: sd(0,0,1)

Copying in root takes about 9 minutes.

Boot: sd(0,0,1)vmunix -as

root device? sd0\*

Enter sd0\* (asterisk necessary).

WARNING: clock [gained/lost] XXXX days—CHECK AND RESET THE DATE!

# date yymmddhhmm.ss

#

Go to Step 2: setup.

#### Step 2: setup

# setup  
>>1  
>>1

Enter setup command.  
Install major Computervision UNIX release.  
Enter to use bit mapped display device (i.e., icons  
and mouse). You edit only Workstation Form.

## Step 2: setup (cont)

---

### WORKSTATION FORM:

Workstation Name: **springsteen**                      Ethernet Interface: **Sun Intel (ie0)**  
Workstation Type: **Standalone**                      Host Number: **5**  
/usr disk location: **second disk**  
System UNIX Type: **Minimum Network UNIX**  
Tape Device: **1/4" SCSI (st0)**                      Yellow Pages Type: **None**  
Tape Location: **Local**                                  Relabel disk: **No**

---

DISKS FORM (NA—No need to edit disk partitions)

---

CLIENTS FORM (NA—No clients with workstation)

---

SOFTWARE FORM (NA—Do not choose additional software with Minimum UNIX)

---

DEFAULTS FORM (NA—Defaults remain unchanged unless using an alternate Internet number)

---

After adding all information, select EXECUTE - SETUP. Enter yes at the prompt "Do you really want to Execute Setup?" You see these messages:

```
Beginning the installation
Please insert Minimum UNIX tape for system architecture
Making a file system for '/'
Making a file system for '/usr2'
Making a file system for '/usr'
Extracting the root files
Installation complete
```

EXIT or REBOOT via icons. (If you choose EXIT, abort (L1-A) to start reboot). Do the following:

```
> b Enter boot command.
root Login to root.
systemname# Workstation prompt appears (# used in examples).
cd /usr
rm -r tmp
mkdir /usr2/tmp
ln -s /usr2/tmp /usr
chmod 777 /usr2/tmp
```

## Step 3: Changing Network Information/Loading CADDs

These files need to be on each workstation and the server if you intend to use Ethernet and NFS:

1. Set up the /etc/hosts file. (Shown in detail in *Administering the Network.*)
2. Set up the /etc/hosts.equiv file. (Shown in detail in *Administering the Network.*)
3. Set up the /.rhosts file. (Shown in detail in *Administering the Network.*)

Load the CADDs tape according to the secured procedures noted in Appendix D.

```
cd /dev
MAKEDEV cvgpu0 This creates a device entry for GPU.
MAKEDEV cvtab0 This creates a device entry for tablet.
cd /
mkdir /usr2/cadds
cd /usr/apl/cadds/scripts/templates/cadds user
cp {login,.logout,.cshrc,.caddsrc,.suntools} /usr2/cadds
cd /usr2/cadds
mkdir parts
chmod 777 . .login .logout .suntools .cshrc .caddsrc *
chown cadds . .login .logout .suntools .cshrc .caddsrc * /usr2/cadds
/etc/halt Prepare for reboot.
> b Boot.
Systemname Login: cadds When cadds is typed at log-in prompt, user enters
 CADDs (takes about 5 minutes).
```

---

## INSTALLING SOFTWARE AND CADDs ON A 68020 TAPELESS WORKSTATION

---

This subsection defines loading procedures for a 68020 workstation with single 85MB Disk, with or without GPU, and with no tape drive. This procedure assumes a 68020 server has already been configured as an ND server, using one of the appropriate server procedures that follow. Procedure D is the standard server procedure for use with tapeless workstations.

---

### Step 1: Information Consolidation

Before starting this procedure, gather the following information:

- Names of server and all tapeless workstations
- Hardware Ethernet number of server
- Hardware Ethernet number of all tapeless workstations
- Internet number of server
- Internet number of all tapeless workstations
- 8-digit hexadecimal version of all Internet numbers

The procedure for the hexadecimal conversion of the Internet numbers and the method of obtaining the hardware Ethernet numbers is explained in Appendix B.

Use `adb(1)` to convert the Internet address to hexadecimal. For example, if Internet address is 192.9.200.100:

```
% adb
0t192=X c0
 c0
0t9=X 09
 09
0t200=X c8
 c8
0t100=X 64
 64
^D
%
```

Therefore, the file name for Internet address 192.9.200.100 is C009C864 (Note capitals).

The following chart is provided to help you consolidate all the required information.

|         | NAME  | H/W ETH #    | INTERNET #  | HEX INTERNET # |
|---------|-------|--------------|-------------|----------------|
| EXAMPLE | AZTEC | 8:0:1:0:2:d6 | 192.9.200.4 | C009C804       |
| SERVER  |       |              |             |                |
| W/S 1   |       |              |             |                |
| W/S 2   |       |              |             |                |
| W/S 3   |       |              |             |                |
| W/S 4   |       |              |             |                |
| W/S 5   |       |              |             |                |
| W/S 6   |       |              |             |                |

## Step 2: Server Configuration

```
vi /etc/hosts Add all tapeless workstation entries.
vi etc/hosts.equiv Add all tapeless workstation entries.
vi /.rhosts Add all tapeless workstation entries.
vi /etc/ethers Add all tapeless workstation entries.
/usr/etc/rarpd ie0 servername Add all tapeless workstation entries.
cd /tftpboot Add all tapeless workstation entries.
```

```
#ln -s ndboot.sun3.pub1 C009C804 Hex Internet # of workstations. Note: Make this
 link for each tapeless workstation using workstation's
 own hexadecimal Internet number.
```

Now load and mount the first UNIX distribution tape.

```
mt -f /dev/nrmt0 rew
mt -f /dev/nrmt0 fsf 5
dd if=/dev/nrmt0 of=/pub/minifs bs=20b
sync
mkdir /usr/server
```

## Step 3: diag on the Workstation

NOTE: You must do Steps 3-5 for each tapeless workstation.

```
L1-A -or- /etc/halt Stop the system (/etc/halt is preferable).
> Everything within shaded lines is not required if
 disks have been previously (and correctly) labeled.
```

---

```
> b ie(0,1,1)stand/diag
Specify controller: 1
Specify controller address: RETURN
Which target? RETURN
Which unit/disk? RETURN
Specify drive: [1-9] 4 & 8 = 85MB disk.
Does system have only one drive? y -or- n (n for Dual Drive System)
Specify system use: 1
root size: RETURN
swap size: 43008
Is this correct? y 2nd disk information is displayed.
Do you wish to modify this table? n
Is the above information correct? y
diag> label
Are you sure: y Label is shown.
diag>q Note: If dual disk system, label 2nd drive.
```

---

```
> b ie(0,1,1)stand/copy
From: ie(0,1,1)minifs
To: sd(0,0,1)
>b ie(0,1,1)boot -a
Boot: sd(0,0,1)vmunix -as
root device? sd0*
#
```

## Step 4: setup

```
setup Enter setup program. You edit only Workstation
 >>1 Form.
 >>1
```



## Step 4: setup (cont)

---

### WORKSTATION FORM:

Workstation Name: *workstation1*                      Ethernet Interface: *ie0*  
Workstation Type: *standalone*                      Host Number: *2*  
/usr disk location: *first disk*                      (2nd disk if dual disk system)  
System UNIX Type: *Minimum Network UNIX*  
Tape Device: *1/2" CPC (mt0)*                      Yellow Pages Type: *None*  
Tape Location: *Remote*  
Servername: *servername*                              Relabel disk: *No*  
Internet #: *192.9.200.1*

---

DISKS FORM (NA—No need to edit disk partitions)

---

CLIENTS FORM (NA—No clients with stand-alone workstation)

---

SOFTWARE FORM (NA—Do not choose additional software with Minimum UNIX)

---

DEFAULTS FORM (NA—Defaults remain unchanged unless using alternate Internet number)

---

After adding all information, select EXECUTE - SETUP. Enter yes at the prompt "Do you really want to Execute Setup?" You see these messages:

```
Beginning the installation
Please insert Minimum UNIX tape for system architecture
Making a file system for '/'
Making a file system for '/usr'
.
.
Installation complete
```

After loading all tapes, exit or reboot via icons. (If you choose Exit, abort (L1-A) to start reboot. Now, do the following:

```
> b Enter boot command.
login: root Login to root.
systemname# Prompt with workstation name will appear (# used
 in examples).
```

Now do the following for each tapeless workstation:

- Edit */etc/hosts* */etc/hosts.equiv* and */.rhosts* to proper configuration.
- MAKEDEV on any workstation specific devices (i.e., *cvtab0*, *cvgpu0*).

## Step 5: Setting up the Workstation to see CADDs on the Server

Do the following for each tapeless workstation:

```
mkdir /usr/servername /usr2
mkdir /usr2/cadds
mkdir
vi /etc/fstab Edit these two lines into fstab:
```

```
servername:/usr.MC68020/servername /usr/servername nfs rw,hard 0 0
servername:/usr2/cadds /usr2/cadds nfs rw,hard 0 0
```

## Step 5: Setting up the Workstation to see CADDs on the Server (cont)

```
mount -a
ln -s /usr/servername/apl /usr/apl
vipw
```

Add /usr2/cadd to etc/passwd file, if it does not already exist.

Reboot the workstation and log in as cadd.

Note: After all tapeless workstations are complete, you may want to remove minifs from the server.

---

## INSTALLING SOFTWARE AND CADDs ON A 68020 TAPELESS WORKSTATION FROM A STAND-ALONE SERVER

---

### Step 1: Information Consolidation

Before starting this procedure, gather the following information:

- Names of server and all tapeless workstations
- Hardware Ethernet number of server
- Hardware Ethernet number of all tapeless workstations
- Internet number of server
- Internet number of all tapeless workstations
- 8-digit hexadecimal version of all Internet numbers

The procedure for the hexadecimal conversion of the Internet numbers and the method of obtaining the hardware Ethernet numbers is outlined in Appendix B. The following chart is provided to help you consolidate all the required information.

|         | NAME  | H/W ETH #    | INTERNET #  | HEX INTERNET # |
|---------|-------|--------------|-------------|----------------|
| EXAMPLE | AZTEC | 8:0:1:0:2:d6 | 192.9.200.4 | C009C804       |
| SERVER  |       |              |             |                |
| W/S 1   |       |              |             |                |
| W/S 2   |       |              |             |                |
| W/S 3   |       |              |             |                |
| W/S 4   |       |              |             |                |
| W/S 5   |       |              |             |                |
| W/S 6   |       |              |             |                |

### Step 2: Server Configuration

PHASE 1: STARTING NETWORK DISKING

```
vi /etc/nd.local
```

Edit these two lines to the end of nd.local

```
user 0 0 /dev/xy0g 0 -1 -1
son
```

```
cd /dev
MAKEDEV nd10
/etc/nd - < /etc/nd.local
```

## PHASE 2: CHANGING /usr INTO A PUBLIC PARTITION

```
mkdir /usr/stand
cp /stand/* /usr/stand
ln -s /usr /pub
cp /boot /pub/boot
cd /usr/mdec
installboot bootnd /dev/xy0g
sync
```

## PHASE 3: MAKING ETHERNET ADDRESS AVAILABLE TO THE NETWORK

```
vi /etc/hosts Add all tapeless workstation entries.
vi etc/hosts.equiv Add all tapeless workstation entries.
vi /.rhosts Add all tapeless workstation entries.
vi /etc/ethers Add all tapeless workstation entries.
/usr/etc/rarpd ie0 servername Add all tapeless workstation entries.
cd /tftpboot Add all tapeless workstation entries.
ln -s ndboot.sun3.pub0 C009C804 Hex Internet number of workstations. Note: make this
 link for each tapeless workstation using
 workstation's own hexadecimal Internet number.
```

## PHASE 4: LOADING MINIFS

Now load and mount the first UNIX distribution tape.

```
mt -f /dev/nrmt0 rew
mt -f /dev/nrmt0 fsf 5
dd if=/dev/nrmt0 of=/pub/minifs bs=20b
sync
mkdir /usr/server
```

## Step 3: diag on the Workstation

Note: You must do Steps 3-5 for each tapeless workstation.

```
L1-A -or- /etc/halt Stop the system (/etc/halt is preferable).
> Everything within shaded lines is not required if
 disks have been previously (and correctly) labeled.
```

---

```
> b ie(0,1,1)stand/diag
Specify controller: 1
Specify controller address: RETURN
Which target? RETURN
Which unit/disk? RETURN
Specify drive: [1-9] 4 & 8 = 85MB disk.
Does system have only one drive? y -or- n
Specify system use: 1
root size: RETURN
swap size: 43008
Is this correct? y 2nd disk information is displayed.
Do you wish to modify this table? n
Is the above information correct? y
diag> label
Are you sure: y Label is shown.
diag>q If dual disk system, label 2nd drive.
```

---

```
> b ie(0,1,1)stand/copy
From: ie(0,1,1)minifs
To: sd(0,0,1)
>b ie(0,1,1)boot -a
Boot: sd(0,0,1)vmunix -as
root device? sd0*
#
```

## Step 4: setup

```
setup
>>1
>>1
```

Enter setup program. You edit only Workstation Form.

---

### WORKSTATION FORM:

|                                               |                                |
|-----------------------------------------------|--------------------------------|
| Workstation Name: <i>workstation1</i>         | Ethernet Interface: <i>ie0</i> |
| Workstation Type: <i>standalone</i>           | Host Number: <i>2</i>          |
| <i>/usr</i> disk location: <i>first disk</i>  | (2nd disk if dual disk system) |
| System UNIX Type: <i>Minimum Network UNIX</i> |                                |
| Tape Device: <i>1/2" CPC (mt0)</i>            | Yellow Pages Type: <i>None</i> |
| Tape Location: <i>Remote</i>                  |                                |
| Servename: <i>servername</i>                  | Relabel disk: <i>No</i>        |
| Internet #: <i>192.9.200.1</i>                |                                |

---

DISKS FORM (NA—No need to edit disk partitions)

---

CLIENTS FORM (NA—No clients with stand-alone workstation)

---

SOFTWARE FORM (NA—Do not choose additional software with Minimum UNIX)

---

DEFAULTS FORM (NA—Defaults remain unchanged unless using alternate Internet number)

---

After adding all information, select EXECUTE-SETUP. Enter yes at the prompt "Do you really want to Execute Setup?" You see these messages:

```
Beginning the installation
Please insert Minimum UNIX tape for system architecture
Making a file system for '/'
Making a file system for '/usr'
.
.
.
Installation complete
```

After loading all tapes, exit or reboot via icons. (If you choose Exit, abort (L1-A) to start reboot. Now, do the following:

```
> b
login: root
systemname#
```

Enter boot command.  
Login to root.  
Prompt with workstation name will appear  
(# used in examples).

Now do the following for each tapeless workstation:

- Edit */etc/hosts* */etc/hosts.equiv* and */.rhosts* to proper configuration.
- MAKEDEV on any workstation specific devices (i.e., *cvtab0*, *cvgpu0*).

## Step 5: Setting up the Workstation to see CADDs on the Server

Do the following for each tapeless workstation:

```
mkdir /usr/apl
```

```
mkdir /usr/apl/cadd
```

```
mkdir /usr2
```

```
vi /etc/fstab
```

Edit these 2 lines into fstab:

```
servername:/usr/apl/cadd /usr/apl/cadd nfs rw,hard 0 0
```

```
servername:/usr2 /usr2 nfs rw,hard 0 0
```

```
mount -a
```

```
vipw
```

Add /usr2/cadd to etc/passwd file, if it does not already exist.

Reboot the workstation and log in as cadd.

Note: After all tapeless workstations are complete, you may want to remove minifs from the server.

## E.2 Installing Software and CADDs on Servers

The following subsections apply to both multiuser server systems and the way servers can be used as stand-alone systems. Steps for installing software and CADDs are divided into these four basic procedures:

- Procedure A: 68020 Server with 68010 Clients
- Procedure B: 68020 Server with 68020 Clients
- Procedure C: Stand-alone Servers
- Procedure D: Servers with Tapeless Workstations

### Note

Procedures A-D assume configurations of a single workstation type. For configurations that mix workstation types, consult Table E-1. This table consists of the workstation type mix, the basic procedure to use, and modifications required for that specific mix. To use this table:

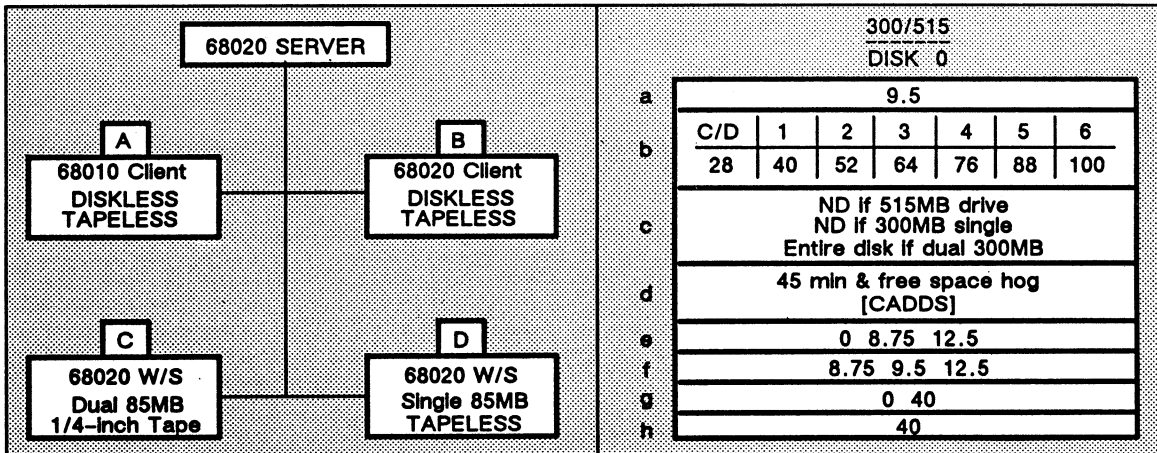
1. Determine your configuration mix.
2. Find that section of the table.
3. Note the basic procedure to be used and the modifications required.
4. Obtain that procedure.
5. Make the appropriate modifications.
6. Proceed with the installation.

Example for 68020 server with 68020 diskless client (Type B) and 68020 Dual 85MB workstation (Type C):

| BUILD WITH PROCEDURE |   | INCLUDE MODIFICATIONS FOR         |
|----------------------|---|-----------------------------------|
| B<br>C               | B | Procedure for Remote Part Storage |

After skimming through the subsections of E.2, power down all clients and begin steps outlined on the following pages.

Table E-1. Mixed Configuration Table



| ACTUAL CONFIGURATIONS | BUILD WITH PROCEDURE | INCLUDE MODIFICATIONS FOR                                                           |
|-----------------------|----------------------|-------------------------------------------------------------------------------------|
| A<br>B<br>C<br>D      | A<br>B<br>C<br>D     | NONE<br>NONE<br>NONE<br>NONE                                                        |
| A                     | A                    | 68020 clients insetup                                                               |
| B                     | A                    |                                                                                     |
| A                     | A                    | Procedure for Remote Part Storage                                                   |
| C                     |                      |                                                                                     |
| A                     | A                    | Disk 0 Partition e: 12.5<br>Partition f: 12.5<br>Procedure for Tapeless Workstation |
| D                     |                      |                                                                                     |
| B                     | B                    |                                                                                     |
| C                     |                      | Procedure for Remote Part Storage                                                   |
| A                     | A                    |                                                                                     |
| D                     |                      | Disk 0 Partition f: 12.5<br>Procedure for Tapeless Workstation                      |
| D                     | D                    |                                                                                     |
| C                     |                      | Procedure for Remote Part Storage                                                   |
| A                     | A                    |                                                                                     |
| B                     |                      | 68020 clients insetup                                                               |
| C                     |                      | Procedure for Remote Part Storage                                                   |
| A                     | A                    |                                                                                     |
| B                     |                      | 68020 clients insetup                                                               |
| D                     |                      | Disk 0 Partition e: 12.5<br>Partition f: 12.5<br>Procedure for Tapeless Workstation |
| A                     | A                    |                                                                                     |
| D                     |                      | Disk 0 Partition e: 12.5<br>Partition f: 12.5<br>Procedure for Tapeless Workstation |
| C                     |                      | Procedure for Remote Part Storage                                                   |
| B                     | B                    |                                                                                     |
| D                     |                      | Disk 0 Partition f: 12.5<br>Procedure for Tapeless Workstation                      |
| C                     |                      | Procedure for Remote Part Storage                                                   |
| A                     | A                    |                                                                                     |
| B                     |                      | 68020 clients Insetup                                                               |
| D                     |                      | Disk 0 Partition e: 12.5<br>Partition f: 12.5<br>Procedure for Tapeless Workstation |
| C                     |                      | Procedure for Remote Part Storage                                                   |

---

## Procedure A: 68020 Servers with 68010/20 Clients

---

This subsection defines loading procedures for a 68020 server with 68010 and 68020 diskless clients.

---

### Step 1: diag

> b mt()

---

```
Boot: mt(,,3)
Specify controller: 0
Specify controller address: RETURN
Which unit/disk? RETURN or 1
Specify drive: 0 - 3
diag> part
Is this system a file server system? y
Specify system use: 1
Does system have only one drive? n
Is 2nd drive entirely for clients? y
Type of 2nd drive: 0 - 3
Is this information correct? y
root size: 9625
swap size: RETURN
home directory: RETURN
number of clients: RETURN
pub10 size: RETURN
pub20 size: RETURN
usr10 size: RETURN
usr20 size: RETURN
client swap size: RETURN
Is this correct? y
Do you wish to modify this table? n
Is the above information correct? y
diag> label
Are you sure: y
diag> diag -or- q
```

---

```
Boot: mt(,,4)
From: mt(,,5)
To: xy(,,1)
Boot: xy(,,1)vmunix -as
root device? xy0*
#
```

### Step 2: setup

```
setup
>>1
>>1
```

Note that this example is for a dual disk system. Although dialog for a single disk system is in a slightly different order, answers are the same.

Boot to tape after halting the system. Everything within shaded lines is not required if disks have been previously (and correctly) labeled.

---

If boot fails, repeat mt(,,3).

RETURN for 1st disk; enter 1 for 2nd disk.

A & B = 300MB; Z = 515MB disk.

Enter partition command.

Enter y if single disk system.

A & B = 300MB; Z = 515MB disk.

Only root needs to be exactly correct, others can be manipulated in setup.

2nd disk information is displayed.

Enter label command to label 1st disk.

Label is shown.

Repeat diag ONLY to label 2nd disk.

---

Copying in root takes about 7 minutes.

Go to Step 2: setup.

Enter setup program. You edit four forms: Workstation, Software, Disks, Clients. (No changes required to Defaults Form.)

## Step 2: setup (cont)

---

### WORKSTATION FORM:

Name: *servername* Name of server (used later in CADDs loading).  
Type: **file server** Host number: 1  
CPUs Served:  
✓ 68010 cpu  
✓ 68020 cpu  
Client UNIX: **Full UNIX**  
System UNIX: **Full UNIX**  
Tape: **1/2" cpc (mt0)**  
Location: **local** Relabel disks: **Yes.**

---

### OPTIONAL SOFTWARE FORM:

MC 68020 and 68010:  
Manuals **Optional**  
Profile libraries **Optional**  
Sunwindows programs **Required**

---

### DISK FORM:

When you get to the Disk Menu, you will need to answer these questions and add up the resulting figures—before editing the form:

Question 1: Will you be running local CADDs?

If you are: Your swap space will be 42MB  
If you are not: Your swap space will be 28MB

Question 2: Will you be supporting Multuser CADDs?

If so, multiply by 12  
the number of clients  
you will be supporting: 12 x \_\_\_\_\_ = \_\_\_\_\_

If not supporting Multiuser CADDs Enter \_\_\_\_\_ 0 \_\_\_\_\_

Add together the resulting figures from question one and two to get your total swap figure. Use this figure in your disk form.

The following is an example where the server is not running local CADDs:

drive 0: Partition b: 

|          |    |    |    |    |    |     |
|----------|----|----|----|----|----|-----|
| Clients: | 1  | 2  | 3  | 4  | 5  | 6   |
| Swap:    | 40 | 52 | 64 | 76 | 88 | 100 |

  
Partition c: make type nd.  
Partition d: make free space hog.  
Partition e: 8.75MB.  
Partition f: 8.75MB.  
Partition g: 40MB.  
Partition h: 40MB.

drive 1: (Change only if Disk 0 = 300MB) Partition d: make free space hog.  
Partition g: make type nd.

---



## Step 2: setup (cont)

---

### CLIENTS FORM:

Edit new card cl\_10:

Type: 68020 —or— 68010

Root:

Size: 6

Swap:

Size: 12 (Mono) —or— 16 (Color)

Make Default

close

Add clients:

name

Ethernet number

Enter 68010 or 68020 based on client architecture.

If drive 0 is 515MB: root = xy0c

If drive 0 is 300MB: root = xy1g

If drive 0 is 515MB: swap = xy0c

If drive 0 is 300MB: swap = xy1g.

Enter 12 for Mono; 16 for Color.

Edit any additional cards.

RETURN required after number. (Close.)

**IMPORTANT:** Recheck Disk Form partitioning list to ensure proper size of drive 0's Partitions g and h. Reset if necessary. If you receive a message "No space on xy0g", change Drive 0's Free Space Hog to g in Disk Form. After choosing software options, review Disk Form for correctness; modify if required.

---

DEFAULTS FORM: (No changes required unless using alternate Internet number.)

---

### EXECUTE SETUP:

Yes

68020 Tape 2: OK

68010 Tape 1: OK

Making Clients

68010 Tape 2: OK

Installation complete

Reboot YES

Go to Step 3 to prepare 2nd disk for CADDs.

---

## Step 3: Configuring /usr2

### SERVER PROCEDURES—SINGLE DISK CONFIGURATION

# In `-s /usr/servername /usr2`

Enter to configure your disk to see /usr2:

### SERVER PROCEDURES—DUAL DISK CONFIGURATION

The next steps show you how to configure your disk based on whether your 1st disk is 515MB or 300MB. The main difference is where you put /usr2:

- For 515MB disk 0 (1st disk), usr2 goes in partition xy1g.
- For 300MB disk 0 (1st disk), usr2 goes in partition xy1d.

FOR DUAL DRIVE CONFIGURATIONS IF DISK 0 IS 515MB:

# `mkdir /usr2`

Add /usr2 by doing the following:

# `vi /etc/fstab`

Edit this line into fstab:

`/dev/xy1g /usr2 4.2 rw 1 7`

# `vi /etc/exports`

Edit this line into /etc/exports:

`/usr2`

# `newfs /dev/rxy1g /usr2`

Enter ONLY if pack does not contain data.

# `mount -a`

FOR DUAL DRIVE CONFIGURATIONS IF DISK 0 IS 300MB:

# `mkdir /usr2`

Add /usr2 by doing the following:

# `vi /etc/fstab`

Edit this line into fstab:

`/dev/xy1d /usr2 4.2 rw 1 7`

# `vi /etc/exports`

Edit this line into /etc/exports:

`/usr2`

# `newfs /dev/rxy1d /usr2`

Enter ONLY if pack does not contain data.

# `mount -a`

## SERVER PROCEDURES—ALL CONFIGURATIONS

### REDIRECTING /TMP FILES:

```
mkdir /usr2/tmp Do these things to redirect tmp files:
chmod 777 /usr2/tmp
rm -r /usr.MC68020/tmp /usr.MC68010/tmp
rm -r /private.MC68020/usr/tmp /private.MC68010/usr/tmp
ln -s /usr2/tmp /usr.MC68020
ln -s /usr2/tmp /private.MC68020/usr
ln -s /usr2/tmp /usr.MC68010
ln -s /usr2/tmp /private.MC68010/usr
```

### ETHERNET CONFIGURATION:

1. Set up the /etc/hosts.equiv file. (Shown in detail in *Administering the Network*.)
2. Set up the /.rhosts file. (Shown in detail in *Administering the Network*.)
3. Reboot the server.
4. Reboot all clients.

## CLIENT PROCEDURES—SINGLE DISK CONFIGURATIONS

```
ln -s /usr/servername /usr2 Do this for each client.
```

## CLIENT PROCEDURES—DUAL DISK CONFIGURATIONS

The next steps must be done for each client.

```
mkdir /usr2 Add /usr2 by doing the following:
vi /etc/fstab Edit this line into fstab:
 servername:/usr2 /usr2 nfs rw,hard 0 0
mount -a
```

## CLIENT PROCEDURES—ALL CONFIGURATIONS

- Edit /etc/hosts.equiv and /.rhosts to proper configuration.
- MAKEDEV on any client specific devices (i.e., qfb, cvtab0).

## Step 4: Loading CADDStation Software

### PHASE 1: LOADING CADDs ON THE SERVER

```
mkdir /usr/apl If you get message "file exists", ignore and
cd /usr/servername proceed.
mkdir apl apl/cadds
ln -s /usr/servername/apl/cadds /usr.MC68020/apl
ln -s /usr/servername/apl/cadds /usr.MC68010/apl
cd /dev
MAKEDEV cvgpu0 This creates a device entry for GPU.
cd /
```

Now load CADDs according to the secured procedures noted in Appendix D.

### PHASE 2: CREATING A CADDs USER

The following things are required for each CADDs user:

- Each CADDs user must have an entry in the server and client password file.
- Each CADDs user must have a home directory under /usr2.
- Each CADDs user's home directory must contain these six files:  
.login .suntools parts  
.logout .caddsrc .cshrc
- After making all client CADDs directories and server /etc/passwd file, download the server /etc/passwd file to each client using rcp.

EXAMPLE:

```
mkdir /usr2/cadds Make a directory; create these required files:
cd /usr/apl/cadds/scripts/templates/cadds_user
cp {login,.logout,.cshrc,.caddsrc,.suntools} /usr2/cadds
cd /usr2/cadds
mkdir parts
chown cadds /usr2/cadds parts .login .logout .cshrc .suntools .caddsrc .
chmod 777 .login .logout .suntools .cshrc .caddsrc parts .
```

- Edit .caddsrc file to contain the line: setenv CADDSSHOST *servername*
- Reboot the server.
- Reboot all clients and log in as cadds.

---

## Procedure B: 68020 Server with 68020 Clients

---

This subsection defines loading procedures for a 68020 server with 68020 diskless clients.

---

### Step 1: diag

> b mt0

Note that example is for a dual disk system. Although dialog for a single disk system is in a slightly different order, answers are the same. Boot to tape after halting the system. Everything within shaded lines is not required if disks have been previously (and correctly) labeled.

---

|                                        |                                                                             |
|----------------------------------------|-----------------------------------------------------------------------------|
| Boot: mt(.,3)                          | If boot fails, repeat mt(.,3).                                              |
| Specify controller: 0                  |                                                                             |
| Specify controller address: RETURN     |                                                                             |
| Which unit/disk? RETURN or 1           | RETURN for 1st disk; enter 1 for 2nd disk.                                  |
| Specify drive: 0 - 3                   | A and B = 300MB; Z = 515MB disk.                                            |
| diag> part                             | Enter partition command.                                                    |
| Is this system a file server system? y |                                                                             |
| Specify system use: 1                  |                                                                             |
| Does system have only one drive? n     | Enter y if single disk system.                                              |
| Is 2nd drive entirely for clients? y   |                                                                             |
| Type of 2nd drive: 0 - 3               | A and B = 300MB; Z = 515MB disk.                                            |
| Is this information correct? y         |                                                                             |
| root size: 9625                        |                                                                             |
| swap size: RETURN                      |                                                                             |
| home directory: RETURN                 |                                                                             |
| number of clients: RETURN              |                                                                             |
| pub10 size: RETURN                     | Only root needs to be exactly correct, others will be manipulated in setup. |
| pub20 size: RETURN                     |                                                                             |
| usr10 size: RETURN                     |                                                                             |
| usr20 size: RETURN                     |                                                                             |
| client swap size: RETURN               |                                                                             |
| Is this correct? y                     | 2nd disk information is displayed.                                          |
| Do you wish to modify this table? n    |                                                                             |
| Is the above information correct? y    |                                                                             |
| diag> label                            | Enter label command to label 1st disk.                                      |
| Are you sure: y                        | Label is shown.                                                             |
| diag> diag -or- q                      | Repeat diag ONLY to label 2nd disk.                                         |

---

### Step 1: diag (cont)

```
Boot: mt(.,4)
From: mt(.,5)
To: xy(.,1)
Boot: xy(.,1)vmunix -as
root device? xy0*
#
```

Copying in root takes about 7 minutes.

Go to Step 2: setup.

### Step 2: setup

```
setup
>>1
>>1
```

Enter setup program. You edit four forms: Workstation, Software, Disks, Clients. (No changes required to Defaults Form.)

---

#### WORKSTATION FORM:

```
Name: servername Name of server (used later in CADDs loading).
Type: file server Host number: 1
CPUs Served:
 68010 cpu
 ✓ 68020 cpu
Client UNIX:
System UNIX: Full UNIX
Tape: 1/2" cpc (mt0)
Location: local Relabel disks: Yes.
```

---

#### OPTIONAL SOFTWARE FORM:

```
MC 68020:
Manuals Optional
Profile libraries Optional
Sunwindows programs Required
```

---

#### DISK FORM:

When you get to the Disk Menu, you will need to answer these questions and add up the resulting figures—before editing the form:

Question 1: Will you be running local CADDs?

If you are: Your swap space will be 42MB  
If you are not: Your swap space will be 28MB

Question 2: Will you be supporting Multiuser CADDs?

If so, multiply by 12  
the number of clients  
you will be supporting: 12 x \_\_\_\_\_ = \_\_\_\_\_

If not supporting Multiuser CADDs Enter \_\_\_\_\_0\_\_\_\_\_

Add together the resulting figures from question one and two to get your total swap figure. Use this figure in your disk form.

## Step 2: setup (cont)

The following is an example where the server is not running local CADDs:

|                                          |                                                                                                                                                                                                                                                                                                      |          |    |    |    |     |   |   |       |    |    |    |    |    |     |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|----|----|-----|---|---|-------|----|----|----|----|----|-----|
| drive 0:                                 | Partition b: <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>Clients:</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>Swap:</td> <td>40</td> <td>52</td> <td>64</td> <td>76</td> <td>88</td> <td>100</td> </tr> </table> | Clients: | 1  | 2  | 3  | 4   | 5 | 6 | Swap: | 40 | 52 | 64 | 76 | 88 | 100 |
| Clients:                                 | 1                                                                                                                                                                                                                                                                                                    | 2        | 3  | 4  | 5  | 6   |   |   |       |    |    |    |    |    |     |
| Swap:                                    | 40                                                                                                                                                                                                                                                                                                   | 52       | 64 | 76 | 88 | 100 |   |   |       |    |    |    |    |    |     |
|                                          | Partition c: make type nd.                                                                                                                                                                                                                                                                           |          |    |    |    |     |   |   |       |    |    |    |    |    |     |
|                                          | Partition d: make free space hog.                                                                                                                                                                                                                                                                    |          |    |    |    |     |   |   |       |    |    |    |    |    |     |
|                                          | Partition e: 0MB.                                                                                                                                                                                                                                                                                    |          |    |    |    |     |   |   |       |    |    |    |    |    |     |
|                                          | Partition f: 9.5MB.                                                                                                                                                                                                                                                                                  |          |    |    |    |     |   |   |       |    |    |    |    |    |     |
|                                          | Partition g: 0MB.                                                                                                                                                                                                                                                                                    |          |    |    |    |     |   |   |       |    |    |    |    |    |     |
|                                          | Partition h: 40MB.                                                                                                                                                                                                                                                                                   |          |    |    |    |     |   |   |       |    |    |    |    |    |     |
| drive 1: (Change only if Disk 0 = 300MB) | Partition d: make free space hog.<br>Partition g: make type nd.                                                                                                                                                                                                                                      |          |    |    |    |     |   |   |       |    |    |    |    |    |     |

---

### CLIENTS FORM:

Edit new card cl\_20:

Type: 68020

Root:

Size: 6

Swap:

size: 12 (Mono) —or— 16 (Color)

Make Default

close

Add clients:

name

Ethernet number

If drive 0 is 515MB: root = xy0c

If drive 0 is 300MB: root = xy1g

If drive 0 is 515MB: swap = xy0c

If drive 0 is 300MB: swap = xy1g.

Enter 12 for Mono; 16 for Color.

Edit any additional cards.

RETURN required after number. (Close.)

**IMPORTANT:** Recheck Disks Form partitioning to ensure proper size of drive 0's partitions g and h. Reset if necessary. If you receive a message "No space on xy0g", change Drive 0's Free Space Hog to g in Disk Form. After choosing software options, review Disk Form for correctness; modify if required.

---

DEFAULTS FORM: (No changes required unless using alternate Internet number.)

---

### EXECUTE SETUP:

Yes

Making Clients

68020 Tape 2: OK

Installation complete

Reboot YES

Go to Step 3 to prepare 2nd disk for CADDs.

---

## Step 3: Configuring /usr2

### SERVER PROCEDURES—SINGLE DISK CONFIGURATION

# ln -s /usr/servername /usr2 Enter to configure your disk to see /usr2:

### SERVER PROCEDURES—DUAL DISK CONFIGURATION

The next steps show you how to configure your disk based on whether your 1st disk is 515MB or 300MB. The main difference is where you put /usr2:

- For 515MB disk 0 (1st disk), usr2 goes in partition xy1g.
- For 300MB disk 0 (1st disk), usr2 goes in partition xy1d.

#### FOR DUAL DRIVE CONFIGURATIONS IF DISK 0 IS 515MB:

```
mkdir /usr2
vi /etc/fstab
vi /etc/exports
newfs /dev/rxy1g /usr2
mount -a
```

Add /usr2 by doing the following:  
Edit this line into fstab:  
/dev/xy1g /usr2 4.2 rw 1 7  
Edit this line into /etc/exports:  
/usr2  
Enter ONLY if pack does not contain data.

#### FOR DUAL DRIVE CONFIGURATIONS IF DISK 0 IS 300MB:

```
mkdir /usr2
vi /etc/fstab
vi /etc/exports
newfs /dev/rxy1d /usr2
mount -a
```

Add /usr2 by doing the following:  
Edit this line into fstab:  
/dev/xy1d /usr2 4.2 rw 1 7  
Edit this line into /etc/exports:  
/usr2  
Enter ONLY if pack does not contain data.

### SERVER PROCEDURES—ALL CONFIGURATIONS

#### REDIRECTING /TMP FILES:

```
mkdir /usr2/tmp
chmod 777 /usr2/tmp
rm -r /usr.MC68020/tmp
rm -r /private.MC68020/usr/tmp
ln -s /usr2/tmp /usr.MC68020
ln -s /usr2/tmp /private.MC68020/usr
```

Do these things to redirect tmp files:

#### ETHERNET CONFIGURATION:

1. Set up the /etc/hosts.equiv file. (Shown in detail in *Administering the Network*.)
2. Set up the /.rhosts file. (Shown in detail in *Administering the Network*.)
3. Reboot the server.
4. Reboot all clients.

### CLIENT PROCEDURES—SINGLE DISK CONFIGURATIONS

```
ln -s /usr/servername /usr2
```

Do this for each client.

### CLIENT PROCEDURES—DUAL DISK CONFIGURATIONS

The next steps must be done for each client.

```
mkdir /usr2
vi /etc/fstab
mount -a
```

Add /usr2 as follows:  
Edit this line into fstab:  
servername:/usr2 /usr2 nfs rw,hard 0 0

### CLIENT PROCEDURES—ALL CONFIGURATIONS

- Edit /etc/hosts.equiv and /.rhosts to proper configuration.
- MAKEDEV on any client specific devices (i.e., qfb, cvtab0).

## Step 4: Loading CADDStation Software

#### PHASE 1: LOADING CADDs ON THE SERVER

```
mkdir /usr/apl
cd /usr/servername
mkdir apl apl/cadds
ln -s /usr/servername/apl/cadds /usr.MC68020/apl
cd /dev
MAKEDEV cvgpu0
cd /
```

If you get message "file exists", ignore it and proceed.  
This creates a device entry for GPU.

## Step 4: Loading CADDStation Software

Now load CADDs according to the secured procedures noted in Appendix D.

### PHASE 2: CREATING A CADDs USER

The following things are required for each CADDs user:

- Each CADDs user must have an entry in the server and client password file.
- Each CADDs user must have a home directory under /usr2.
- Each CADDs user's home directory must contain these six files:  
.login .suntools parts  
.logout .caddsrc .cshrc
- After making all client CADDs directories and server /etc/passwd file, download the server /etc/passwd file to each client using rcp.

#### EXAMPLE:

```
mkdir /usr2/caddsrc Make a directory; create these required files:
cd /usr/apl/caddsrc/scripts/templates/caddsrc_user
cp {login,logout,.cshrc,.caddsrc,.suntools} /usr2/caddsrc
cd /usr2/caddsrc
mkdir parts
chown caddsrc /usr2/caddsrc parts .login .logout .cshrc .suntools .caddsrc :
chmod 777 .login .logout .suntools .cshrc .caddsrc parts .
```

- Edit .caddsrc file to contain the line: `setenv CADDSSHOST servername`
- Reboot the server.
- Reboot all clients and log in as caddsrc.

---

## Procedure C: Stand-alone Servers

---

This subsection defines loading procedures for a 68020 server with 68020 diskful workstations running Mini UNIX.

#### Note

Mini UNIX in a CADDServer environment is limited to one to three clients. For four to six clients you need to reconfigure your UNIX kernel. To do so, edit the /sys/conf/GENERIC file, changing the maxusers variable from 4 to 10. Then compile and relink the kernel. (See Section 4.)

---

### Step 1: diag

> b mt()

Boot to tape after halting the system. Everything within shaded lines is not required if disks have been previously (and correctly) labeled.

---

## Step 1: diag (cont)

```
Boot: mt(,,3)
Specify controller: 0
Specify controller address: RETURN
Which unit/disk? RETURN or 1
Specify drive: 0 - 3
diag> part
Is this system a file server system? y
Statement of use: 2
One Drive: y/n
Root Size: 9600
Swap size: RETURN
Is the above information correct? y
Do you wish to modify this table? n
diag> label
Are you sure: y
diag> diag -or- q
```

If boot fails, repeat mt(,,3).

RETURN for 1st disk; enter 1 for 2nd disk.  
A & B = 300MB; Z = 515MB disk.  
Enter partition command.

Enter label command to label 1st disk.  
Label is shown.  
Repeat diag ONLY to label 2nd disk.

---

```
Boot: mt(,,4)
From: mt(,,5)
To: xy(,,1)
Boot: xy(,,1)vmunix -as
root device? xy0*
#
```

Copying in root takes about 7 minutes.

Go to Step 2: setup.

## Step 2: setup

```
setup
>>1
>>1
```

Enter setup program. You edit two forms:  
Workstation and Software. (No changes  
required to Disk, Clients, and Defaults Form.)

---

### WORKSTATION FORM:

```
Name: servername Name of server (used later in CADDs loading).
Type: standalone Host number: 1
/usr File System: 1st Disk
System UNIX: Mini-Networked UNIX
Tape: 1/2" cpc (mt0)
Location: local Relabel disks: Yes
```

---

### SOFTWARE FORM (Do not choose additional software with Minimum UNIX)

#### DISK FORM:

When you get to the Disk Menu, you will need to answer these questions and add up the resulting figures—before editing the form:

Question 1: Will you be running local CADDs?

If you are: Your swap space will be 42MB  
If you are not: Your swap space will be 28MB

Question 2: Will you be supporting Multituser CADDs?

If so, multiply by 12  
the number of clients  
you will be supporting:

12 x \_\_\_\_\_ = \_\_\_\_\_

If not supporting Multiuser CADDs

Enter \_\_\_\_\_ 0 \_\_\_\_\_



## Step 2: setup (cont)

Add together the resulting figures from question one and two to get your total swap figure. Use this figure in your disk form.

---

CLIENTS FORM: (No client partitions required.)

---

DEFAULTS FORM: (No changes required unless using alternate Internet number.)

---

EXECUTE SETUP:

NOTE: With Mini UNIX you are not prompted for a second tape.

Installation complete

Reboot YES

---

## Step 3: Preparing to Load CADDs

FOR SINGLE DISK CONFIGURATIONS:

```
root
systemname#
ln -s /usr /usr2
```

Login to root.  
Workstation prompt appears (# used in examples).

FOR DUAL DISK SERVER CONFIGURATIONS:

```
mkdir /usr2
vi /etc/fstab

vi /etc/exports

newfs /dev/rxy1g /usr2
mount -a
```

Add /usr2 as follows:  
Edit this line into fstab:  
/dev/xy1g /usr2 4.2 rw 1 7  
Edit this line into /etc/exports:  
/usr2  
Enter ONLY if pack does not contain data.

WORKSTATION PROCEDURES:

If you have not loaded UNIX on your workstations, do so via the workstation instructions in E.1; then continue with step 4. If UNIX is already running on your workstations, continue with step 4.

## Step 4: Changing Network Information/Loading CADDs

These files need to be on each workstation and the server if you intend to use Ethernet and NFS:

1. Set up the /etc/hosts file. (Shown in detail in *Administering the Network*.)
2. Set up the /etc/hosts.equiv file. (Shown in detail in *Administering the Network*.)
3. Set up the /.rhosts file. (Shown in detail in *Administering the Network*.)
4. Reboot the server.

Load the CADDs tape according to security procedures noted in Appendix D.

```
cd /dev
MAKEDEV cvgpu0
MAKEDEV cvtab0
cd /
mkdir /usr2/cadd
cd /usr/apl/cadd/scripts/templates/cadduser
cp {login,.logout,.cshrc,.caddsrc,.suntools} /usr2/cadd
cd /usr2/cadd
mkdir parts
chmod 777 .login .logout .suntools .cshrc .caddsrc *
```

This creates a device entry for GPU.  
This creates a device entry for tablet.

## Step 4: Changing Network Information/Loading CADDs (cont)

```
chown cadds .login .logout .suntools .cshrc .caddsrc * /usr2/cadds
/etc/halt Prepare for reboot.
> b Boot.
Systemname Login: cadds When cadds is typed at log-in prompt, user enters
 CADDs. (Takes about 5 minutes.)
```

## Step 6: Parts Storage

These steps apply to both workstations and servers. Follow these steps based on either local or remote CADDs parts storage:

---

### A. LOCAL Parts Storage Procedure

(On 68020 Workstation)

```
mkdir /usr2/cadds/parts
chown cadds /usr2/cadds/parts
cd /usr2/cadds/parts
pwd
 /usr2/cadds/parts
```

---

### B. REMOTE Parts Storage Procedure

(On 68020 Workstation)

```
mkdir /remote
rm -r /usr2/cadds/parts
ln -s /remote/parts /usr2/cadds
mount systemname:/usr /remote
chown cadds /usr2/cadds/parts

Edit /etc/rc.local; add
 /etc/mount systemname:/usr /remote

cd /usr2/cadds/parts
pwd
 /remote/parts (for remote)
```

---

### C. LOCAL/REMOTE Parts Storage Procedure

(On 68020 Workstation)

```
mkdir /remote
mkdir /remote/parts
cd /usr2/cadds/parts
ln -s /remote/parts /usr2/cadds/parts/remote
mount systemname:/usr /remote

Edit /etc/rc.local file and add:
 /etc/mount systemname:/usr /remote
chown cadds /usr2/cadds/parts/remote
cd /usr2/cadds/parts/remote
pwd
 /remote/parts
cd /usr2/cadds/parts
pwd
 /usr2/cadds/parts
```

---

---

## Procedure D: Servers with Tapeless Workstations

---

This subsection defines loading procedures for a 68020 server with 68020 tapeless workstations.

---

### Step 1: diag

> b mt0

Note that example is for a dual disk system. Although dialog for a single disk system is in a slightly different order, answers are the same.

Boot to tape after halting the system. Everything within shaded lines is not required if disks have been previously (and correctly) labeled.

---

### Step 1: diag

Boot: mt(.,3)  
Specify controller: 0  
Specify controller address: RETURN  
Which unit/disk? RETURN or 1  
Specify drive: 0 - 3  
diag> part  
Is this system a file server system? y  
Specify system use: 1  
Does system have only one drive? n  
Is 2nd drive entirely for clients? y  
Type of 2nd drive: 0 - 3  
Is this information correct? y  
root size: 9625  
home directory: RETURN  
number of clients: RETURN  
pub10 size: RETURN  
pub20 size: RETURN  
usr10 size: RETURN  
usr20 size: RETURN  
client swap size: RETURN  
Is this correct? y  
Do you wish to modify this table? n  
Is the above information correct? y  
diag> label  
Are you sure: y  
diag> diag -or- q

If boot fails, repeat mt(.,3).

RETURN for 1st disk; enter 1 for 2nd disk.  
A & B = 300MB; Z = 515MB disk.  
Enter partition command.

Enter y if single disk system.

A & B = 300MB; Z = 515MB disk.

Only root needs to be exactly correct, others will be manipulated in setup.

2nd disk information is displayed.

Enter label command to label 1st disk.  
Label is shown.  
Repeat diag ONLY to label 2nd disk.

---

Boot: mt(.,4)  
From: mt(.,5)  
To: xy(.,1)  
Boot: xy(.,1)vmunix -as  
root device? xy0\*  
#

Copying in root takes about 7 minutes.

Go to Step 2: setup.

## Step 2: setup

```
setup
>>1
>>1
```

Enter setup program. You edit three forms: Workstation, Software, and Disks. (Clients form is not applicable; no changes required to Defaults Form.)

---

### WORKSTATION FORM:

Name: *servername* Name of server (used later in CADDs loading).  
 Type: **file server** Host number: 1  
 CPUs Served:  
   68010 cpu  
 68020 cpu  
 System UNIX: **Full UNIX**  
 Tape: 1/2" cpc (mt0)  
 Location: **local** Relabel disks: **Yes.**

---

### OPTIONAL SOFTWARE FORM:

MC 68020:  
 Manuals **Optional**  
 Profile libraries **Optional**  
 Sunwindows programs **Required**

---

### DISKS FORM: (

drive 0:

|          |    |    |    |    |    |     |
|----------|----|----|----|----|----|-----|
| Clients: | 1  | 2  | 3  | 4  | 5  | 6   |
| Swap:    | 40 | 52 | 64 | 76 | 88 | 100 |

Partition b:  
 Partition c: make type ND.  
 Partition d: make free space hog.  
 Partition e: 0MB.  
 Partition f: 12.5MB.  
 Partition g: 0MB.  
 Partition h: 40MB.  
 (No changes required for Drive 1)

---

CLIENTS FORM: (No client partitions required.)

---

DEFAULTS FORM: (No client partitions required unless using alternate Internet number.)

---

### EXECUTE SETUP:

Yes  
   68020 Tape 2: **OK**  
 Installation complete  
 Reboot **YES** Go to Step 3 to prepare to load CADDs.

## Step 3: Configuring /usr2

### SERVER PROCEDURES—SINGLE DISK CONFIGURATION

```
ln -s /usr/servername /usr2
```

Enter to configure your disk to see /usr2:

### SERVER PROCEDURES—DUAL DISK CONFIGURATION

```
mkdir /usr2
vi /etc/fstab
vi /etc/exports
newfs /dev/rxy1g /usr2
mount -a
```

Add /usr2 as follows:  
 Edit this line into **fstab**:  
 /dev/xylg /usr2 4.2 rw 1 7  
 Edit this line into **/etc/exports**: /usr2  
 Enter **ONLY** if pack does not contain data.

## SERVER PROCEDURES—ALL CONFIGURATIONS

### REDIRECTING /TMP FILES:

```
mkdir /usr2/tmp
chmod 777 /usr2/tmp
rm -r /usr.MC68020/tmp
rm -r /private.MC68020/usr/tmp
ln -s /usr2/tmp /usr.MC68020
ln -s /usr2/tmp /private.MC68020/usr
```

Do these things to redirect tmp files:

### ETHERNET CONFIGURATIONS:

1. Set up the `/etc/hosts.equiv` file. (Shown in detail in *Administering the Network*.)
2. Set up the `/.rhosts` file. (Shown in detail in *Administering the Network*.)
3. Reboot the server.

### CLIENT PROCEDURES

Now load UNIX on the tapeless workstations via instructions in Appendix B.

## Step 4: Loading CADDStation Software

### PHASE 1: LOADING CADDs ON THE SERVER

```
mkdir /usr/apl
cd /usr/servername
mkdir apl apl/cadds
ln -s /usr/servername/apl/cadds /usr.MC68020/apl
cd /dev
MAKEDEV cvgpu0
cd /
```

If you get file exists message, ignore and proceed.

This creates a device entry for GPU.

Now load CADDs on the server according to the secured procedures noted in Appendix D.

### PHASE 2: CREATING A CADDs USER

The following things are required for each CADDs user:

- Each CADDs user must have an entry in the server and client password file.
- Each CADDs user must have a home directory under `/usr2`; the home directory must contain these six files: `.login .suntools parts .logout .cshrc .caddsrc`
- After making all client CADDs directories and server `/etc/passwd` file, download the server `/etc/passwd` file to each client using `rcp`.

Example:

```
mkdir /usr2/cadds
cd /usr/apl/cadds/scripts/templates/cadds user
cp { .login, .logout, .cshrc, .caddsrc, .suntools } /usr2/cadds
cd /usr2/cadds
mkdir parts
chown cadds /usr2/cadds parts .login .logout .cshrc .suntools .caddsrc
chmod 777 .login .logout .suntools .cshrc .caddsrc parts
```

Make a directory; create these required files:

### PHASE 3: LOADING UNIX/SETTING UP THE WORKSTATION TO SEE CADDs ON THE SERVER

Now load UNIX on the workstations via workstation instructions in E.1. Then do the following on each tapeless workstation:

```
mkdir /usr/servername
vi /etc/fstab
servername:/usr.MC68020/servername /usr/servername nfs rw,hard 0 0
mount -a
ln -s /usr/servername/apl /usr
```

Edit this line into `fstab`:

#### PHASE 4: SETTING UP A CADDS USER & PART STORAGE FOR THE WORKSTATION

Do the following for each tapeless workstation:

```
mkdir /usr2
mkdir /usr2/cadds
vi /etc/fstab
```

Make a directory; create these required files:

```
mount -a
vipw
```

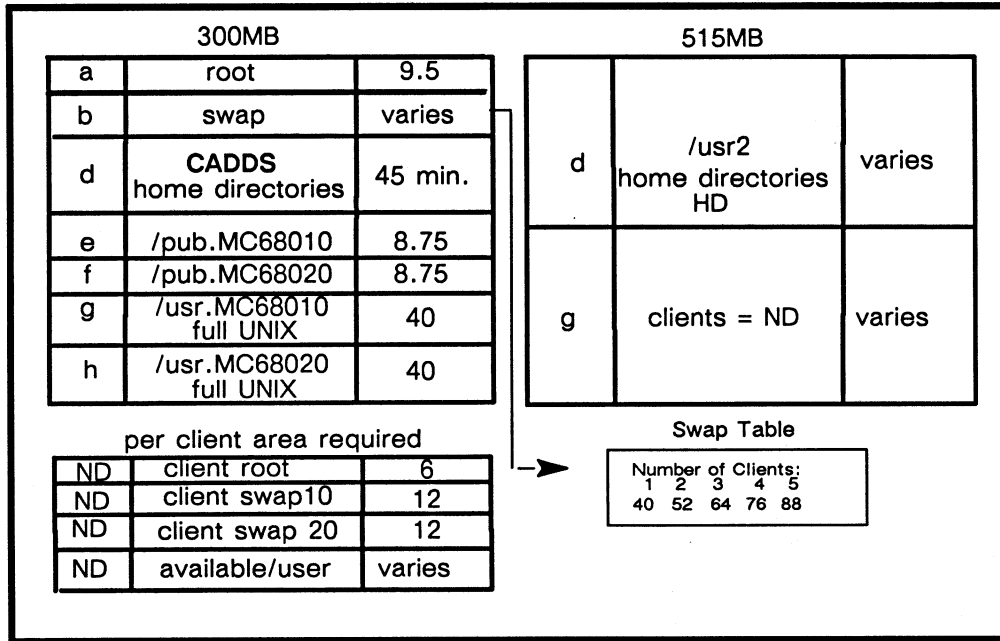
Edit this line into fstab:

```
servername:/usr2/cadds /usr2/cadds nfs rw,hard 0 0
```

Add /usr2/cadds to /passwd file, if it does not already exist.

Reboot the workstation and log in as cadds.

**Configuration 5: 68020 Server**  
 (300MB and 515MB + 68010/68020 Diskless Clients (1-5) [no disk, no GPU])



**Server (shared space—Full UNIX assumed)**

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]                           |
|---------------|--------------------------------------------|-----------------------------------------------------------------|
| a             | / = root                                   | 9.5                                                             |
| b             | swap20                                     | 28 (basic server swap area)                                     |
| c             | /dev/nd10—5 clients                        | ND (varies per client—see below)                                |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories + CADDs; varies per client—see below) |
| e             | /pub.MC68010                               | 8.75                                                            |
| f             | /pub.MC68020                               | 8.75                                                            |
| g             | /usr.MC68010                               | 40 (Full UNIX + sunwindows + SYSAID)                            |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)                            |
| <b>Totals</b> |                                            | <b>180 (this is total shared space)</b>                         |

| Per User Space Requirements | Disk Space Allocation (MB)                  |
|-----------------------------|---------------------------------------------|
| Swap20                      | 12 (swap space on partition b of server)    |
| Swap10                      | 12 (includes provision for color window)    |
| Client root                 | 6 (temp + user space in HD on server)       |
| <b>Totals</b>               | <b>30 (Total space required per client)</b> |

| # Clients | Shared Space | Available <sup>1</sup> |              | Client Overhead <sup>2</sup> |      | Per User <sup>3</sup> | Totals |
|-----------|--------------|------------------------|--------------|------------------------------|------|-----------------------|--------|
|           |              | 1st disk(MB)           | 2nd disk(MB) | 2nd disk(MB)                 | (MB) |                       |        |
| 1         | 180          | 48                     | 18           | 377                          |      |                       | 425    |
| 2         | 180          | 36                     | 18           | 179                          |      |                       | 215    |
| 3         | 180          | 24                     | 18           | 113                          |      |                       | 137    |
| 4         | 180          | 12                     | 18           | 80                           |      |                       | 92     |
| 5         | 180          | 0                      | 18           | 61                           |      |                       | 61     |

<sup>1</sup> Available space is 240MB (formatted disk) - 180 (shared space) - (12 \* #clients)

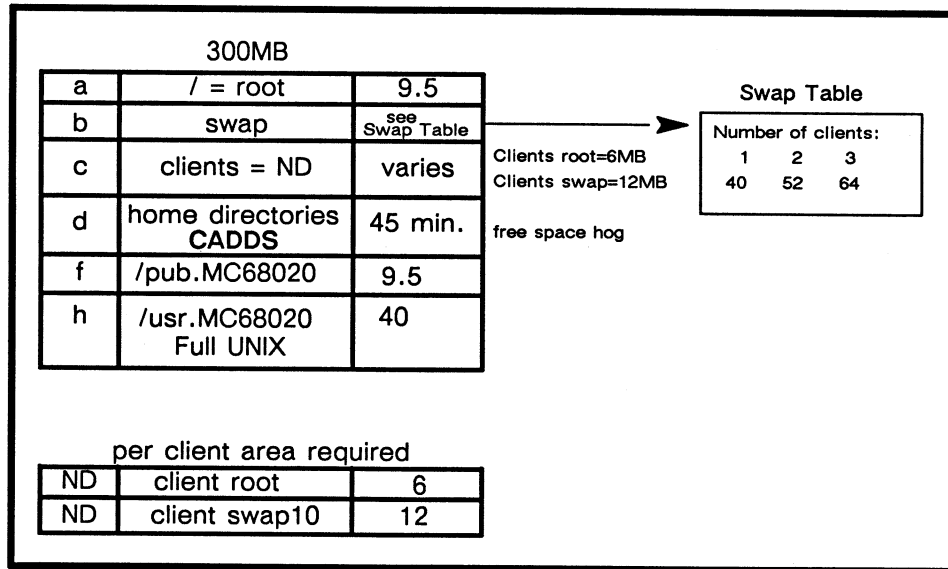
<sup>2</sup> Client Overhead is 12MB (swap20) + 12MB (swap10) + 6MB (client root) = 30MB

<sup>3</sup> Available Per User = Available - Client Overhead + Previous Client Overhead (if any) ÷ number of clients

## PROCEDURE B

- Configuration 6: 68020 Server (Single 300MB + 68020 Clients (1 Client))  
 Configuration 7: 68020 Server (Dual 300MB + 68020 Clients (5 Clients))  
 Configuration 8: 68020 Server (Single 515MB + 68020 Clients (1-6) [no disk, no GPU])  
 Configuration 9: 68020 Server (Dual 515MB + 68020 Clients (1-6) [no disk, no GPU])  
 Configuration 10: 68020 Server (300MB and 515MB + 68020 Clients (1-6) [no disk, no GPU])

### Configuration 6: 68020 Server (Single 300MB + 68020 Clients [3 clients])



### Server (shared space—Full UNIX assumed)

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]                           |
|---------------|--------------------------------------------|-----------------------------------------------------------------|
| a             | / = root                                   | 9.5                                                             |
| b             | swap20                                     | 28 (basic server swap area)                                     |
| c             | /dev/nd10—5 clients                        | ND (varies per client—see below)                                |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories = CADDs; varies per client—see below) |
| f             | /pub.MC68020                               | 9.5                                                             |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)                            |
| <b>Totals</b> |                                            | <b>132 (this is total shared space)</b>                         |

### Per User Space Requirements

|               | Disk Space Allocation (MB)                  |
|---------------|---------------------------------------------|
| Swap (Server) | 12 (swap space on partition b of server)    |
| Swap (Client) | 12 (includes provision for color window)    |
| Client root   | 6 (temp + user space in HD on server)       |
| <b>Totals</b> | <b>30 (Total space required per client)</b> |

| # Clients | Shared Space | Available <sup>1</sup> | Client Overhead <sup>2</sup> | Available Per User <sup>3</sup> |
|-----------|--------------|------------------------|------------------------------|---------------------------------|
| 1         | 132 MB       | 108 MB                 | 30 MB                        | 78 MB                           |
| 2         | 132          | 108                    | 30                           | 24                              |
| 3         | 132          | 108                    | 30                           | 6                               |

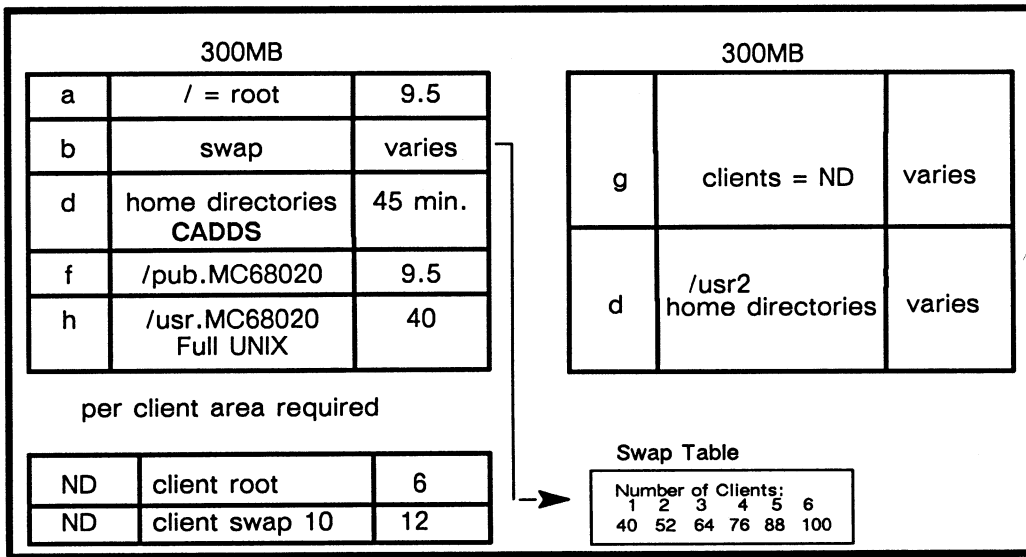
<sup>1</sup> Available space is 240MB (formatted disk) - 132 (shared space) = 108MB

<sup>2</sup> Client Overhead is 12MB (swap20) + 12MB (swap10) + 6MB (client root) = 30MB

<sup>3</sup> Available Per User = Available - Client Overhead + Previous Client Overhead (if any) ÷ number of clients



**Configuration 7: 68020 Server (Dual 300MB + 68020 Diskless Clients (6) )**



**Server (Full UNIX assumed)**

| Partition     | Contents          | Disk Space Allocation (MB) [1st disk]                            |
|---------------|-------------------|------------------------------------------------------------------|
| a             | / = root          | 9.5                                                              |
| b             | swap20            | 28 (basic server swap area + 6MB CADDs text)                     |
| d             | /usr/fileservname | 45 min. ( home directories + CADDs; varies per client--see below |
| f             | /pub.MC68020      | 9.5                                                              |
| h             | /usr.MC68020      | 40 (Full UNIX + sunwindows + SYSAID)                             |
| <b>Totals</b> |                   | <b>132 (this is total shared space)</b>                          |

| Per User Space Requirements | Disk Space Allocation (MB)                  |
|-----------------------------|---------------------------------------------|
| Swap (Server)               | 12 (swap space on partition b of server)    |
| Swap (Client)               | 12 (includes provision for color window)    |
| Client root                 | 6 (temp + user space in HD on server)       |
| <b>Totals</b>               | <b>30 (Total space required per client)</b> |

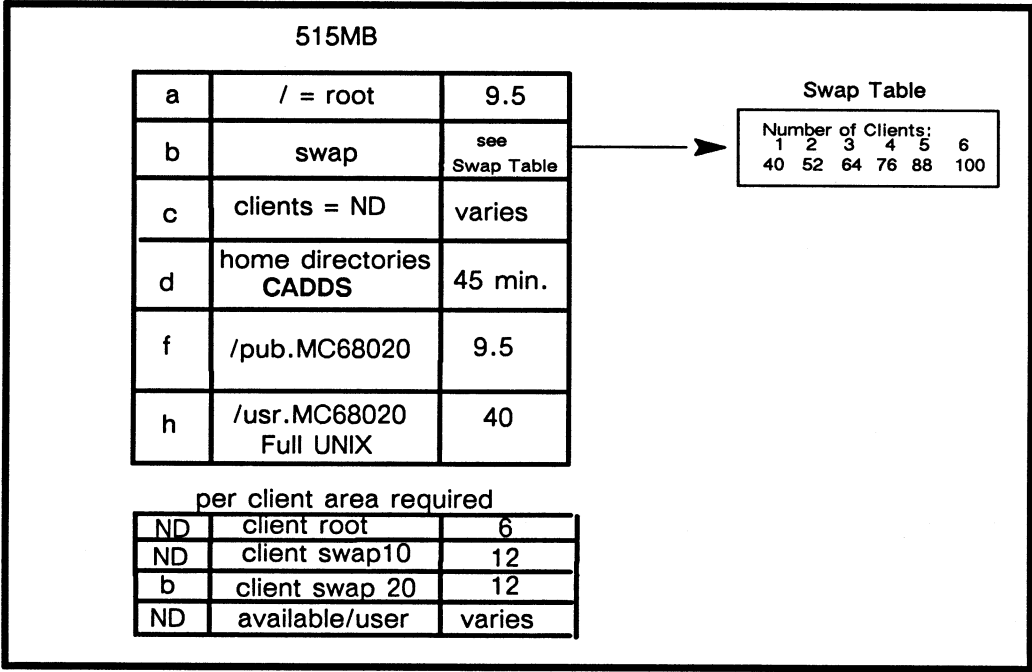
| # Clients | Shared Space | Available <sup>1</sup> |          | Client Overhead |          | Totals |
|-----------|--------------|------------------------|----------|-----------------|----------|--------|
|           |              | 1st disk               | 2nd disk | 2nd disk        | 2nd disk |        |
| 1         | 132MB        | 96 MB                  | 18MB     | 222MB           |          | 318MB  |
| 2         | 132          | 84                     | 18       | 102             |          | 186    |
| 3         | 132          | 72                     | 18       | 62              |          | 132    |
| 4         | 132          | 60                     | 18       | 42              |          | 102    |
| 5         | 132          | 48                     | 18       | 30              |          | 78     |
| 6         | 132          | 36                     | 18       | 22              |          | 60     |

<sup>1</sup> Available space is 240MB (formatted disk) - 132 (shared space) - (12MB \*#clients)

<sup>2</sup> Client Overhead is 12MB (swap10) + 6MB (client root) =18MB

<sup>3</sup> Available Per User = 240MB (formatted 2nd disk) - Client Overhead - Previous Client Overhead (if any) ÷ number of clients

**Configuration 8:** 68020 Server  
(Single 515MB + 68020 Diskless Clients (1-6) [no disk, no GPU])



**Server (shared space—Full UNIX assumed)**

| Partition     | Contents            | Disk Space Allocation (MB) [1st disk]                            |
|---------------|---------------------|------------------------------------------------------------------|
| a             | / = root            | 9.5                                                              |
| b             | swap20              | 28 (basic server swap area + 6MB CADDs text)                     |
| c             | /dev/nd10-5 clients | ND (varies per client—see below)                                 |
| d             | /usr/fileservname   | 45 min. ( home directories + CADDs; varies per client—see below) |
| f             | /pub.MC68020        | 9.5                                                              |
| h             | /usr.MC68020        | 40 (Full UNIX + sunwindows + SYSAID)                             |
| <b>Totals</b> |                     | <b>132 (this is total shared space)</b>                          |

| Per User Space Requirements | Disk Space Allocation (MB)                  |
|-----------------------------|---------------------------------------------|
| Swap (Server)               | 12 (swap space on partition b of server)    |
| Swap (Client)               | 12 (includes provision for color window)    |
| Client root                 | 6 (temp + user space in HD on server)       |
| <b>Totals</b>               | <b>30 (Total space required per client)</b> |

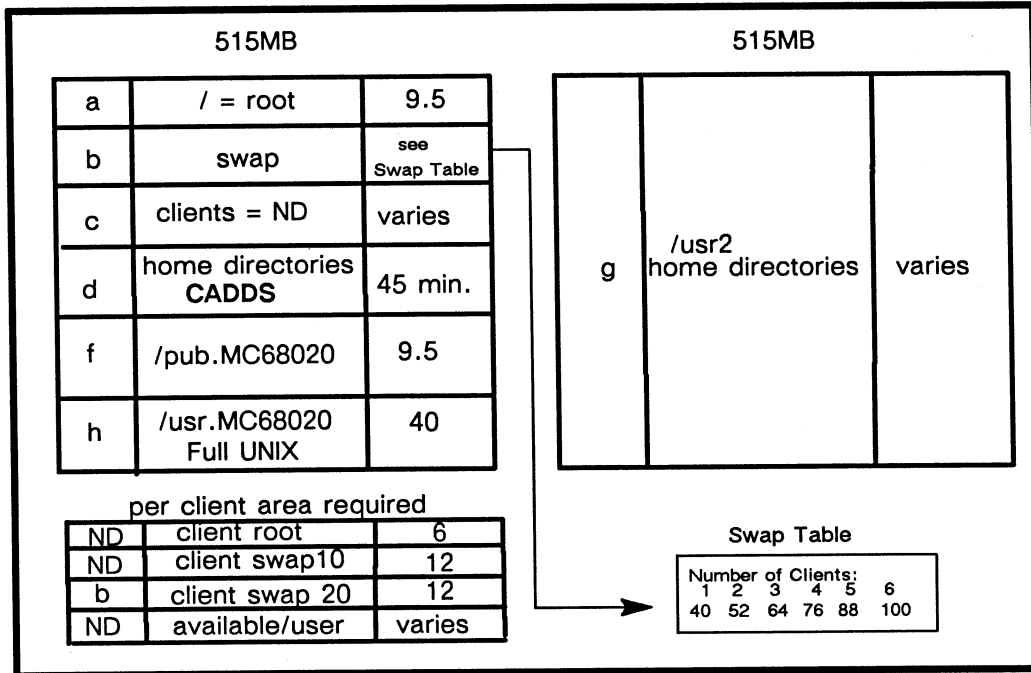
| # Clients | Shared Space | Available <sup>1</sup> | Client Overhead <sup>2</sup> | Available Per User <sup>3</sup> |
|-----------|--------------|------------------------|------------------------------|---------------------------------|
| 1         | 132MB        | 263 MB                 | 30MB                         | 233MB                           |
| 2         | 132          | 263                    | 30                           | 101                             |
| 3         | 132          | 263                    | 30                           | 58                              |
| 4         | 132          | 263                    | 30                           | 36                              |
| 5         | 132          | 263                    | 30                           | 23                              |
| 6         | 132          | 263                    | 30                           | 14                              |

<sup>1</sup> Available space is 395MB (formatted disk) - 132 (shared space) = 263MB

<sup>2</sup> Client Overhead is 12MB (swap20) + 12MB (swap10) + 6MB (client root) = 30MB

<sup>3</sup> Available Per User = Available - Client Overhead + Previous Client Overhead (if any) ÷ number of clients

**Configuration 9: 68020 Server**  
(Dual 515MB + 68020 Diskless Clients (1-6) [no disk, no GPU])



**Server (shared space—Full UNIX assumed)**

| Partition | Contents            | Disk Space Allocation (MB) [1st disk]                            |
|-----------|---------------------|------------------------------------------------------------------|
| a         | / = root            | 9.5                                                              |
| b         | swap20              | 28 (basic server swap area + 6MB CADDs text)                     |
| c         | /dev/nd10-5 clients | ND (varies per client—see below)                                 |
| d         | /usr/fileservname   | 45 min. ( home directories + CADDs; varies per client—see below) |
| f         | /pub.MC68020        | 9.5                                                              |
| h         | /usr.MC68020        | 40 (Full UNIX + sunwindows + SYSAID)                             |
| Totals    |                     | 132 (this is total shared space)                                 |

| Per User Space Requirements | Disk Space Allocation (MB)               |
|-----------------------------|------------------------------------------|
| Swap20                      | 12 (swap space on partition b of server) |
| Swap10                      | 12 (includes provision for color window) |
| Client root                 | 6 (temp + user space in HD on server)    |
| Totals                      | 30 (Total space required per client)     |

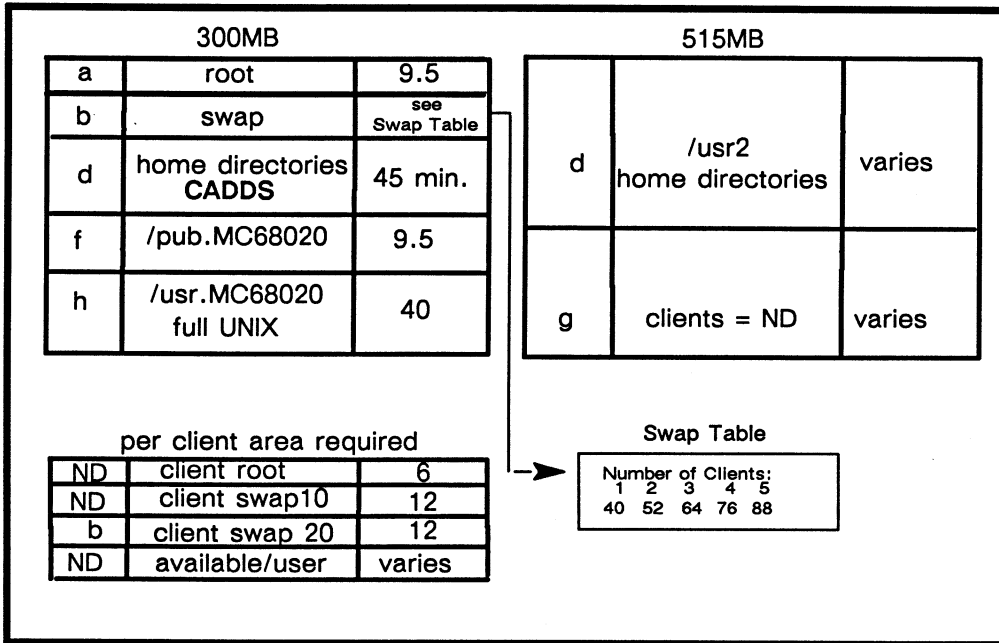
| # Clients | Shared Space | Available <sup>1</sup> | Client Overhead <sup>2</sup> | Available |          | Per User <sup>3</sup> Totals (MB) |
|-----------|--------------|------------------------|------------------------------|-----------|----------|-----------------------------------|
|           |              |                        |                              | 1st disk  | 2nd disk |                                   |
| 1         | 132 MB       | 263MB                  | 30 MB                        | 233       | 395      | 628                               |
| 2         | 132          | 263                    | 30                           | 101       | 197      | 298                               |
| 3         | 132          | 263                    | 30                           | 58        | 132      | 190                               |
| 4         | 132          | 263                    | 30                           | 36        | 99       | 135                               |
| 5         | 132          | 263                    | 30                           | 23        | 79       | 105                               |
| 6         | 132          | 263                    | 30                           | 14        | 66       | 80                                |

<sup>1</sup> Available space is 395MB (formatted disk) - 132 (shared space) = 263MB

<sup>2</sup> Client Overhead is 12MB (swap20) + 12MB (swap10) + 6MB (client root) = 30MB

<sup>3</sup> Available Per User = Available - Client Overhead + Previous Client Overhead (if any) ÷ number of clients

**Configuration 10: 68020 Server**  
**(300MB and 515MB + 68010/68020 Diskless Clients (1-6) [no disk, no GPU])**



**Server (shared space—Full UNIX assumed)**

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]                           |
|---------------|--------------------------------------------|-----------------------------------------------------------------|
| a             | / = root                                   | 9.5                                                             |
| b             | swap20                                     | 28 (basic server swap area)                                     |
| c             | /dev/nd10—5 clients                        | ND (varies per client—see below)                                |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories + CADDs; varies per client—see below) |
| f             | /pub.MC68020                               | 9.5                                                             |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)                            |
| <b>Totals</b> |                                            | <b>132 (this is total shared space)</b>                         |

| Per User Space Requirements | Disk Space Allocation (MB)                  |
|-----------------------------|---------------------------------------------|
| Swap20                      | 12 (swap space on partition b of server)    |
| Swap10                      | 12 (includes provision for color window)    |
| Client root                 | 6 (temp + user space in HD on server)       |
| <b>Totals</b>               | <b>30 (Total space required per client)</b> |

| # Clients | Shared Space | Available <sup>1</sup><br>1st disk(MB) | Client Overhead <sup>2</sup><br>2nd disk(MB) | Available Per User <sup>3</sup><br>2nd disk(MB) | Totals<br>(MB) |
|-----------|--------------|----------------------------------------|----------------------------------------------|-------------------------------------------------|----------------|
| 1         | 132          | 96                                     | 18                                           | 377                                             | 473            |
| 2         | 132          | 84                                     | 18                                           | 179                                             | 263            |
| 3         | 132          | 72                                     | 18                                           | 113                                             | 185            |
| 4         | 132          | 60                                     | 18                                           | 80                                              | 40             |
| 5         | 132          | 48                                     | 18                                           | 61                                              | 109            |
| 6         | 132          | 36                                     | 18                                           | 47                                              | 83             |

<sup>1</sup> Available space is 240MB (formatted disk) - 132 (shared space) - (12 \* #clients)

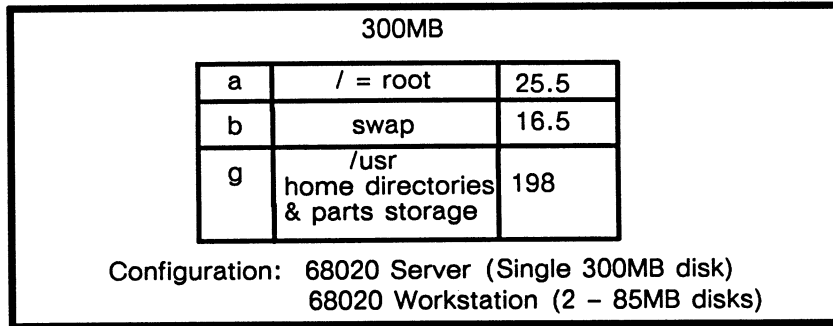
<sup>2</sup> Client Overhead is 12MB (swap20) + 12MB (swap10) + 6MB (client root) = 30MB

<sup>3</sup> Available Per User = Available - Client Overhead + Previous Client Overhead (if any) ÷ number of clients

**PROCEDURE C**

- Configuration 11: 68020 Stand-alone Server (Single 300MB + 68020 Workstations (1-6) [dual 85MB + GPU])
- Configuration 12: 68020 Stand-alone Server (Dual 300MB + 68020 Workstations (1-6) [dual 85MB + GPU])
- Configuration 13: 68020 Stand-alone Server (Single 515MB + 68020 Workstations (1-6) [dual 85MB + GPU])
- Configuration 14: 68020 Stand-alone Server (Dual 515MB + 68020 Workstations (1-6) [dual 85MB + GPU])
- Configuration 15: 68020 Stand-alone Server (300MB + 515MB + 68020 Workstations(1-6) [dual 85MB + GPU])

**Configuration 11: 68020 Stand-alone Server  
(300MB + 68020 Workstations (1-6) [dual 85MB +GPU])**



**Server (Full UNIX assumed)**

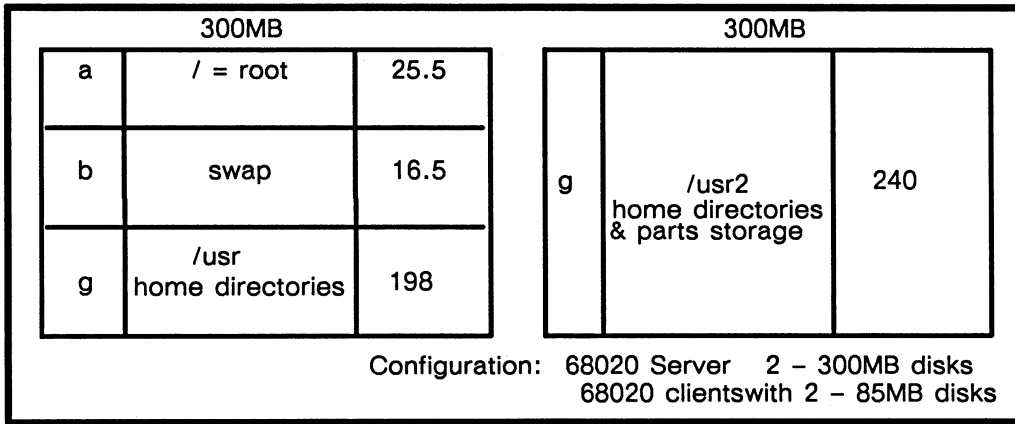
| Partition | Contents | Disk Space Allocation (MB) [1st disk] |
|-----------|----------|---------------------------------------|
| a         | / = root | 25.5                                  |
| b         | swap20   | 16.5 (basic server swap area)         |
| g         | /usr     | 198 (home directories & parts)        |

The following list is per user space available to each workstation on the server:

| # Clients | Available <sup>1</sup><br>1st disk(MB) | Total Available<br>(MB) |
|-----------|----------------------------------------|-------------------------|
| 1         | 198                                    | 198                     |
| 2         | 198                                    | 99                      |
| 3         | 198                                    | 66                      |
| 4         | 198                                    | 49                      |
| 5         | 198                                    | 39                      |
| 6         | 198                                    | 33                      |

<sup>1</sup> Available Per User = 198MB ÷ # of clients  
Available Per User does not include space on the single 85MB disk of the client

**Configuration 12: 68020 Stand-alone Server**  
 (Dual 300MB + 68020 Workstations (1-6) [dual 85MB + GPU])



**Server (Full UNIX assumed)**

| Partition | Contents | Disk Space Allocation (MB) [1st disk] |
|-----------|----------|---------------------------------------|
| a         | / = root | 25.5                                  |
| b         | swap20   | 16.5 (basic server swap area)         |
| g         | /usr     | 198 (home directories & CADDs)        |

The following list is per user space available to each client on the server:

| # Clients | Available <sup>1</sup><br>1st Disk | Available<br>2nd Disk | Total Available Per User <sup>2</sup> |
|-----------|------------------------------------|-----------------------|---------------------------------------|
| 1         | 198MB                              | 240MB                 | 438                                   |
| 2         | 198                                | 240                   | 219                                   |
| 3         | 198                                | 240                   | 146                                   |
| 4         | 198                                | 240                   | 109                                   |
| 5         | 198                                | 240                   | 87                                    |
| 6         | 198                                | 240                   | 73                                    |

<sup>1</sup> Available Per User = 438 MB ÷ # of clients  
 Available per user does not include space left on the single 85MB disk of the client

**Configuration 13: 68020 Stand-alone Server**  
 (Single 515MB + 68020 Workstations (1-6) [dual 85MB + GPU])

|       |                                             |      |
|-------|---------------------------------------------|------|
| 515MB |                                             |      |
| a     | / = root                                    | 25.5 |
| b     | swap                                        | 16.5 |
| g     | /usr<br>home directories<br>& parts storage | 353  |

Configuration: 68020 Server  
 1 - 515MB disk  
 68020 clients  
 with 2 -85MB disk

**Server (Full UNIX assumed)**

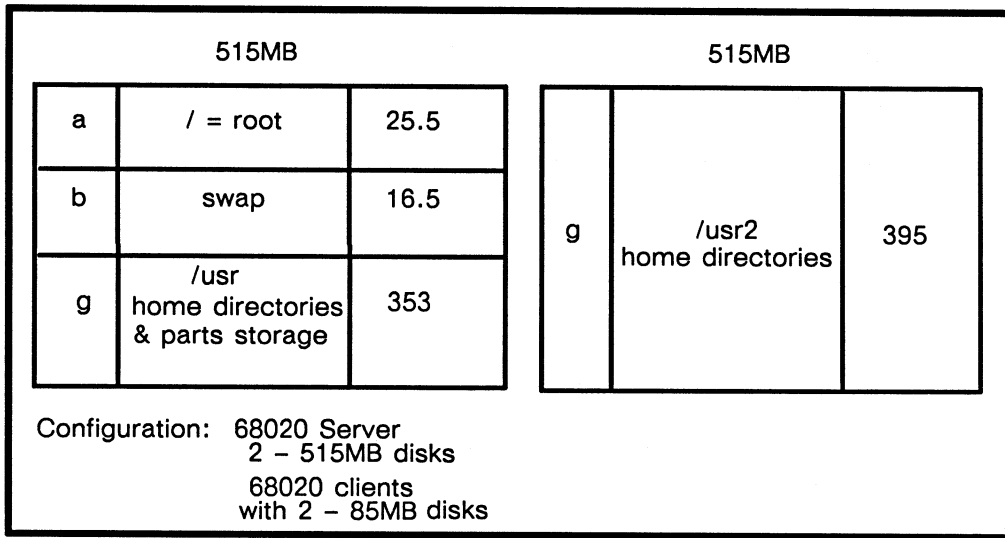
| Partition | Contents | Disk Space Allocation (MB) [1st disk] |
|-----------|----------|---------------------------------------|
| a         | / = root | 25.5                                  |
| b         | swap20   | 16.5 (basic server swap area)         |
| g         | /usr     | 353 (home directories + parts)        |

The following list is per user space available to each client on the server:

| # Clients | Available 1st Disk (MB) | Total Available (MB) | Per User <sup>2</sup> |
|-----------|-------------------------|----------------------|-----------------------|
| 1         | 353MB                   | 353                  |                       |
| 2         | 353                     | 176                  |                       |
| 3         | 353                     | 118                  |                       |
| 4         | 353                     | 88                   |                       |
| 5         | 353                     | 70                   |                       |
| 6         | 353                     | 59                   |                       |

<sup>1</sup> Available Per User = 353MB ÷ # of clients (e.g., 353 ÷ 2 = 176)  
 Available per user does not include space left on the single 85MB disk of the client

**Configuration 14: 68020 Stand-alone Server**  
 (Dual 515MB + 68020 Workstations (1-6) [dual 85MB + GPU])



**Server (Full UNIX assumed)**

| Partition | Contents | Disk Space Allocation (MB) [1st disk] |
|-----------|----------|---------------------------------------|
| a         | / = root | 25.5                                  |
| b         | swap20   | 16.5 (basic server swap area)         |
| g         | /usr     | 353 (home directories + parts)        |

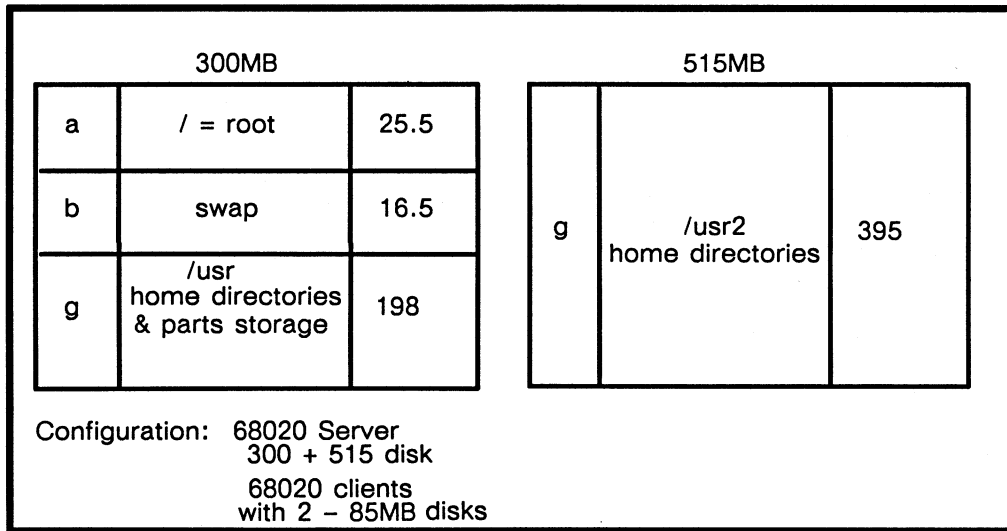
The following list is per user space available to each client on the server:

| # Clients | Available | Available | Total Available Per User <sup>1</sup> |
|-----------|-----------|-----------|---------------------------------------|
|           | 1st Disk  | 2nd Disk  |                                       |
| 1         | 353MB     | 395MB     | 748                                   |
| 2         | 353       | 395       | 374                                   |
| 3         | 353       | 395       | 249                                   |
| 4         | 353       | 395       | 187                                   |
| 5         | 353       | 395       | 150                                   |
| 6         | 353       | 395       | 125                                   |

<sup>1</sup> Available Per User = 748 MB ÷ # of clients (e.g., 748 ÷ 2 = 374)  
 Available per user does not include space left on the single 85MB disk of the client



**Configuration 15: 68020 Stand-alone Server**  
 (300MB and 515MB + 68010 Workstations (1-6) [Dual 85MB + GPU])



**Server (Full UNIX assumed)**

| Partition | Contents | Disk Space Allocation (MB) [1st disk] |
|-----------|----------|---------------------------------------|
| a         | / = root | 25.5                                  |
| b         | swap20   | 16.5 (basic server swap area)         |
| g         | /usr     | 378 (home directories + parts)        |

The following list is per user space available to each client on the server:

| # Clients | Available | Available         | Total Available Per User <sup>1</sup> |
|-----------|-----------|-------------------|---------------------------------------|
|           | 1st Disk  | 2nd Disk(MB) (MB) |                                       |
| 1         | 198MB     | 395               | 593                                   |
| 2         | 198       | 395               | 296                                   |
| 3         | 198       | 395               | 197                                   |
| 4         | 198       | 395               | 148                                   |
| 5         | 198       | 395               | 118                                   |
| 6         | 198       | 395               | 95                                    |

<sup>1</sup> Available Per User = 593 MB ÷ # of clients (e.g., 593 ÷ 2 = 296)  
 Available per user does not include space left on the single 85MB disk of the client

**PROCEDURE D**

- Configuration 16: 68020 Server (Single 300MB + 68020 workstations (1-6) [single 85MB + GPU])
- Configuration 17: 68020 Server (Dual 300MB + 68020 workstations (1-6) [single 85MB + GPU])
- Configuration 18: 68020 Server (Single 515MB + 68020 workstations (1-6) [single 85MB + GPU])
- Configuration 19: 68020 Server (Dual 515MB + 68020 workstations (1-6) [single 85MB + GPU])
- Configuration 20: 68020 Server (300MB + 515MB + 68020 workstations(1-6) [single 85MB + GPU])

**Configuration 16: 68020 Server (300MB + 68020 Workstations (1-6) [single 85MB tapeless + GPU])**

| 300MB |                           |         |
|-------|---------------------------|---------|
| a     | / = root                  | 9.5     |
| b     | swap                      | 28      |
| d     | home directories<br>CADDs | 45 min. |
| f     | /pub.MC68020              | 12.5    |
| h     | /usr.MC68020<br>Full UNIX | 40      |

| per client area required |                |        |
|--------------------------|----------------|--------|
| HD                       | available/user | varies |

Configuration: 68020 Server  
1- 300MB disk

68020 Workstations  
with 1 - 85MB disk

**Server (shared space—Full UNIX assumed)**

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]        |
|---------------|--------------------------------------------|----------------------------------------------|
| a             | / = root                                   | 9.5                                          |
| b             | swap20                                     | 28 (basic server swap area)                  |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories + CADDs)           |
| f             | /pub.MC68020                               | 12.5                                         |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)         |
| <b>Totals</b> |                                            | <b>135 (Total space needed for software)</b> |

The following list is per user space available to each client on the server:

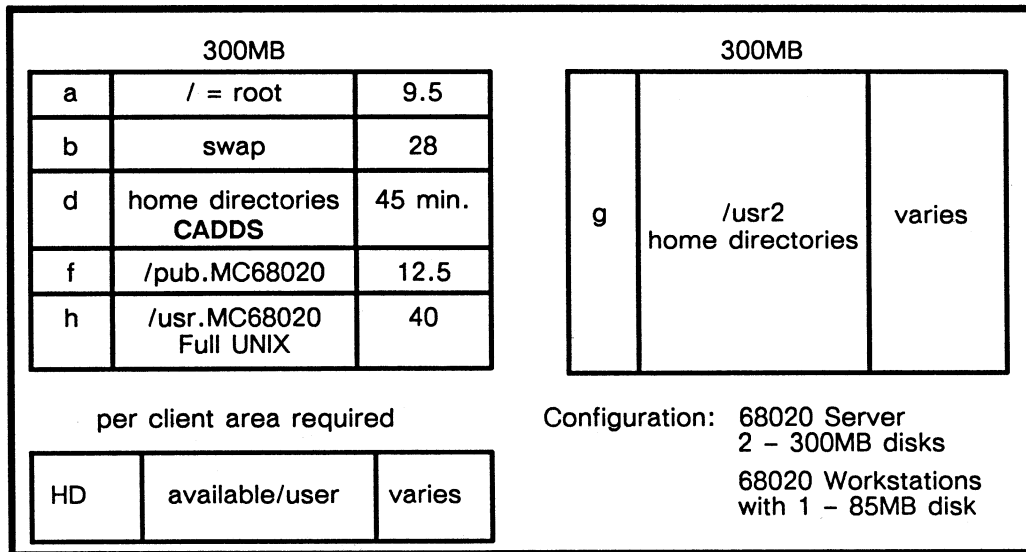
| # Clients | Available <sup>1</sup> | Available Per User <sup>2</sup> |
|-----------|------------------------|---------------------------------|
| 1         | 105                    | 105                             |
| 2         | 105                    | 52                              |
| 3         | 105                    | 35                              |
| 4         | 105                    | 26                              |
| 5         | 105                    | 21                              |
| 6         | 105                    | 18                              |

<sup>1</sup> Available space is 240MB (formatted disk) - 135 (shared space) = 105MB

<sup>2</sup> Available Per User = 169MB ÷ # of clients

Available per user does not include space left on the single 85MB disk of the client

**Configuration 17: 68020 Server**  
**(Dual 300MB + 68020 Workstations (1-6) [single 85MB tapeless + GPU])**



**Server (shared space—Full UNIX assumed)**

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]        |
|---------------|--------------------------------------------|----------------------------------------------|
| a             | / = root                                   | 9.5                                          |
| b             | swap20                                     | 28 (basic server swap area)                  |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories + CADDs)           |
| f             | /pub.MC68020                               | 12.5                                         |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)         |
| <b>Totals</b> |                                            | <b>135 (Total space needed for software)</b> |

The following list is per user space available to each client on the server:

| # Clients | Available <sup>1</sup> |          | Available Per User <sup>2</sup> | Totals |
|-----------|------------------------|----------|---------------------------------|--------|
|           | 1st disk               | 2nd disk |                                 |        |
| 1         | 105                    | 240      |                                 | 345    |
| 2         | 52                     | 120      |                                 | 172    |
| 3         | 35                     | 80       |                                 | 115    |
| 4         | 26                     | 60       |                                 | 86     |
| 5         | 21                     | 48       |                                 | 69     |
| 6         | 18                     | 40       |                                 | 58     |

<sup>1</sup> Available space is 240MB (formatted disk) - 135 (shared space) = 105MB

<sup>2</sup> Available Per User = 424MB ÷ # of clients

Available per user does not include space left on the single 85MB disk of the client

**Configuration 18: 68020 Server**  
**(Single 515MB + 68020 Workstations (1-6) [single 85MB tapeless + GPU])**

| 515MB |                           |         |
|-------|---------------------------|---------|
| a     | / = root                  | 9.5     |
| b     | swap                      | 28      |
| d     | home directories<br>CADDs | 45 min. |
| f     | /pub.MC68020              | 12.5    |
| h     | /usr.MC68020<br>Full UNIX | 40      |

|                          |                |        |
|--------------------------|----------------|--------|
| per client area required |                |        |
| HD                       | available/user | varies |

Configuration: 68020 Server  
 1 - 515MB disk  
 68020 Workstations  
 with 1 - 85MB disk

**Server (shared space—Full UNIX assumed)**

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]        |
|---------------|--------------------------------------------|----------------------------------------------|
| a             | / = root                                   | 9.5                                          |
| b             | swap20                                     | 28 (basic server swap area)                  |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories + CADDs)           |
| f             | /pub.MC68020                               | 12.5                                         |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)         |
| <b>Totals</b> |                                            | <b>135 (Total space needed for software)</b> |

The following list is per user space available to each client on the server:

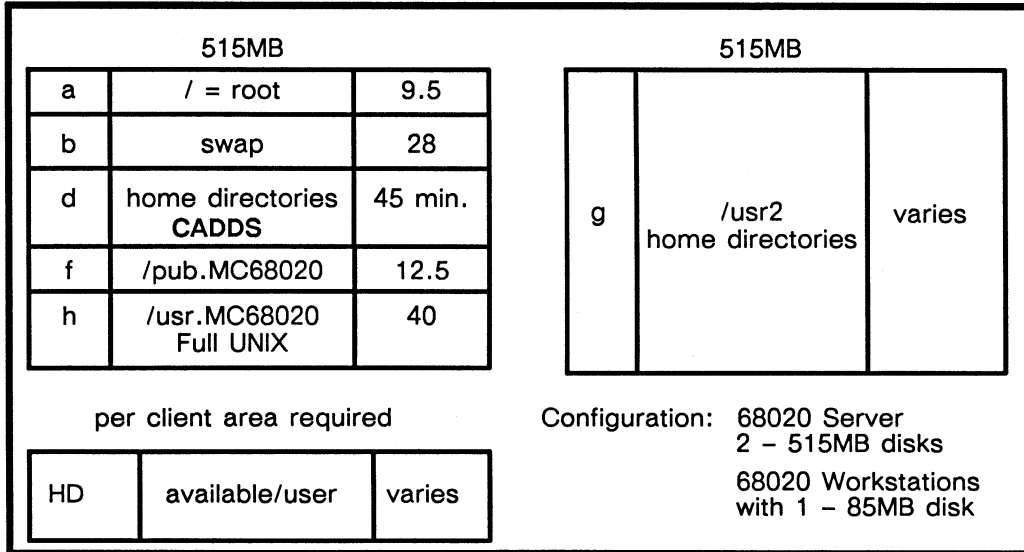
| # Clients | Available <sup>1</sup> | Available Per User <sup>2</sup> |
|-----------|------------------------|---------------------------------|
| 1         | 260                    | 260                             |
| 2         | 260                    | 130                             |
| 3         | 260                    | 86                              |
| 4         | 260                    | 65                              |
| 5         | 260                    | 52                              |
| 6         | 260                    | 43                              |

<sup>1</sup> Available space is 395MB (formatted disk) - 135 (shared space) = 260MB

<sup>2</sup> Available Per User = 260MB ÷ # of clients (e.g., 260 ÷ 2 = 130)

Available per user does not include space left on the single 85MB disk of the client

**Configuration 19: 68020 Server**  
 (Dual 515MB + 68020 Workstations (1-6) [single 85MB tapeless + GPU])



**Server (shared space—Full UNIX assumed)**

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]        |
|---------------|--------------------------------------------|----------------------------------------------|
| a             | / = root                                   | 9.5                                          |
| b             | swap20                                     | 28 (basic server swap area)                  |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories + CADDs)           |
| f             | /pub.MC68020                               | 12.5                                         |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)         |
| <b>Totals</b> |                                            | <b>135 (Total space needed for software)</b> |

The following list is per user space available to each client on the server:

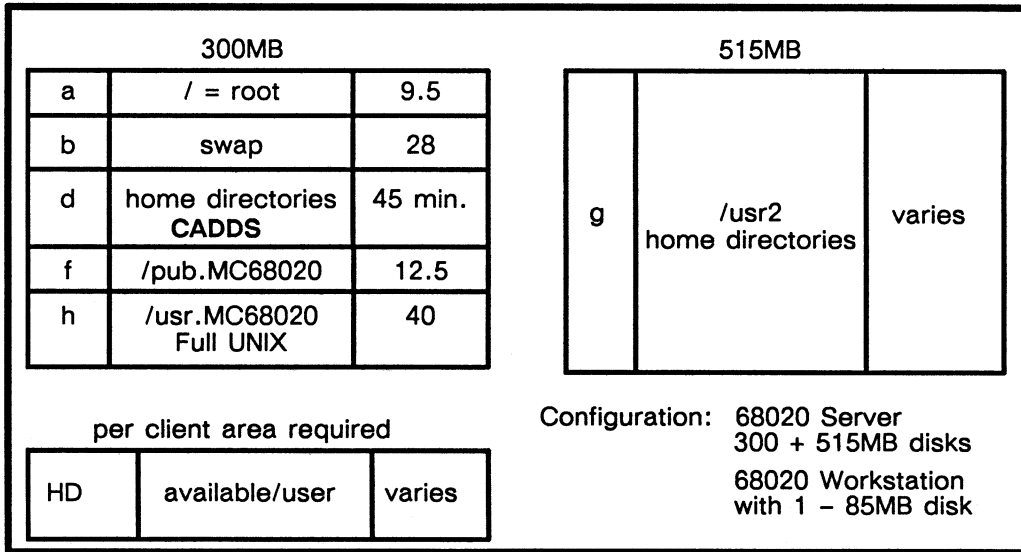
| # Clients | Available | <sup>1</sup> Available Per User <sup>2</sup> | Totals |
|-----------|-----------|----------------------------------------------|--------|
|           | 1st disk  | 2nd disk                                     |        |
| 1         | 260       | 395                                          | 655    |
| 2         | 130       | 197                                          | 327    |
| 3         | 86        | 132                                          | 218    |
| 4         | 65        | 99                                           | 164    |
| 5         | 52        | 79                                           | 131    |
| 6         | 43        | 66                                           | 109    |

<sup>1</sup> Available space is 395MB (formatted disk) - 135 (shared space) = 260MB

<sup>2</sup> Available Per User = 655MB ÷ # of clients (e.g., 655 ÷ 2 = 327)

Available per user does not include space left on the single 85MB disk of the client

**Configuration 20:** 68020 Server  
(300MB + 515MB + 68020 Workstations (1-6) [single 85MB tapeless + GPU])



**Server (shared space—Full UNIX assumed)**

| Partition     | Contents                                   | Disk Space Allocation (MB) [1st disk]        |
|---------------|--------------------------------------------|----------------------------------------------|
| a             | / = root                                   | 9.5                                          |
| b             | swap20                                     | 28 (basic server swap area)                  |
| d             | /usr/fileservname<br>home directories = HD | 45 min. (home directories + CADDs)           |
| f             | /pub.MC68020                               | 12.5                                         |
| h             | /usr.MC68020                               | 40 (Full UNIX + sunwindows + SYSAID)         |
| <b>Totals</b> |                                            | <b>135 (Total space needed for software)</b> |

The following list is per user space available to each client on the server:

| # Clients | Available <sup>1</sup> |          | Totals |
|-----------|------------------------|----------|--------|
|           | 1st disk               | 2nd disk |        |
| 1         | 105                    | 395      | 500    |
| 2         | 52                     | 197      | 249    |
| 3         | 35                     | 132      | 167    |
| 4         | 26                     | 99       | 125    |
| 5         | 21                     | 79       | 100    |
| 6         | 18                     | 66       | 84     |

<sup>1</sup> Available space is 240MB (formatted disk) - 135 (shared space) = 105MB  
Available per user does not include space left on the single 85MB disk of the client

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***Appendixes***

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# Manual Mode of the prepdisk Utility

---

# A

This appendix contains information on using the manual mode of **prepdisk**.

You must use the manual mode of **prepdisk** if any of your disks have no labels (as shown by **prepdisk**).

## Determining SCSI Disk Type, Target Number, and Unit Number

---

In manual mode, **prepdisk** asks you to specify your disk type, target number, and unit number. Locate your workstation's disk configuration in the following figures. Note the target and unit numbers listed in that example. Enter those numbers into the **prepdisk** program.

The CADDStation product line includes a mixture of Adaptec and embedded Small Computer System Interface (SCSI) disk drives. Adaptec-based 50MB disk drives are types C. Adaptec-based 85MB disk drives are types E and I. Embedded SCSI 170MB disk drives are types J and K. Embedded SCSI 380MB disk drives are types N and O. To find what type of disk drives your workstation has, look in the packet of shipping information.

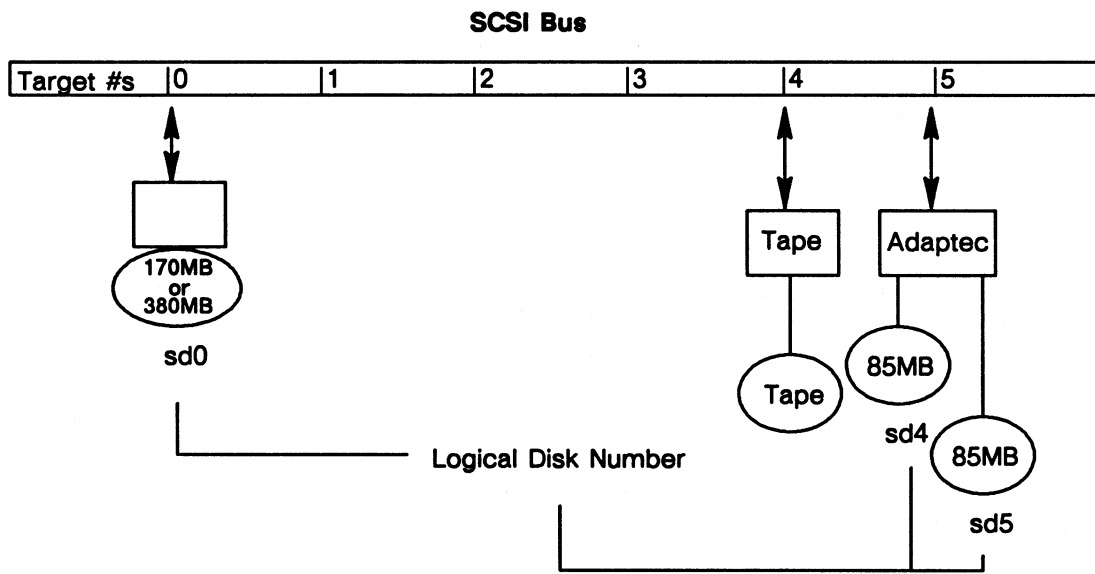
Workstation disk drives can be arranged in five different target locations along the SCSI bus, depending on the number of disks and disk controller boards. Because the Adaptec nonembedded disk controller can support two disks, your system can have two logical unit numbers (Unit # 0 and Unit # 1) on the same controller. Embedded SCSI disk controllers are combined with the disk and thus have only one controller ID number (Unit # 0).



In Figure A-2, the Adaptec controller has been jumpered to target 5, and its disks are referred to as physical disks 1 and 2, logical disks 4 and 5, while the disks themselves are prepdisk unit numbers 0 and 1.

**Note** Disk types J, K, N, and 0 always have a unit number of 0. Disk types E and I are either 0 or 1, depending on the number of units connected to the controller.

Figure A-2. Workstation with One 170MB/380MB and Two 85MB Drives

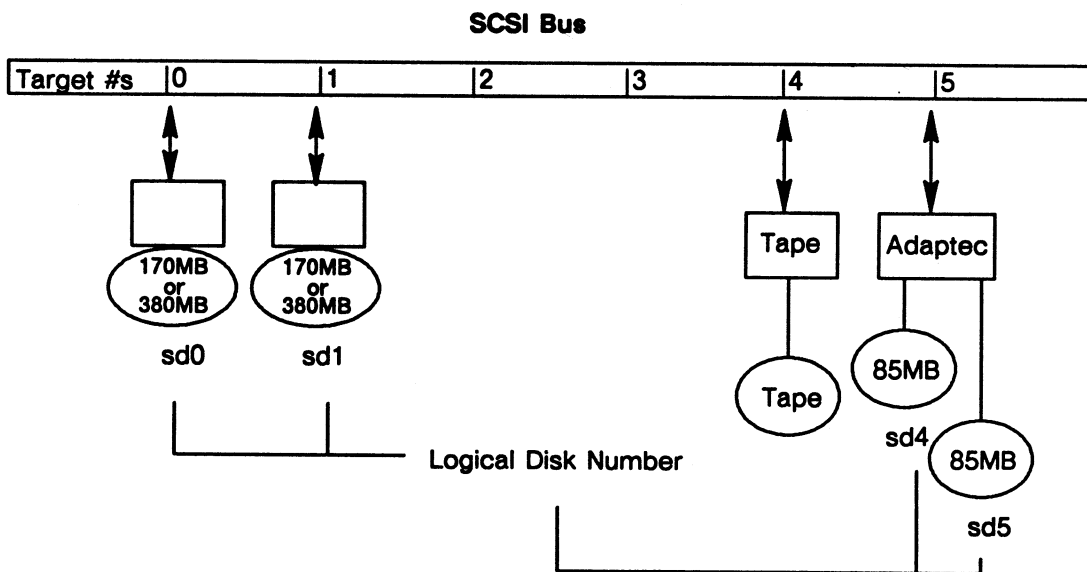


| Logical Drive # | Target # (in prepdisk) | Unit # (in prepdisk) |
|-----------------|------------------------|----------------------|
| 0               | 0                      | 0                    |
| 4               | 5                      | 0                    |
| 5               | 5                      | 1                    |

# Manual Mode of the prepdisk Utility

Figure A-3 shows another arrangement of disks. The different drive numbers are the result of how the bus queries each target. Remember—when organizing such a mixture of SCSI embedded and nonembedded disk drives, prepdisk needs only disk type, target number, and unit number.

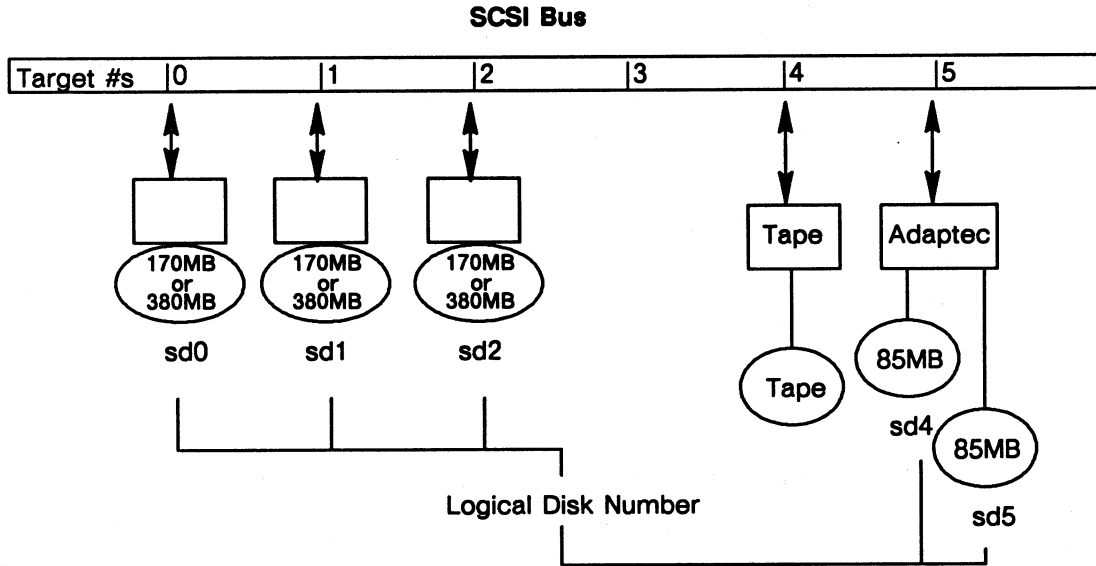
Figure A-3. Workstation with Two 170MB/380MB and Two 85MB Drives



| Logical Drive # | Target # (in prepdisk) | Unit # (in prepdisk) |
|-----------------|------------------------|----------------------|
| 0               | 0                      | 0                    |
| 1               | 1                      | 0                    |
| 4               | 5                      | 0                    |
| 5               | 5                      | 1                    |

Figure A-4 and Figure A-5 complete the examples of SCSI embedded and nonembedded disk combinations.

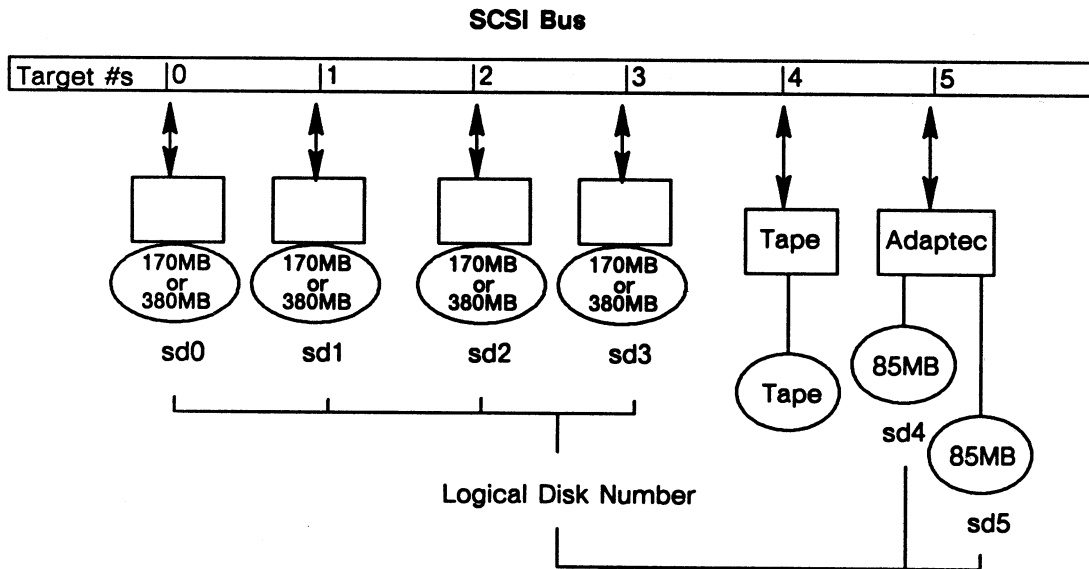
Figure A-4. Workstation with Three 170MB/380MB and Two 85MB Drives



| Logical Drive # | Target # (in prepdisk) | Unit # (in prepdisk) |
|-----------------|------------------------|----------------------|
| 0               | 0                      | 0                    |
| 1               | 1                      | 0                    |
| 2               | 2                      | 0                    |
| 4               | 5                      | 0                    |
| 5               | 5                      | 1                    |

# Manual Mode of the prepdisk Utility

Figure A-5. Workstation with Four 170MB/380MB and Two 85MB Drives



| Logical Drive # | Target # (in prepdisk) | Unit # (in prepdisk) |
|-----------------|------------------------|----------------------|
| 0               | 0                      | 0                    |
| 1               | 1                      | 0                    |
| 2               | 2                      | 0                    |
| 3               | 3                      | 0                    |
| 4               | 5                      | 0                    |
| 5               | 5                      | 1                    |



---

## Manual prepdisk for a SCSI Disk without a Label

---

Use the manual mode of prepdisk for SCSI disks (Types C, E, I, J, K, L, N, O) if you have a SCSI disk without a label.

Follow the example below.

```
CADDStation Prepdisk Disk Initialization and Diagnostic
Rev-3.18 8/12/88. Copyright (c) <1986> by Computervision
Corporation as an unpublished work. All rights reserved.
```

```
Enter "A" to select automatic mode or
 "M" to select manual mode (A/M) ? <CR=A> RETURN
```

Enter RETURN to select automatic mode. A list of disks is shown.

Disk Sizing, please wait for about 1 minute ...

```
0 - target 0/unit 0
 disk type K - 170Mb/134Mb cyl 1016 alt 2 hd 8 sec 34-Embedded SCSI
1 - target 1/unit 0 'Disk Type J', No label found on disk-Embedded SCSI
2 - Manual entry
```

If you have a disk type C, E, or I without a label, it does not appear in the list at all. In this example, the second disk, a type J disk, is missing a label. Enter 2 to select manual entry.

```
Select a disk or type "?" for help <CR=0> ? 2
Defaulting to Manual Selection.
```

Specify controller:

```
0 - CADDServer first controller (xyc0)
 (disk types A, B, R, S, V, W, X, Y or Z)
1 - CADDServer second controller (xyc1)
 (disk types A, B, R, S, V, W, X, Y or Z)
2 - CADDStation controller (sc0)
 (disk types C, E, I, J, K, L, N, or O)
```

```
controller # <CR=2> ? RETURN
```

```
Specify controller address on the Multibus (in hex)
<CR=200000>? RETURN
```

For all SCSI disks the Multibus address for the controller is the default. (The default is 200000 or 140000 depending on the type of CADDStation.) Press RETURN for the default.

```
target # <CR=0> ? 1
```

Enter the target number shown in the list of disks. In this example, the unlabeled disk is on target 1.

The utility asks which type of disk you want to label and shows a list of the choices.

```
Which unit/disk <CR=0> ?
```

# Manual Mode of the prepdisk Utility

| Drive # | Disk Type     | Unformatted/Formatted | Geometry                           |
|---------|---------------|-----------------------|------------------------------------|
| 0       | - disk type C | - 50Mb/41Mb           | 825 cyl 5 alt cyl 6 heads 17 sec   |
| 1       | - disk type E | - 85Mb/67Mb           | 1022 cyl 2 alt cyl 8 heads 17 sec  |
| 2       | - disk type I | - 85Mb/68Mb           | 920 cyl 5 alt cyl 9 heads 17 sec   |
| 3       | - disk type J | - 170Mb/135Mb         | 878 cyl 2 alt cyl 9 heads 35 sec   |
| 4       | - disk type K | - 170Mb/134Mb         | 1016 cyl 2 alt cyl 8 heads 34 sec  |
| 5       | - disk type L | - 170Mb/135Mb         | 815 cyl 2 alt cyl 10 heads 34 sec  |
| 6       | - disk type N | - 380Mb/307Mb         | 1522 cyl 22 alt cyl 9 heads 46 sec |
| 7       | - disk type O | - 403Mb/307Mb         | 1640 cyl 2 alt cyl 12 heads 32 sec |
| 8       | - Other       |                       |                                    |

In this example, choose 3 for disk type J.

```
Enter Drive # <CR=0> ? 3
```

```
Doing inquiry command....ok
```

```
Performing Initialization on selected Disk type :
```

```
status : 6 |Word_mode|Dma_ena|
```

```
Controller set to the following geometry:
```

```
878 cylinders, 2 alternate cylinders, 9 heads, 35 sectors
interleave 1
```

After the initialization is complete, enter the partition command. In manual mode, this command works identically to automatic mode.

```
PREPDISK_MANUAL > partition
```

```
PARTITION Sub-commands menu :
```

```
Quit - quit the Partition command
```

```
Help - print out this menu, additional help if requested
```

```
RP - Recover partition table from disk
```

```
DP - Default partition table
```

```
CP - Current Partition table in memory
```

```
LA - Label the Disk
```

```
PREPDISK_MANUAL/PARTITION > dp
```

```
Is this a primary or secondary disk(P/S) ? <CR=P> s
```

| Partition | Starting | Cylinder | Sectors | Cylinders | Mbytes |
|-----------|----------|----------|---------|-----------|--------|
| c         | 0        |          | 276570  | 878       | 135.04 |
| g         | 0        |          | 276570  | 878       | 135.04 |

```
Do you wish to modify this table(Y/N) ? <CR=N> RETURN
```

```
Use the label command to write out the partition table.
```

```
PREPDISK_MANUAL/PARTITION > label
```

```
Doing inquiry command....ok
```

```
Do you still want to label the disk(Y/N) ? <CR=N> y
```

```
Writing primary label to disk..ok
```

```
Writing backup labels to disk..ok
```

```
PREPDISK_MANUAL/PARTITION > q
```

```
PREPDISK_MANUAL > verify
```

```
Reading primary label from disk..ok
```

```
id: <disk type J - 170Mb/135Mb cyl 878 alt 2 hd 9 sec 35>
```

---

| Partition | Starting Cylinder | Sectors | Cylinders | Mbytes |
|-----------|-------------------|---------|-----------|--------|
| c         | 0                 | 276570  | 878       | 135.04 |
| g         | 0                 | 276570  | 878       | 135.04 |

Doing inquiry command....ok

o Peripheral device type = direct access device

o Non-removable medium

o Device type qualifier = direct access device

o Drive complies with SCSI command set format

o Disk Type = J

o Firmware identification = |36|32|30|36| (hex) 6206 (ascii)

PREPDISK\_MANUAL > q

Return to Section 2 to partition and label other disks.

# Manual Mode of the prepdisk Utility

---

## Manual prepdisk for an SMD Disk without a Label

---

Use this procedure if you have an SMD disk without a label.

An example of using the manual mode of prepdisk to label and partition a 1GB disk, disk type W, that has no label and is on a second controller follows.

CADDStation Prepdisk Disk Initialization and Diagnostic  
Rev-3.18 8/12/88. Copyright (c) <1986> by Computervision  
Corporation as an unpublished work. All rights reserved.

Enter "A" to select automatic mode or  
"M" to select manual mode (A/M) ? <CR=A> RETURN

Disk Sizing, please wait for about 1 minute ...

0 - xyc0 drivetype 0/unit 0  
disk type A - 300Mb/243Mb cyl 820 alt 3 hd 19 sec 32  
1 - Manual entry

The prepdisk utility finds the first disk, a disk type A, that is on the first controller. It does not find the second disk, disk type W, that is on a second controller because the W disk is missing its label.

Select a disk or type "?" for help <CR=0> ? 1  
Defaulting to Manual Selection.

Specify controller:

0 - CADDServer first controller (xyc0)  
(disk types A, B, R, S, V, W, X, Y or Z)  
1 - CADDServer second controller (xyc1)  
(disk types A, B, R, S, V, W, X, Y or Z)  
2 - CADDStation controller (sc0)  
(disk types C, E, I, J, K, L, N, or O)

Specify the type of controller for the disk you are labeling.

controller # <CR=2> ? 1

If the disk you are labeling is on the first controller, the default address is EE40. If you are labeling a disk on a second controller, the default address is EE48.

Specify controller address on the Multibus (in hex)  
<CR=EE48> ? RETURN

For the disks connected to the first controller, the disk's unit number matches the disk number, that is, disk 0 is xyc0 unit 0, disk 1 is xyc0 unit 1, disk 2 is xyc0 unit 2, and so on.

For the disks connected to the second controller, the disk's unit numbers matches the disk number, that is, disk 0 is xyc1 unit 0, disk 1 is xyc1 unit 1, disk 2 is xyc1 unit 2, and so on.

Which unit/disk <CR=0> ? 0

---

| Drive # | Disk Type   | Unformatted/Formatted | Geometry                          |
|---------|-------------|-----------------------|-----------------------------------|
| 0       | disk type A | 300Mb/243Mb           | 820 cyl 3 altcyl 19 heads 32 sec  |
| 1       | disk type B | 300Mb/255Mb           | 1022 cyl 2 altcyl 16 heads 32 sec |
| 2       | disk type R | 515Mb/386Mb           | 758 cyl 2 altcyl 19 heads 55 sec  |
| 3       | disk type S | 515Mb/388Mb           | 705 cyl 6 altcyl 24 heads 47 sec  |
| 4       | disk type V | 1GB/851MB             | 964 cyl 2 altcyl 27 heads 67 sec  |
| 5       | disk type W | 1GB/851MB             | 1735 cyl 2 altcyl 15 heads 67 sec |
| 6       | disk type X | 515Mb/402Mb           | 821 cyl 2 altcyl 15 heads 67 sec  |
| 7       | disk type Y | 515Mb/393Mb           | 758 cyl 2 altcyl 19 heads 56 sec  |
| 8       | disk type Z | 515Mb/396Mb           | 705 cyl 6 altcyl 24 heads 48 sec  |
| 9       | Other       |                       |                                   |

Enter Drive # <CR=0> ? 5

Do you need help information on disk drive types(N/Y) ?  
 <CR=Y> n

Enter Drive Type # <CR=3> ? RETURN

Checking current drive type...ok

The disk is presently formatted to be a drivetype 3 which matches the default drivetype for a disk type W.

Performing Initialization on selected Disk type :

Controller status : 9 |Adr\_24b|Drive\_Rdy|

Drive status :|ready|

Controller PROM Rev-2-A, controller has read vendor flaw list capability.

Controller set to the following geometry:

1735 cylinders, 2 alternate cylinders, 15 heads, 67 sectors interleave 1 drive type 0

PREPDISK\_MANUAL > partition

After the initialization is complete, enter the **partition** command. In manual mode, this command works identically to automatic mode. See Manual **prepdisk** for SCSI Disks in this Appendix or Partitioning and Labeling Your Disks with **prepdisk** in Section 2 for examples of the **partition** command.

## B

This appendix describes the process of upgrading system software. Refer to it whenever you receive a new revision of the software.

Regardless of the version of the system you are running, when you upgrade your software, the operating system (root) and the /usr file systems are rebuilt. You should save a few groups of files from the current system before installing the new system software. After the upgrade, these files save you time getting the system to run on the network and obtaining the same configuration and protection. At the end of the installation procedures, you will also be saving and restoring files in user home directories.

The easiest way to upgrade the software is to follow these steps:

1. Save all system administration files that you have customized (see Table B-1) and all user files on your existing system. Urge system users to remove any unnecessary files before you save their directories on tape.
2. Perform a bootstrap of the distribution tapes as if you were installing the software release on a brand new machine. Note that you probably need to run one surface analysis pass when formatting (unless you want to repartition your disk or you suspect disk corruption).
3. Restore the saved files to the new system.

The following material describes the above steps in detail.

## Saving Files

---

Table B-1 lists system administration files that you probably have customized. Save these files, user files, and any other files you have added or customized.

---

**NOTE** As system administrator, you should keep track of all files that you (or other users) add or customize so that you can save them prior to software upgrades.

As shown in this list, you may want to make backup copies of five files that may contain information that you want to merge into your new files after the upgrade. Copy `/etc/fstab`, `/etc/nd.local`, `/etc/rc.local`, `/etc/networks`, and `/usr/lib/sendmail.cf` to `/etc/fstab.back`, `/etc/nd.local.back`, `/etc/rc.local.back`, `/etc/networks.back`, and `/usr/lib/sendmail.cf.back` respectively.

---

**Table B-1. Files to Save When Upgrading**

---

| File                                   | Contents                                                                                    |
|----------------------------------------|---------------------------------------------------------------------------------------------|
| <code>/.rhosts</code>                  | Enables <code>root</code> to log in from listed systems                                     |
| <code>/etc/fstab.back</code>           | Copy <code>/etc/fstab</code> here; disk configuration data                                  |
| <code>/etc/group</code>                | Group data base                                                                             |
| <code>/etc/hosts</code>                | System data base for network communication                                                  |
| <code>/etc/hosts.equiv</code>          | List of trusted hosts on your network                                                       |
| <code>/etc/nd.local.back</code>        | Copy <code>/etc/nd.local</code> here; network disk local initialization file                |
| <code>/etc/networks.back</code>        | Copy <code>/etc/networks</code> here; list of Internet networks                             |
| <code>/etc/passwd</code>               | User data base                                                                              |
| <code>/etc/printcap</code>             | Printer capability data base                                                                |
| <code>/etc/rc.local.back</code>        | Copy <code>/etc/rc.local</code> here; for any local additions                               |
| <code>/private</code>                  | Diskless client private configuration files                                                 |
| <code>/usr/lib/aliases</code>          | Mail forwarding data base                                                                   |
| <code>/usr/lib/crontab</code>          | <code>cron</code> daemon data base                                                          |
| <code>/usr/lib/sendmail.cf.back</code> | Copy <code>/etc/lib/sendmail.cf</code> here; mail system file                               |
| <code>/usr/lib/uucp/*</code>           | For local <code>uucp</code> configuration files                                             |
| <code>/usr/local</code>                | For locally developed programs                                                              |
| <code>/usr/spool/*</code>              | For <code>mail</code> , <code>news</code> , <code>uucp</code> , and print spool directories |
| <code>/.login</code>                   | <code>root</code> log-in start-up script                                                    |
| <code>/.profile</code>                 | <code>root sh</code> log-in start-up script                                                 |
| <code>/.cshrc</code>                   | <code>root csh</code> start-up script                                                       |

If your users program, also check the following for changes:

|                              |                                                       |
|------------------------------|-------------------------------------------------------|
| <code>/usr/include</code>    | For local subdirectory and any other additions        |
| <code>/usr/lib/font</code>   | For locally developed font libraries                  |
| <code>/usr/lib/tabset</code> | For locally developed tab setting files               |
| <code>/usr/lib/tmac</code>   | For locally developed <code>troff/nroff</code> macros |
| <code>/etc/gettytab</code>   | <code>tty</code> port speeds data base                |
| <code>/etc/remote</code>     | Remote hosts description data base                    |
| <code>/etc/ttys</code>       | Terminal line configuration data                      |
| <code>/etc/ttytype</code>    | Terminal line to terminal type mapping data           |
| <code>/etc/termcap</code>    | Terminal configuration data                           |

---

---

Follow these steps:

1. Save the files listed in Table B-1 on a separate tape.
2. Make a tape containing users' files by mounting a blank 1/4-inch tape and running the following `tar(1)` command. Replace `usera...` with the names of all users on your system. You can check the names of your users by looking in the `/etc/passwd` or by doing `ls /usr` (or `/usr2`, etc.).  

```
tar cvfp /dev/nrst0 /usr/{spool,usera,userb,userc,userd...}
```
3. After saving the appropriate files, the next step is to dump all your system's software to tape with `/etc/dump`. (See *Managing the System* in the *CADDStation Systems Manager Guide*, and `dump(8)` for more information). This tape is not used to rebuild the system; it is a back-up measure to protect your file system in case of an emergency.
4. When you have completed your system dump, install the new release from the distribution tape. To install the new release, follow procedures described in this manual, with the following exception: you can find your network number and host number in the `/etc/hosts` file. The host number is the last number on the line. After installing UNIX from tape, proceed with Merging Old Files.

## Merging Old Files

---

When your system is booting reliably and `root` and `/usr` file systems are fully installed, you are ready to proceed to the next step in the conversion process: merging your old files into the new system.

1. Using the first `tar` tape you created in Saving Files, extract appropriate files into a scratch directory (to avoid writing over the newer file copy):

```
mkdir /usr/convert
cd /usr/convert
tar xvpf /dev/rtape0 Where tape = st (1/4-inch)
 or mt (1/2-inch)
```

Next you can simply copy certain files, such as those from `/etc`, into place. For example

```
cp fstab.back /etc/fstab
cp crontab /usr/lib
```

If you are on the network, and not on a server, change your `/etc/host` file to include another working system. Other files, however, must be merged into the distributed versions by hand.

2. Now restore the user files (saved on the second `tar` tape).

```
cd /
tar xvpf /dev/rtape0 Where tape = st (1/4-inch)
 or mt (1/2-inch)
```

Be sure to use the `tar -p` option to re-create files with same file modes.



# Upgrading UNIX

---

## Loading Additional UNIX Software

---

To load additional UNIX software onto a stand-alone or server, issue the following command:

```
/usr/etc/extract-release tape type keywords
```

where

*tape*—st or mt

*type*—tapeful or tapeless *server-name*

*keywords*—listed software packages

Tape1:

|              |                                              |
|--------------|----------------------------------------------|
| CADDS_relink | CADDS Relink option                          |
| desktop      | UIM programs                                 |
| ppt          | Paper punch tape reader                      |
| ghc          | Graphics hardcopy                            |
| nat          | Network Administration Tool                  |
| network      | Networking tools and programs                |
| sundiag      | SUN On-line Diagnostic                       |
| sys          | Kernel configuration files                   |
| sys_util     | Additional system utilities                  |
| suntools     | SunWindows additional programs and libraries |

Tape 2:

|              |                                  |
|--------------|----------------------------------|
| uucp         | UUCP programs                    |
| system_V     | System V programs and libraries  |
| text         | Text processing tools            |
| devel        | Software development package     |
| sunpro       | SunPro                           |
| fortran      | Fortran compiler and libraries   |
| pascal       | Pascal interpreter and compiler  |
| sunview_libs | SunWindows programmers' programs |
| tablet       | Tablet libraries                 |
| kanji        | Kanji libraries                  |
| uim_lib      | UIM libraries                    |
| debug        | Debugging tools                  |
| sccs         | Source Code Control System       |
| setup        | setup tool                       |

Tape 3:

|            |                                           |
|------------|-------------------------------------------|
| j_manual   | Japanese manuals                          |
| j_optional | Japanese optional UNIX commands and files |
| j_software | Japanese software development package     |
| j_install  | Japanese UNIX install testing             |

## Loading Additional UNIX Software on a 68010 Client

To load additional UNIX software onto a 68010 client, log in to the server and issue this command:

```
server# /etc/netroot on
```

---

On each client, check `/etc/fstab` to see if your `/usr` file system is read-only. If it is, change it to read-write and reboot your client. Once your workstation is again up and running, issue the following command:

```
client# /usr/etc/extract_release tape type keywords
```

After loading all additional software, issue the following command on the server:

```
server# /etc/netroot off
```

# Summary of Software Package Loading Methods

---



This appendix lists software packages, the method you use to load them, and what tapes the packages are located on. The rules that apply for each method follow.

## **loadappl**

---

If a package is listed as being loaded with **loadappl**, it means that if you load it from tape, the system you load it on must have a license on its License Manager for every package you are loading. In all cases, if you have the software already loaded on another system, you can copy it from the loaded system.

The system you are copying to must be correctly configured for the packages you are copying. If you copy an assembled CADDs, you must have configured the second system for that exact set of CADDs and applications.

You must know which directories apply to the package you are trying to copy. You may *not* use the **rcp** command, which will not preserve links. You must use the special **tar** command format shown in Copying CADDs to other Systems in Section 6.

To run most CADDs applications, you must have a license on the License Manager on the system with the GPU or the GAB. To run CADDs applications that run at operating system level, such as the Electronic Calculator, you must have a license on the License Manager on the system itself, even if it is running CADDs remotely from another system.

To load software packages from the Platform Applications Tape, you a license on a License Manager. To run packages from the Platform Applications Tape, you do not need a license on the system.

## **getappl**

---

You use the old **getappl** command to load three packages: Tech Pubs, HILO-3, and Spaceplan. You do not need a License Manager to load or run these packages. You cannot move a license for any of these packages from one system to another.

# Summary of Software Package Loading Methods

---

## setup and extract\_release

UNIX and its options are on UNIX Tapes #1, #2, and #3. To initially load any of this software, you use the **worksheet** and **setup** utilities outline in Sections 1-4.

To load extra UNIX software from these three UNIX tapes that you did not load the first time, use the **/usr/etc/extract\_release** command. On-line directions show what software you can choose and when to load the correct tape.

## tar

A few packages can be taken off the tape using a normal **tar** command.

## Software Packages and Loading Methods

The following software tapes are all load using **loadappl**. This list may be incomplete.

UNIX Tape 1 68020  
UNIX Tape 2 68020  
UNIX Tape 3 68020  
UNIX Tape 1 68010  
UNIX Tape 2 68010  
Platform Appl. #1  
Platform Appl. #2  
AEC Library #1  
AEC Library #2  
CV PD Library #1  
CV PD Library #2  
CV PD Library #3  
Spaceplan  
Automeasure Lib.  
Drafteze Library  
Autonest (CVPNA)  
CVGPII  
Moldesign  
ACL English  
ACL French  
ACL German  
CimStation  
Wave Front Images  
Post Processors  
Factoryvision  
German DMENUS  
PC Client  
CADDs Object #1  
CADDs Object #2  
CADDs Object #3  
CADDs Addt'l #1

---

CADDS Addt'l #2  
CADDS Addt'l #3  
CADDS Documenta.  
DDF Tape  
CVGPU (Tape Util)  
Prog. 0500  
Prog. 0550  
Prog. 0560  
Eng. Prod. Pck. #1  
Eng. Prod. Pck. #2  
On-line Rel. Bul.  
AEC Supplemental  
Schematic Appl.  
CADAT/SABER  
Autoboard #1  
Autoboard #2  
Electrical Dmenus  
Elec. Mech. Gateway  
PDM Client (c.s.)  
PDM (VMS)  
IGES (VMS)  
O/S w/ CFA (4000)  
TCP/IP Tape (4000)  
Text Font Generator

The following software tapes are all load using **getappl**. This list may be incomplete.

Hilo-3  
Eng. Doc. Tape  
Eng. N/Book #1  
Eng. N/Book #2  
Eng. N/Book #3  
Eng. N/Book #4  
Eng. N/Book #5  
Eng. N/Book #6

## Messages from the Boot Procedure

---



On the central processor unit (CPU) board of your Computervision workstation is a set of ROMs that contain a program called the Programmable Read Only Memory (PROM) monitor. The PROM monitor controls any operation performed on your system before the UNIX kernel takes control. This appendix explains how to boot UNIX manually and lists PROM monitor messages.

Subsections in this appendix cover the monitor's start-up, bootstrap functions, and messages that the monitor and boot program can display. Under normal circumstances, the monitor automatically boots the UNIX system. This means that after the initial power-on, no manual intervention is required.

# Messages from the Boot Procedure

---

## Power-On, Self-Test Procedures

---

When you first power on your system, the monitor runs a quick self-test procedure that can have one of these results:

- No errors are found and system begins automatic boot process.
- Noncritical errors are reported; system begins the automatic boot process.
- Critical errors are found; screen remains dark (contact Field Service).
- No video board is found.

To check serial ports, see the *CADDStation Systems User Guide*.

When self-test finds no errors, this display results when you power on your workstation:

```
Self Test completed successfully.
Workstation, Model model number, type of keyboard.
ROM Rev N, some number MB memory installed
Serial #some number, Ethernet address n:n:n:n:n
Auto-boot in progress...
```

Noncritical errors result in a display like the following:

```
Self Test found a problem in something
Wrote wdata at address addr, but read rdata
Damage found, damages
Workstation, Model model number, type of keyboard.
ROM Rev N, some number MB memory installed
Serial #some number, Ethernet address n:n:n:n:n
Auto-boot in progress...
```

|                  |                                                                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Where            |                                                                                                                                                                   |
| <i>something</i> | Malfunctioning part of system.                                                                                                                                    |
| <i>wdata</i>     | Data expected when system is functioning normally.                                                                                                                |
| <i>addr</i>      | Address where data was read/written: for memory errors, this is a physical memory address; for other errors, address interpretation depends on <i>something</i> . |
| <i>rdata</i>     | Data, read back from <i>addr</i> , found invalid because it is not same as <i>wdata</i> .                                                                         |
| <i>damages</i>   | List of all subsystems found to have errors and information about last error.                                                                                     |

---

## Boot Procedures

---

The next two subsections show the automatic and alternative boot procedures.

### Automatic Boot Procedure

The monitor immediately tries to boot from a default device:

```
Auto-boot in progress,
Boot: disk (0,0,0)vmunix
Load: disk (0,0,0)boot
Boot: disk (0,0,0)vmunix,
Size: 215040+24576+30916 bytes
UNIX 4.2, etc...
```

**Where**

|               |                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>disk</i>   | Device name of the local or network disk.                                                                                                                                   |
| <i>vmunix</i> | File booted from <i>disk</i> ; <i>vmunix</i> does not have to contain a UNIX kernel, it can contain any program as long as the disk is in standard UNIX file system format. |

It is also possible to set up the disk to boot a small program not in a UNIX file system. The above discussion assumes the disk is set up for UNIX.

### Booting from Specific Devices

You can boot your workstation from a logical disk partition, a network disk partition, or a local tape drive. (The monitor automatically attempts to boot *vmunix* from a default disk.) To boot a different program, or boot from a different device, abort the automatic boot process with L1-A. To determine devices your monitor ROMs are able to boot, enter *b ?* at the *>* prompt. Devices are then listed.

### Booting from the Monitor

To boot from the monitor, enter the following command:

```
> b device(parameters)pathname args
```

**Where**

|                   |                                                                                    |
|-------------------|------------------------------------------------------------------------------------|
| <i>device</i>     | Type of hardware to boot from                                                      |
| <i>parameters</i> | Specify device address or partitioning                                             |
| <i>pathname</i>   | Name of the actual file (in a UNIX file system on that device) to boot into memory |
| <i>args</i>       | Optional arguments to the program                                                  |



# Messages from the Boot Procedure

---

## Booting from a Disk Drive

To boot from the disk drive, enter the following command:

```
> b controller(address,drive,partition)pathname args
```

Where

*controller* Name of disk controller running specific disk: xy (SMD), sd (SCSI), or ip (other)

*address* Physical address of controller on the Multibus

*drive* Unit number of disk on specific controller

*partition* Logical disk partition where file specified by *pathname* can be found (where zero = partition a, 1 = b, etc.)

## Booting from a Network Disk

To boot from network disk, enter the following command:

```
> b controller(address, hostnumber, partition)pathname args
```

Where

*controller* Device abbreviation for Ethernet Controller: ec (3COM) or ie (SUN-2) or le (Lance Ethernet)

*address* Physical address of controller on the Multibus

*hostnumber* Unique number (0-255) assigned to each machine on local network

*partition* Desired public partition on server (see */etc/nd.local* file)

## Booting from Tape

To boot from tape, enter the following command:

```
> b tape(controller,unit,filenumber)
```

Where

*tape* Abbreviation for tape controller: mt (9-track), or st (SCSI)

*controller* Multibus address of controller

*unit* Tape drive to be used

*filenumber* Number of file on tape to be booted (where first file = #0, second = #1, etc.)

Monitor ignores supplied value of *filenumber* and can only boot the first file on a tape. To boot a file farther down the tape, use monitor to start the boot program. CADDStation system software tapes always have the boot program as the first file of the tape.

## Booting Files from the Default Device

To boot from the default device, enter the following command:

```
> b pathname args
```

This command line is useful for booting stand-alone utility programs after your disk is loaded or for trying new versions of the UNIX kernel.

---

## Messages from the Monitor and the Boot Program

---

These messages are most likely to appear during software installation, during I/O to disk and tape, and during boot-up.

Table D-1 lists messages from the monitor and boot program and their causes.

**Table D-1. Messages from the Monitor and Boot Program**

| Message                                                     | Cause                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Abort at <i>aaaaaa</i>                                      | <p>The monitor stopped execution of the current program because you entered the <i>abort sequence</i> from the keyboard (upper left L1 key held while pressing A), or pressed BREAK on a serial console. <i>aaaaaa</i> is the address of the next instruction.</p> <p>Continue the program by entering the <i>c</i> command.</p> |
| Address Error, addr: <i>xxxxxx</i> at <i>aaaaaa</i>         | <p>The current program stopped because it tried to access an invalid memory location. <i>xxxxxx</i> is the (invalid) address; <i>aaaaaa</i> is an address close to the instruction that failed (typically two to ten bytes beyond). There is no general way to recover from this error.</p> <p>Debug the program.</p>            |
| Auto-boot in progress...                                    | <p>The monitor has finished its power-on sequence and is looking for a good device from which to boot the UNIX system.</p>                                                                                                                                                                                                       |
| Bad device                                                  | <p>The current program (possibly the boot program) has tried to open a file without a device name (e.g., <i>xy</i>). This may mean that the boot command you typed had no device name.</p>                                                                                                                                       |
| Bad format                                                  | <p>The boot program tried to boot from a file that is not in a standard UNIX <i>a.out(5)</i> format. The boot program can only boot files that are in this format, which is generated by the <i>ld(1)</i> command.</p>                                                                                                           |
| <i>bn negative</i><br><i>bn ovf dd</i><br><i>bn void dd</i> | <p>A stand-alone program (such as the boot program) tried to read a file from disk or net disk and encountered an unreadable block number. <i>dd</i> is the invalid block number.</p>                                                                                                                                            |
| Boot:                                                       | <p>The boot program is waiting for you to specify a device and file name to boot. The boot program accepts the same commands that the monitor would, without the initial <i>b</i>. See the subsection called Booting from Specific Devices.</p>                                                                                  |

# Messages from the Boot Procedure

---

Table D-1. Messages from the Monitor and Boot Program (cont)

---

| Message                                                                                                                    | Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Boot:</b> <i>dev(ctrl,unit,part)name options</i>                                                                        | <p>The monitor or boot program is preparing to boot the specified file from the specified device. Either you typed a boot command, or this is an auto-boot after power-on.</p> <p><i>dev</i> Device type; <i>ctrl</i>, <i>unit</i>, and <i>part</i> are the controller, unit-within-controller, and disk partition number.</p> <p><i>name</i> Name of the file to boot from, if any.</p> <p><i>options</i> Arguments for the booted program, such as <i>-s</i>.</p> <p>If you enter a boot command to the monitor, this message will be printed twice: once by the monitor and once by the boot program.</p> |
| <b>boot failed</b>                                                                                                         | <p>The boot program has tried to boot the device and/or file you specified, but could not. A message preceding <b>boot failed</b> should give more details about why. (You may need to check your controller board.)</p>                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Boot syntax:</b> <i>b [!][dev(ctrl,unit,part)] name [options]</i><br><b>boot syntax:</b> <i>dev(ctrl,unit,part)name</i> | <p>You have entered an invalid boot command.</p> <p>This message shows the format of the boot command. The first form is used by the monitor; the second (without the <i>b</i>) is used by the boot program. (Do not type the brackets; they indicate optional parts of the command.)</p>                                                                                                                                                                                                                                                                                                                    |
| <b>Bus Error, addr:</b> <i>xxxxxx at aaaaaa</i>                                                                            | <p>The current program has stopped because it tried to access an invalid memory location. The reason for the error is shown before this message. <i>xxxxxx</i> is the memory location; <i>aaaaaa</i> is a memory location near the instruction that tried the access. There is no way to recover from this error. Debug the program.</p>                                                                                                                                                                                                                                                                     |
| <b>Can't write files yet...Sorry</b>                                                                                       | <p>The current program tried to write to a disk or network disk file through the stand-alone I/O system. Writing on files (as opposed to writing on devices) is not supported when running stand-alone (before booting the UNIX kernel).</p>                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Corrupt label</b>                                                                                                       | <p>The monitor or boot program tried to boot from a disk. The first sector of the disk appears to be a label (as it ought to be), but the checksum on the label is wrong. Try again a few times; if the problem recurs, you should probably relabel your disk. Before relabeling your disk, make sure that you know what should be in the label—writing the wrong label on the disk will probably cause destruction of some or all files on the disk.</p>                                                                                                                                                    |

---

Table D-1. Messages from the Monitor and Boot Program (cont)

---

| Message                                                     | Cause                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Corrupt label on head <i>h</i> disk.<br>count= <i>ddd</i> ? | A stand-alone program tried to write to a device and specified a block size, <i>ddd</i> , that is not a multiple of 512. The write proceeds anyway, but may cause incorrect results.                                                                                            |
| Damage found, <i>damage</i> ...                             | As part of the power-on, self-test procedure, the monitor has found damage in one or more parts of the system. <i>damage</i> is a list of subsystem names, such as <i>memory</i> or <i>timer</i> .<br><br>Report the message to your service representative.                    |
| Exception <i>ee</i> at <i>aaaaaa</i>                        | The current program stopped because it received an interrupt. The interrupt could have been caused either by hardware or software.<br><br><i>ee</i> Hexadecimal address of the interrupt vector used.<br><i>aaaaaa</i> Address of the instruction where the interrupt occurred. |
| Extra chars in command                                      | Your previous <i>u</i> command had extra, unrecognized characters on the end.                                                                                                                                                                                                   |
| FC <i>n</i> space                                           | The address space being accessed by the monitor's memory reference commands is defined by Function Code number <i>n</i> . This message is printed by the <i>s</i> command.                                                                                                      |
| For phys part <i>p</i> , No label found.                    | The boot program tried to boot from a nonzero <i>physical partition</i> on a disk and could not find a label. Disk drives have both fixed and removable physical partitions.                                                                                                    |
| Give the above information to your service representative.  | The monitor found a hardware problem while executing its power-on, self-test procedure. A preceding line on the system describes the error in more detail.<br><br>Report the problem to your service representative.                                                            |
| Giving up...                                                | See Waiting for disk to spin up.... The monitor <i>gave up</i> and stopped waiting for the disk to become ready.                                                                                                                                                                |

# Messages from the Boot Procedure

---

Table D-1. Messages from the Monitor and Boot Program (cont)

---

| Message                               | Cause                                                                                                                                                                                                                                                                                        |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID PROM INVALID                       | <p>The monitor cannot find a valid ID PROM on the CPU board. The ID PROM contains the machine's serial number and other information specific to your system. If you have recently changed CPU boards, the ID PROM may be installed incorrectly.</p> <p>Call your service representative.</p> |
| ie: cannot initialize                 | <p>The monitor or boot program tried to boot from an Ethernet controller and failed. Your Ethernet board has a serious problem.</p> <p>Call your service representative.</p>                                                                                                                 |
| Invalid Page Bus Error ...            | <p>See Bus Error.... The virtual page containing the addressed data has been designated as invalid. Your program is trying to access an incorrect address.</p> <p>Debug the program.</p>                                                                                                     |
| Invalid selection                     | <p>Your last u command was not correct.</p>                                                                                                                                                                                                                                                  |
| Keyboard error detected               | <p>The microprocessor on the keyboard reported an error. Your keyboard hardware is probably broken and needs to be replaced.</p>                                                                                                                                                             |
| Load: <i>dev(ctrl,unit,part)</i> boot | <p>The monitor has loaded in the <i>mini</i> boot program from a disk drive or network disk. The mini boot is now reading in the <i>real</i> boot program from the disk. The <i>real</i> boot program will then read in the program you requested.</p>                                       |
| Lower Byte Parity Bus Error ...       | <p>See Bus Error... and Parity.... The preceding access was to memory with a parity error in its lower byte.</p>                                                                                                                                                                             |
| Misplaced label on head <i>n</i>      | <p>The monitor or boot program tried to boot from a disk. It has found a label that seems to identify itself as belonging to a different read/write head from the one where the label is written. See also Corrupt label on head message.</p>                                                |
| mt: controller does not initialize    | <p>The monitor tried to boot from a nine-track tape. The tape controller could not complete its initialization sequence. This may indicate a defect in the controller or an incorrect controller configuration.</p>                                                                          |

---

**Table D-1. Messages from the Monitor and Boot Program (cont)**

---

| <b>Message</b>                                       | <b>Cause</b>                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>mt: error 0xxx</code>                          | The monitor tried to boot from a nine-track tape and failed. The error number <code>xx</code> can be decoded by your service representative.                                                                                                                                                                                                                                                                                               |
| <code>mt: unit not ready</code>                      | The monitor tried to boot from a nine-track tape, but the tape drive is not ready. Make sure the drive is on-line.                                                                                                                                                                                                                                                                                                                         |
| <code>nd: no file server, giving up</code>           | The system tried to boot from a network disk server over the Ethernet. There was no response from the server. Check the Ethernet address in the boot command; if it is zero, make sure your machine's Ethernet address is in the server's <code>/etc/nd.local</code> file. If it is, check your Ethernet cable connection, check that the server is running correctly, and/or check whether other machines on the network can communicate. |
| <code>nd: output error 55</code>                     | This message appears after the server not responding message below. The cause is the same.                                                                                                                                                                                                                                                                                                                                                 |
| <code>nd: server not responding</code>               | When there is heavy disk activity from clients and the file server tries to access the disk, some clients will lose access to the disk for a short period of time. When the <code>nd: server ok</code> message appears, client has access again. If the system does not correct itself, you must reboot.                                                                                                                                   |
| <code>No controller at mbio xxxx</code>              | The monitor tried to boot, but it cannot find a device controller where you asked it to look. You should try another boot command, or make sure that your controller board is plugged in and all jumpers and switches are set properly.                                                                                                                                                                                                    |
| <code>No default boot devices</code>                 | The monitor tried to boot but it cannot find a disk or Ethernet interface to boot from. To boot from a tape, you must specify the device name explicitly, as:<br><br><code>&gt;b sd</code>                                                                                                                                                                                                                                                 |
| <code>No label found--attempting boot anyway.</code> | The monitor or boot program tried to boot from a disk and could not find a valid label on the disk. To fix, boot a copy of <code>diag(8S)</code> from a different device (e.g., network disk or tape) and use the <code>verify label</code> and <code>label</code> commands. See the warning under <code>Corrupt label</code> above. This error might also be caused by missing or bad disk cables.                                        |
| <code>No more file slots</code>                      | The current program is using the stand-alone I/O library and has opened too many devices or files.                                                                                                                                                                                                                                                                                                                                         |

# Messages from the Boot Procedure

---

Table D-1. Messages from the Monitor and Boot Program (cont)

---

| Message                                               | Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| not a directory                                       | The current program (possibly the boot program) has tried to open a disk or netdisk file with a path name, but one of the names in the path is not a directory.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| name not found                                        | The boot program searched for the requested file, but could not find it. Retry your boot command using * instead of <i>name</i> to see a list of the names that exist in that directory.                                                                                                                                                                                                                                                                                                                                                                                          |
| null path                                             | The current program (possibly the boot program) tried to open a file without a name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PageMap <i>aaaaaa</i> [ <i>ss</i> ]: <i>xxxxxxx</i> ? | <p>The monitor is displaying or modifying a page map entry because you entered a p command. Where:</p> <p><i>aaaaaa</i> The virtual memory address whose map entry is being examined.</p> <p><i>ss</i> The segment map entry being used to map this page map entry and page.</p> <p><i>xxxxxxx</i> The page map entry itself.</p> <p>You can enter a SPACE and RETURN to get back to command mode.</p>                                                                                                                                                                            |
| Panic: Bus Error                                      | Contact your service representative. You may need a new memory board. See also Bus Error....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Panic: Parity Error...                                | Record the diagnostic messages and contact your service representative.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Parity Bus Error...                                   | See Bus Error.... The attempted access was probably valid, but was canceled because the <i>preceding</i> access was to memory with bad parity. (Parity errors are reported on the memory cycle <i>after</i> the failing cycle.) If neither Upper Byte nor Lower Byte is specified by this message, the parity on both bytes is invalid. The access address printed in the Bus Error message is probably not relevant to the parity error. There is no general way to recover from this error. Try booting <b>parscan(8S)</b> , which will search all of memory for parity errors. |
| Please clear keyboard to begin                        | The monitor tried to listen for your typing on the keyboard, but cannot tell which SHIFT keys are down until you release all the locking keys (CAPS LOCK and SHIFT LOCK). Once it has seen all the keys released, it can then track the movements of the keys and typing will work.                                                                                                                                                                                                                                                                                               |

---

**Table D-1. Messages from the Monitor and Boot Program (cont)**

---

| <b>Message</b>                                                            | <b>Cause</b>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Please start it, if necessary,                                            | -OR- press any key to quit.<br>See Waiting for disk to spin up....                                                                                                                                                                                                                                                                                                                                                                                         |
| Possible boot devices:                                                    | You have asked for a list of boot devices with the <code>b ?</code> command.                                                                                                                                                                                                                                                                                                                                                                               |
| Protection Bus Error ...                                                  | See Bus Error.... The attempted access was invalid because your program is not permitted to access the addressed data in this way (for example, writing to that page is disallowed).                                                                                                                                                                                                                                                                       |
| reboot: can't idle init                                                   | You tried to reboot when you were not superuser. Change to superuser and try again.                                                                                                                                                                                                                                                                                                                                                                        |
| Retensing...                                                              | The monitor tried to boot from an Archive tape. It failed, so it is retensing the tape (winding all the tape from one reel to the other), which makes the boot more likely to succeed.                                                                                                                                                                                                                                                                     |
| ROM Rev <i>x</i> , Serial number <i>ssss</i> , <i>mm</i> memory installed | The monitor is identifying its revision level and the system configuration as part of the power-on sequence.<br><br><i>x</i> A letter or phrase indicating which particular version of the monitor is installed.<br><br><i>ssss</i> Your machine's serial number.<br><br><i>mm</i> Memory found during system configuration at power-on. If an even number of megabytes is installed, <i>mm</i> is displayed as <i>nnMB</i> ; otherwise as <i>nnnnKB</i> . |
| sc0: no cartridge in drive                                                | This message occurs when you try to access the tape drive for the first time after new software installation or after a system reboot.<br><br>The message can be ignored. To use the tape drive simply issue the command again. The message should not recur until another reboot or new software installation.                                                                                                                                            |
| sc0: cartridge is write protected                                         | You are trying to write to a tape that is write-protected.<br><br>Turn the SAFE arrow on the 1/4-inch data cartridge away from SAFE if you wish to write. On a 1/2-inch tape use a write ring.                                                                                                                                                                                                                                                             |



# Messages from the Boot Procedure

---

Table D-1. Messages from the Monitor and Boot Program (cont)

| Message                                               | Cause                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seek not from beginning of file                       | The current program is using the stand-alone I/O library and has tried to do an unsupported seek operation.                                                                                                                                                                                                                                                                       |
| SegMap <i>aaaaaa: xx?</i>                             | The monitor is examining or changing the segment map in response to your recent <i>m</i> command. Enter a space and a RETURN to get back to command mode.                                                                                                                                                                                                                         |
| Self Test completed successfully                      | The monitor has completed its power-on self-test and found no hardware problems.                                                                                                                                                                                                                                                                                                  |
| Self Test found problem in <i>something</i>           | The monitor completed its power-on self-test and found a problem in some subsystem. <i>Something</i> gives the general location of the error. Further messages give more details; see Wrote ... and Damage found....                                                                                                                                                              |
| Serial some number, Ethernet address <i>n:n:n:n:n</i> | The monitor is identifying your machine's serial number and hardware Ethernet address as part of the power-on sequence. The hardware Ethernet address is taken from the ID PROM on the CPU board and is shown as a 6-byte hexadecimal value. A typical Ethernet address might be 8:0:1:1:1:A3.                                                                                    |
| Short read                                            | The boot program tried to boot a program from disk or net disk. It located the program, but encountered an error while reading it into memory.                                                                                                                                                                                                                                    |
| Size: <i>text +data +bss</i> bytes                    | The boot program is loading in the program you requested. <i>Text</i> , <i>data</i> , and <i>bss</i> are the sizes of the three sections of the program; they are printed as each is read into memory. After finishing display of this message, the boot program begins execution of your program; further messages can come from it instead of from the boot program or monitor. |
| st: cartridge is write protected                      | <p>You are trying to write to a tape that is write-protected.</p> <p>Turn the SAFE arrow on the 1/4-inch cartridge away from SAFE if you wish to write. On a 1/2-inch tape use a write ring.</p>                                                                                                                                                                                  |

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**Table D-1. Messages from the Monitor and Boot Program (cont)**

---

| <b>Message</b>                                                            | <b>Cause</b>                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>st: drive not responding</code>                                     | The monitor tried to boot from a tape, but cannot get a response from the tape drive. This can occur if your system contains a controller board, but no tape drive; if the tape drive's cable is loose or disconnected; or if the tape drive's power is not on. |
| <code>st: error 96A0</code>                                               | You have a QIC 11 tape drive and are trying to use QIC 24 software installation tapes.<br><br>Request QIC 11 tapes or upgrade the tape drive to QIC 24 format.                                                                                                  |
| <code>st: error xxxx</code>                                               | The monitor or boot program tried to boot from a tape and encountered a problem. This error could be caused by incorrect cables, a bad tape, or other problems. The status bytes <code>xxxx</code> can be decoded by your service representative.               |
| <code>st: invalid state xx</code>                                         | This message indicates that the stand-alone I/O system has a bug in its driver.                                                                                                                                                                                 |
| <code>st: no cartridge in drive</code>                                    | The monitor or boot program tried to boot from a tape, but there is no cartridge in the tape drive.                                                                                                                                                             |
| <code>st: no drive</code>                                                 | The monitor or boot program tried to boot from a tape, but the specified drive does not exist. Typical Archive configurations only include drive 0.                                                                                                             |
| <code>st: RDST gave Exception, retrying</code>                            | The current program tried to use the tape drive and encountered an error. The error is probably caused by hardware. Check the cable(s) that connect the tape drive to the system.                                                                               |
| <code>st: triggered at idle xx</code>                                     | The stand-alone I/O system has a bug in its driver.                                                                                                                                                                                                             |
| <code>stintr:sense 96a0&lt;WriteProt,HardErr,WrongBlock,NoData&gt;</code> | You are trying to read a tape that either has no data on it or you are trying to read past the existing data.<br><br>Press CTRL-C to kill the tape process.                                                                                                     |

# Messages from the Boot Procedure

---

Table D-1. Messages from the Monitor and Boot Program (cont)

| Message                                                                                                                        | Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>tar: cannot open /dev/rst0</code>                                                                                        | <p>There are two possible reasons for this message. If you are trying to write to a tape, then the tape is write-protected.</p> <p>Turn the SAFE arrow on the 1/4-inch cartridge away from SAFE if you wish to write. On a 1/2-inch tape use a write ring.</p> <p>This message can also occur when you try to access the tape drive for the first time after new software installation or after a system reboot.</p> <p>At this time the message can be ignored. To use the tape drive simply issue the command again. The message should not recur until another reboot or new software installation.</p> |
| <code>tar: tape read error</code>                                                                                              | <p>There is more than a single possible cause: You are trying to read a tape that has no data on it or you are trying to read past the existing data. You may be trying to read a QIC 24 tape on a QIC 11 tape drive (or vice versa). Obtain a compatibly-formatted tape. Your software tape could be damaged; if you suspect this, contact your service representative.</p> <p>Press CTRL-C to kill the tape process.</p>                                                                                                                                                                                 |
| <code>Timeout Bus Error ...</code>                                                                                             | <p>See <code>Bus Error...</code>. The attempted access failed because no device responded at the addressed location. This most often happens for multibus references. The program was probably trying to access a device or section of memory that does not exist, or that has <i>hung</i>. If this occurs in response to a boot command, the device you are trying to boot from is not installed in your system.</p>                                                                                                                                                                                      |
| <code>tm: error nn during config of ctlr cc</code><br><code>tm hard err nn</code><br><code>tm: no response from ctlr cc</code> | <p>A stand-alone program (possibly the boot program) tried to use the Tapemaster nine-track drive, and has encountered an error. This message might also read <code>tm: error nn during config ctlr cc</code> or <code>tm: hard err nn</code>. This problem could be caused by a bad or missing tape, loose or misplugged cables, incorrect jumpers on the Tapemaster controller board, or hardware errors. <i>nn</i> can be decoded by your service representative.</p>                                                                                                                                   |
| <code>Unknown device</code>                                                                                                    | <p>The current program (possibly the boot program) has tried to use a device unknown to the stand-alone I/O system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>Upper Byte Parity Bus Error ...</code>                                                                                   | <p>See <code>Bus Error...</code> and <code>Parity...</code>. The preceding access was to memory with a parity error in its upper byte.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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**Table D-1. Messages from the Monitor and Boot Program (cont)**

---

| <b>Message</b>                                     | <b>Cause</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>ui i, uoo, uaabaud, ubbbaud, uaaaaaa, uecho</i> | <p>The monitor is describing its console and serial port configuration in response to a <b>u</b> command. Where:</p> <p><i>i</i> Input device (k for keyboard, or a or b for a serial port).</p> <p><i>o</i> Output device (s for screen, or a or b).</p> <p><i>abaud</i> Baud rate on the serial ports.</p> <p><i>bbaud</i> Baud rate on the serial ports.</p> <p><i>aaaaaa</i> Address of the Zilog 8530 chip (implements the serial ports).</p> <p><i>echo</i> e if input echoing is enabled (full-duplex) or ne if disabled (half-duplex).</p>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Using RS232 A input                                | <p>The monitor did not find the keyboard, so it is taking input from one of the serial ports on the back of the workstation, marked RS-232-A or SIO-A. If this is unexpected, make sure that the keyboard is plugged into the correct socket on the workstation. The keyboard must be plugged in before system power is turned on. If you connect a keyboard after this message appears, you can let the monitor know about the keyboard by entering the Abort sequence (hold down the L1 key and press A). The monitor will switch to using the new keyboard since that is where the Abort was typed. Then type <b>c</b> to continue whatever program was running when you aborted.</p> <p>You can connect any normal ASCII terminal to the RS-232-A connector on the back panel. Configure the terminal for 9600 baud, no parity, one stop bit. Text you type on the terminal is displayed on the video screen, if you have one, or on the terminal's screen.</p> |
| Waiting for disk to spin up...                     | <p>The monitor tried to boot from a disk. The disk is not ready, so the monitor is waiting in the hope that the disk is just starting to spin and will become ready soon. If you get this message when the power has been on for a while, your disk cables are probably loose or misconnected.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Watchdog reset!                                    | <p>The current program has stopped executing with a double bus fault. The two most common causes are that low memory (interrupt vectors) has been overwritten, or the system stack pointer is pointing to an invalid address. There is a serious bug in your program if this occurs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| What?                                              | <p>You typed a command that the monitor does not recognize. Try again.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

# Messages from the Boot Procedure

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Table D-1. Messages from the Monitor and Boot Program (cont)

---

| Message                                                                                                                      | Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wrote <i>wdata</i> at address <i>addr</i> , but read <i>rdata</i>                                                            | <p>The monitor has completed its power-on self-test and found a problem in some subsystem. The preceding Self Test found a problem... message describes which part of the system was in error. This message gives more details about the error.</p> <p><i>wdata</i> Data that was written into part of the system or which was expected to be there if the system was functioning normally.</p> <p><i>addr</i> Address where the data was read and/or written. For memory errors, this is a physical memory address; for other errors, the interpretation of this field depends on what subsystem was being tested.</p> <p><i>rdata</i> Data that was read back from <i>addr</i> and was found to be invalid because it was not the same as <i>wdata</i>.</p> <p>This information should be written down and reported to your service representative.</p> |
| <i>xy</i> : init error <i>xx</i><br><i>xy</i> : error <i>nn</i> cmd <i>xx</i><br><i>xy</i> : error <i>nn</i> bno <i>bbbb</i> | <p>The monitor tried to boot from the Type A (or B) disk and failed. The command being executed at the time is named by the hexadecimal value <i>xx</i> (if present); the block number by <i>bbbb</i> (if present), and the particular error by <i>nn</i>. These codes can be decoded by your service representative.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>xy</i> : no bad block info                                                                                                | <p>The boot program tried to read from the Type A (or B) disk, but cannot find the information about bad blocks on the disk. It continues, but if the program attempts to read any bad blocks (that were remapped to a new location on the disk), the attempt will fail.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| zero length directory                                                                                                        | <p>A stand-alone program (possibly the boot program) tried to read a file from disk, but one of the directories in the path name has no files in it. The file system should be checked and fixed by using <code>fsck(8)</code>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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# Handling Reported Disk Flaws and Formatting Disks

---

# E

This appendix shows you how to

- Handle system-reported disk flaws
- Format your disks using the formatting function of the **prepdisk** utility

If you have a disk that reports disk errors, you should follow the procedures in the subsection Handling System-reported Disk Flaws. These procedures identify the bad sectors on your disk to the system and the software stops using these sectors. If the disk continues to have disk error problems, you can choose to reformat the disk, deleting all data on the disk and completely real-locating memory space. Procedures to reformat a disk are in the subsection Reformatting Your Disk with **prepdisk**.

---

## NOTE

To handle disk flaws and format SMD disk types R, S, V, W, and X, you use the **slip** command, discussed in several places in this section. A SMD disk type of R, S, V, W, or X that was formatted with a previous version of **prepdisk** does not yet have a slip sector list. When you first use the **slip** or the **format** commands on one of these disks, you see the message:

```
Warning: Unable to read slip sector list from disk. Creating
slip sector list by reading headers...
```

It takes 15 to 20 minutes for **prepdisk** to read the slip sector list. Any subsequent use of the **slip** or **format** commands on this disk produces the following message:

```
Reading the slipped sector list from the disk.
OK. Slip List successfully read
```

---

## Handling System-Reported Disk Flaws

---

This subsection tells you what to do if your system has reported disk flaws. First, follow procedures for all disk types. Then follow instructions for your specific type of disk:

- C, E, and I (Nonembedded SCSI Adaptec Controller: 50MB and 85MB disks)
- J, K, L, N, and O (Embedded SCSI Controller: 170MB and 380MB disks)
- A, B, Y, and Z (Xylogic Controller: 300MB and 515MB disks)
- R, S, V, W, and X (Xylogic Controller: 515MB and 1GB disks)

# Handling Reported Disk Flaws and Formatting Disks

---

## Procedures for Disk Flaws for All Disk Types

---

Follow these procedures for all disk types. Then continue with the procedure that applies to your type of disk.

1. A bad sector is reported by the UNIX operating system on your screen and is stored in `/usr/adm/messages`. This report gives the partition designation, a block offset number, and an absolute address. Copy these three numbers. For example, the following appears on your screen:

```
xy1g: read retry (unrecoverable data error) blk 7936 abs
89336
```

Copy `xy1g`, `blk 7936`, and `abs 89336`.

2. Boot stand-alone `prepdisk` from your UNIX tape or disk, or from across the Ethernet. (If you do not know how to do this, see the Booting from `prepdisk` subsection in Section 2 of this manual.)
3. A menu appears. Select the Automatic mode. The system displays a list of your disks, their types and sizes.
4. Select the disk unit that has the bad sector.
5. To make sure that you are working with the correct disk, issue a `verify` command at the `PREPDISK_AUTO>` prompt.
6. Issue a `read` command at the `PREPDISK_AUTO>` prompt. The `read` command prompts you for information. To get the *starting-address-of-error*, subtract 20 from the absolute number you copied in step 1. The number of blocks is always 40; the increment is always 1; and the number of blocks per transfer is always 1.

```
starting block ? starting-address-of-error
of blocks ? 40
increment ? 1
of blocks per transfer ? 1
```

If `prepdisk` reports an error, look for the error printout line. It looks similar to the following:

```
>>READ<< error cyl=123, head=4, sector=5
```

Copy the cylinder, head, and sector numbers on paper.

You must restrict this area of your disk from being used. Procedures to do this are specific for your disk type. Follow the instructions in one of the following subsections:

- Procedures for Disk Flaws for C, E, and I (50 and 85MB disks)
- Procedures for Disk Flaws for J, K, L, N, and O (170MB and 380MB disks)
- Procedures for Disk Flaws for A, B, Y, and Z (300MB and 515MB disks)
- Procedures for Disk Flaws for R, S, V, W, and X (515MB and 1GB disks)

---

## Procedures for C, E, and I (50MB and 85MB) Disks

---

**NOTE** To handle disk flaws on disks C, E, and I, you issue the **FORMAT** command as part of the procedure. This destroys all data on your disks. Make backup tapes before you begin. (See the *CADDStation Systems Manager Guide* if you need more information.) The **FORMAT** command is not necessary to handle disk flaws on any other type of disk.

---

Follow these steps for disk types C, E, and I to restrict system use of bad areas of your disk.

1. At the **PREPDISK\_AUTO** prompt, enter the **FOrmat** command. The prompt changes to **PREPDISK\_AUTO/FORMAT**. Or use the **FOrmat** command in the Automatic Mode Formatting Menu.

2. Enter the **TRAnslate** command. The system prompts you for cylinder, head, and sectors, as follows

```
Enter Sector to translate in cyl/head/sec or block,
^C to quit ?
```

3. Enter the **cyl/head/sector** numbers you wrote down in step 6 of Procedures for Disk Flaws for All Disk Types. If the **TRAnslate** is successful, **prepdisk** displays the following. Copy these numbers and type **^C** (**CTRL-C**) when done.

```
cyl 123 head 4 bfi 1234 (physical)
```

4. Enter the **ADd** command to add the flaw into the **prepdisk** flaw map retrieved from disk.

5. Enter the **PMap** command to make sure the entry was added.

6. Execute a **FOrmat** command to reformat the entire disk.

7. Do a **SURana** command to analyze the surface of the disk. This takes about 30 minutes.

8. If **prepdisk** reports more errors at the end of the **SURana** command sequence, repeat the **FOrmat** command. Repeat steps 4 and 5 until you receive no errors from the **SURana** command.

9. Enter **q** to quit the **FOrmat** command and return to the **PREPDISK\_AUTO** prompt. The Automatic Mode Formatting Menu appears.

```
Automatic Mode Formatting Menu:
```

- 1 - Format
- 2 - Partition & Label
- 3 - Change Disk
- 4 - Exit to PREPDISK\_AUTO

```
Please enter your selection or type "?" for help <CR=4>
```



# Handling Reported Disk Flaws and Formatting Disks

10. Select 2 to partition and label your disks. The Partition Sub-commands menu appears, and the prompt changes to PREPDISK\_AUTO/PARTITION:

PARTITION Sub-commands menu:

```
Quit - Quit the Partition command
Help - Print out this menu, additional help if
 requested
RP - Recover Partition table from disk
DP - Default Partition table
CP - Current Partition table in memory
LA - Label the Disk
```

PREPDISK\_AUTO/PARTITION>

11. Enter **dp** for the default partition table. The system prompts  
Do you wish to use a primary or secondary partition map (P/S)? <CR=P>
12. To work on the first disk, enter **p** or press RETURN to select the primary partition map. To select the secondary partition map, enter **s**. The system prompts  
Do you wish to use a Fileserver partition map (Y/N)? <CR=Y>
13. If you plan to serve clients from your current system, enter **y** or RETURN for yes. If not, enter **n** for no. The system displays the partition table for your disk. The system fills in the number of megabytes in each partition. On systems with clients, empty partitions are listed with a size of 0.00. On systems without clients, the screen displays only the partitions in use.

If your system serves clients, the screen displays

```
Default partition table for 'disk type __'
Partition Starting Cylinder Sectors Cylinders Mbytes
a 15.00
b 16.00
c _____.__
d _____.__
e _____.__
f _____.__
g _____.__
```

If your system does not serve clients, the screen displays

```
Default partition table for 'disk type __'
Partition StartingCylinder Sectors Cylinders Mbytes
a 9.00
b 16.00
c _____.__
g _____.__
```

---

14. The screen prompts

Do you wish to modify this table (N/Y) ? <CR=N> n

You do not usually need to modify the table. Enter n or RETURN for no. In setup, described in Section 4, you configure your disks for specific client partitioning.

The system displays a message and a prompt after it initializes the disk:

Use the label command to write out the partition table.  
PREPDISK\_AUTO/PARTITION> la

15. Enter la to label the disk. The system asks you to confirm this.

Are you sure you want to label the disk (Y/N) <CR=N> y

16. Enter y for yes. The system displays messages and the PREPDISK/PARTITION> prompt.

Writing primary label to disk . . ok  
Writing backup labels to disk . . ok

PREPDISK\_AUTO/PARTITION> rp

17. Enter the rp command. The screen displays all the actual partitions and their sizes. If a partition is empty, it is not displayed.

18. You have finished partitioning and labeling this disk. Enter q to return to the Automatic Mode Formatting menu. The screen displays

Automatic Mode Formatting Menu:

- 1 - Format
- 2 - Partition & Label
- 3 - Change Disk
- 4 - Exit to PREPDISK\_AUTO

Please enter your selection or type "?" for help <CR=4>  
RETURN

19. Enter a RETURN to exit. The PREPDISK\_AUTO> prompt appears. Enter q to quit prepdisk.

PREPDISK\_AUTO> q

20. Now reload your software following instructions in Section 4.

# Handling Reported Disk Flaws and Formatting Disks

## Procedures for J, K, L, N, and O (170MB and 380MB) Disks

Follow these steps for disk types J, K, L, N, and O to restrict use of bad areas of your disks:

1. From the PREPDISK\_AUTO prompt, issue a FOrmat command. The prompt changes to PREPDISK\_AUTO/FORMAT.
2. Issue an MSector command using the cyl/head/sec number, which you wrote down, that was issued by the TRanslate command.

If the command displays no errors, the sector has been mapped; however, the data on the sector may or may not be corrupted. If the MSector command reports an error, the alternate sector may also be bad. If this occurs, repeat the MSector command using the same cyl/head/sec number. If you are not successful after three times, stop mapping and have the system checked out as soon as possible.

3. Issue the PGIst (Print Growth defect list) command to make sure that the sector has been mapped. Because this list uses physical sector addressing, the disk address may not be the same as the one you entered. However, an additional entry should appear in the list for each cyl/head/sec you entered using the MSector command.

Relabeling is not required for these disks.

---

## Procedures for A, B, Y, and Z (300MB and 515MB) Disks

Follow these steps for disks A, B, Y and Z to restrict use of disk areas:

---

### NOTE

If you have more than 126 flaws to map on a disk type Y or Z, change the disk's geometry to disk types R and S respectively by reformatting the disk. Disk types R and S can handle more than 126 flaws using the slip command. See Changing Disk Types Y or Z to Disk Types R or S and Procedures for Disk Flaws for R, S, V, W, and X (515MB and 1GB Disks).

---

1. Issue a Map command at the PREPDISK\_AUTO prompt. prepdisk displays the flaw map. Respond to the prompts as shown in this example:

```
PREPDISK_AUTO > map
Reading the CV flaw map from disk..
OK... Flaw map successfully read.
This is the current combined CV Flaw map (page 1 of 1):
sector 283/ 1/66 mapped to 1736/13/65
sector 302/ 0/55 mapped to 1736/13/64
sector 380/10/37 mapped to 1736/13/63
sector 403/10/37 mapped to 1736/13/62
2 operator entered flaws; 3 surface analysis flaws;
0 alternate cylinder flaws; 0 vendor flaws
Total number of bad sectors = 5.
Do you wish to add a bad sector ? (Y/N) ? <CR=Y> RETURN
Mapping can be removed only by a qualified field service
representative and a complete format of the disk.
Will you be entering by logical sectors?
answer 'L' for logical sectors - or -
answer 'B' for bytes from index-bfi-(L/B)?<CR=L> RETURN
Enter Cylinder to be mapped ? 260
Enter Head to be mapped ? 11
Enter Logical Sector to be mapped ? 30
Attempt to preserve data?(Y/N) ? <CR=Y> RETURN
Data transfer successful.
OK to map sector 260/11/30?(Y/N) ? <CR=Y> RETURN
Checking map to avoid duplicate flaw entry...
Reading the CV flaw map from disk..
OK... Flaw map successfully read.
OK.. no duplicate found.
Mapping sector 260/11/30 to alternate sector 1736/13/61.
Writing CV Flaw Map to disk..ok
Do you wish to add a bad sector ? (Y/N) ? <CR=Y> y
```

2. Answer y to this question until you have entered all flaws, one at a time. After you add all flaws, answer n to this question.

```
Do you wish to add a bad sector ? (Y/N) ? <CR=Y> n
```

prepdisk returns you to the PREPDISK\_AUTO> prompt. Enter the map command to see all mapped sectors. Relabeling is not required because you did not issue the FOrmat command.

```
PREPDISK_AUTO > map
```

# Handling Reported Disk Flaws and Formatting Disks

## Procedures for R, S, V, W, and X (515MB and 1GB) Disks

If you are working on a 515MB or 1GB disk, type R, S, V, W, or X, you use the `slip` command on all flaws. If the `slip` command does not succeed on some flaws, then you use the `map` command on these. (If you are working on a 515MB disk, type Y or Z, you use the `map` command for all your flaws.)

The `map` command has a limit of 126 flaws. Flaws that are slipped do not show in the flaw map and therefore do not take up part of the 126 flaws permitted in the flaw map. This permits the disk to handle a much higher number of flaws as is necessary for large storage disks.

The following is an example showing the use of the `slip` command to slip flaws on disk types R, S, V, W, and X. In the first example, the flaws are entered using `bfi` (bytes-from-index) for the sector location. In the second example, the flaws are entered using logical sectors.

You cannot use the `slip` command on the following:

- Any vendor flaws which occur on the last sector of a track, since these sectors are marked as spares by the format process. A message is displayed: Your `bfi` entry of `nn` converts to an unusable sector `nn/nn`. Use the `map` command.
- Any sector that has a mapped sector in a sector preceding the spare sector since this would invalidate the mapped sector.
- Any disks whose geometry does not incorporate a slip sector per track (such as disk types Y and Z).

1. Enter the disk number that you want to slip flaws on at the `prepdisk` disk list.

```
CADDStation Prepdisk Disk Initialization and Diagnostic
Rev-3.18 08/12/88. Copyright (c) <1986> by Computervision
Corporation as an unpublished work. All rights reserved.
```

```
Enter "A" to select automatic mode or
 "M" to select manual mode (A/Ma) ? <CR=A> RETURN
```

```
Disk Sizing, please wait for about 1 minute ...
```

```
0 - xyc0 drivetype 3/unit 0
 disk type W - 1GB/851MB cyl 1735 alt 2 hd 15 sec 67
1 - xyc0 drivetype 0/unit 0
 disk type A - 300MB/243MB cyl 820 alt 3 hd 19 sec 32
2 - Manual entry
```

```
Select a disk or type "?" for help <CR=0> ? RETURN
```

```
Performing Initialization on selected Disk type :
Controller status : 9 |Adr_24b|Drive_Rdy|
Drive status : |ready|
Controller PROM Rev-2-A, controller read vendor flaw list
capability.
Controller set to the following geometry:
1735 cylinders, 2 alt cylinders, 15 heads, 67 sectors
interleave 1 drive type 3
```

---

2. Select 4 to Exit to PREPDISK\_AUTO.

Automatic Mode Formatting Menu :

- 1 - Format
- 2 - Partition & Label
- 3 - Change Disk
- 4 - Exit to PREPDISK\_AUTO

Please enter your selection or type "?" for help <CR=4> 4

3. Enter the slip command. Answer the prompts.

```
PREPDISK_AUTO > slip
Reading the slipped sector list from the disk.
OK. Slip List successfully read
```

This is a list of the slipped sectors currently on the disk (page 1 of 1):

- 1) sector 116/ 3/23 slipped
- 2) sector 177/18/25 slipped
- 3) sector 331/ 2/ 9 slipped
- 4) sector 392/ 7/28 slipped
- 5) sector 424/18/10 slipped

Do you wish to slip a bad sector? (Y/N) ? <CR=Y> RETURN  
slipping may be removed only by complete format of the disk

```
Will you be entering by logical sectors?
answer 'L' for logical sectors - or -
answer 'B' for bytes from index -bfi-(L/B) ? <CR=L> b
Cylinder number ? 50
Head number ? 10
Enter decimal Bytes from Index (bfi) ? 12345
Your bfi entry of 12345 converts to logical sector 50/10/10
Reading the CV flaw map from disk..
OK... Flaw map successfully read.
Attempt to preserve data ?(Y/N) ? <CR=Y> RETURN
OK to attempt slip ?(Y/N) ? <CR=Y> RETURN
Slip of 50/10/10 successful
Data transfer successful
Do you wish to slip a bad sector ? (Y/N) ? <CR=Y> y
slipping may be removed only by complete format of the
disk
```

This shows a successful slip. (Note that you may enter flaws by logical sector, if you have flaws shown by logical sectors.)

4. This example shows an unsuccessful slip. Mark this flaw on your list. You will use the map command on it later.

```
Will you be entering by logical sectors?
answer 'L' for logical sectors - or -
answer 'B' for bytes from index -bfi-(L/B) ? <CR=L> b
```

# Handling Reported Disk Flaws and Formatting Disks

```
Cylinder number ? 123
Head number ? 4
Enter decimal Bytes from Index (bfi) ? 5000
Your bfi entry of 5000 converts to logical sector 123/4/4
Reading the CV flaw map from disk..
OK... Flaw map successfully read.
Attempt to preserve data ?(Y/N) ? <CR=Y> RETURN
OK to attempt slip ?(Y/N) ? <CR=Y> RETURN
Slip of 555/15/40 failed. Use the Map command
Do you wish to slip a bad sector ? (Y/N) ? <CR=Y> y
```

Answer y to this question until you have entered all flaws, one at a time.  
After you add all flaws answer n to this question and enter q to quit.

```
Do you wish to slip a bad sector ? (Y/N) ? <CR=Y> y
```

5. Any flaws that were not successfully slipped should be mapped with the map command. The next example shows how to map a flaw.

```
PREPDISK_AUTO> map
Reading the CV flaw map from disk..
OK... Flaw map successfully read.
0 operator entered flaws; 0 surface analysis flaws;
0 alternate cylinder flaws; 0 vendor flaws
Total number of bad sectors = 0.
The Flaw Map is empty.
Do you wish to add a bad sector ? (Y/N) ? <CR=Y> RETURN
Mapping can be removed only by a qualified field service
representative and a complete format of the disk.

Will you be entering by logical sectors?
answer 'L' for logical sectors - or -
answer 'B' for bytes from index -bfi-(L/B) ? <CR=L> b
Enter Cylinder to be mapped ? 555
Enter Head to be mapped ? 15
Enter Logical Sector to be mapped ? 40
Attempt to preserve data ?(Y/N) ? <CR=Y> RETURN
Data transfer successful.
OK to map sector 555/15/40 ?(Y/N) ? <CR=Y> RETURN
Checking map to avoid duplicate flaw entry...
Reading the CV flaw map from disk..
OK... Flaw map successfully read.
OK.. no duplicate found.
Mapping sector 555/15/40 to alternate sector 759/17/54.
Writing CV Flaw Map to disk..ok
Do you wish to add a bad sector ? (Y/N) ? <CR=Y> n
PREPDISK_AUTO> map
```

Enter the map command to see all newly mapped flaws. Relabeling is not required because you did not issue the FOrmat command.

---

## Formatting Your Disk with prepdisk

---

If you have followed the previous procedures in Handling System-reported Disk Flaws and you continue to get disk errors, you may want to reformat your disk. This subsection tells you how to use **prepdisk** to format a disk.

To reformat your disk, make backup tapes for your disks. The **FORMAT** command destroys all data on the disk. Load UNIX Tape #1 and boot the **prepdisk** program. Select the formatting procedure based on the type of disks your system has, and run surface analysis passes on the disk. Surface analysis takes about 30 minutes per pass (45 minutes for 1GB disks). You should run five surface analysis passes on each disk. Because of the time required, you may want to run the surface analysis phase during the night and finish the installation procedures the next day.

---

**NOTE** For disk controller problems, contact your field service representative.

---

Do the following to enter the **prepdisk** utility: (See Sections 1 and 2 if you are booting **prepdisk** on a tapeless system.)

1. Execute the command **/etc/halt**—if you are on a server, halt all clients first.
2. Enter the following:  
If you are booting from a 1/4-inch tape:  
**>b st( )**  
If you are booting from a 1/2-inch tape:  
**>b mt( )**
3. For a 1/4-inch tape drive, the system prompts **Boot: st(0,0,0)**. Enter the following:  
**Boot: st(0,0,3)**  
For a 1/2-inch tape drive, the system prompts **Boot: mt(0,0,0)**. Enter the following:  
**Boot: mt(0,0,3)**

Select automatic mode. The system displays a list of your disks. Go to one of the following subsections as appropriate for the type of disk you want to format:

- Formatting nonembedded SCSI disks (types C, E, and I, Nonembedded SCSI Adaptec Controller, 50MB and 85MB disks)
- Formatting embedded SCSI disks (types J, K, L, N, and O, Embedded SCSI Controller, 170MB and 380MB disks)
- Formatting SMD disks (types A, B, R, S, V, W, X, Y, and Z, Xylogic Controller, 300MB, 515MB, or 1GB disks)



# Handling Reported Disk Flaws and Formatting Disks

---

## Formatting Nonembedded SCSI Disks

Use these procedures to format nonembedded SCSI disks types C, E, and I (50MB and 85MB):

1. The system displays a list of your disks, their types and sizes. A prompt asks you to select a disk. For example

```
Disk Sizing, please wait for about 1 minute...
```

```
0 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
1 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
2 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
3 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
4 - Manual entry
```

```
Select a disk or type "?" for help <CR=0> ?
```

2. Select the disk you want to reformat: enter 0 to work on your primary disk, or enter 1 to work on your secondary disk, and so on. The system displays the message Performing Initialization on selected Disk type: followed by messages about the disk you selected. Then the Automatic Mode Formatting Menu appears.

```
Automatic Mode Formatting Menu:
```

```
1 - Format
2 - Partition & Label
3 - Change Disk
4 - Exit to PREPDISK_AUTO
```

```
Please enter your selection or type "?" for help <CR=4>
```

3. Select 1 to format your disk. The following list of subcommands appears. The prompt changes to PREPDISK\_AUTO/FORMAT>.

```
PREPDISK/FORMAT Sub-Commands:
```

```
Quit - quit the FORMAT command.
Help - print out this menu additional help if requested
READ and PRINT DEFECT LIST
RMap - read the Flaw Map from disk.
PMap - print out the current Flaw Map in memory.
EDIT DEFECT LIST
Add - add one entry to the current Flaw Map.
Delete - delete one entry to the current Flaw Map.
Clear - clear the current Flaw Map in memory.
FORMAT RELATED
Format - format the disk using the current Flaw Map.
Surana - surface analyze the disk.
Translate - translate cyl/head/sec to cyl/head/bfi.
SECTOR MAPPING
MSector - map out 1 bad sector.
```

---

**prepdisk** reads the flaw map from the disk and gives the message **Reading Flaw Map . . ok**. If the read flaw map fails and you see the message **READ ERRORS**, the flaw map is missing from your system. Do the following:

- a. Find the printed defect list that was shipped with the drive. It may be in with the shipping materials or inside the drive housing itself.
- b. Issue this command to translate **cyl/head/sec** to **cyl/head/bfi**:  

```
PREPDISK_AUTO/FORMAT> TR
```
- c. Make a table with three headers: **cyl**, **head**, and **sector**. Enter all flaws on this table, according to length, with the longest first.
- d. You must enter each flaw, beginning with the largest number of bits in error. For each flaw, issue the **ADd** command, and put one defect onto your disk flaw map. Repeat this until you have entered all the flaws from the manufacturer's list.
- e. Use the **FOrmat** command to map all known flaws onto your disk flaw map.
- f. Use the **SUrana** command to find all defective areas of your disk and to read them into your system memory.
- g. Partition and label the disk according to the procedures documented in Section 2.

4. If the flaw map is ok, issue this command to print the current flaw map:

```
PREPDISK_AUTO/FORMAT> PM
```

5. Issue this command:

```
PREPDISK_AUTO/FORMAT> FO
```

6. Issue this command to conduct a surface analysis of the disk:

```
PREPDISK_AUTO/FORMAT> SU
```

The system then asks for the number of surface analysis passes. There are five types of data patterns to be read. Respond as shown:

```
of surface analysis passes? 5
```

If the command finds flaws, it adds them to the current list (if they are not already on the list).

7. Repeat the **FO** and the **SU** commands until no new flaws are found. (Usually repeating the surface analysis passes a single time is enough.)

# Handling Reported Disk Flaws and Formatting Disks

## Formatting Embedded SCSI Disks

Use these procedures to format embedded SCSI disks types J, K, L, N, and O (170MB and 380MB).

1. The system displays a list of your disks, their types and sizes. A prompt asks you to select a disk. For example

```
Disk Sizing, please wait for about 1 minute...
```

```
0 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
1 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
2 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
3 - target #nn/unit #nn
 disk type __ cyl nnn alt nn hd nn sec nn
4 - Manual entry
```

```
Select a disk or type "?" for help <CR=0> ?
```

2. Select the disk you want to reformat: enter 0 to work on your primary disk, or enter 1 to work on your secondary disk, and so on. The system displays the message Performing Initialization on selected Disk type: followed by messages about the disk you selected. Then the Automatic Mode Formatting Menu appears.

```
Automatic Mode Formatting Menu:
```

```
1 - Format
2 - Partition & Label
3 - Change Disk
4 - Exit to PREPDISK_AUTO
```

```
Please enter your selection or type "?" for help <CR=4>
```

3. Select 1 to format your disk. The following list of subcommands appears. The prompt changes to PREPDISK\_AUTO/FORMAT>.

```
SCSI Format Sub-Commands:
```

```
Quit - quit the FORMAT Command.
```

```
Help - print out this menu additional help if requested
```

```
READ and PRINT DEFECT LIST
```

```
RLists - read the Primary G-list and P-list from disk.
```

```
PGlist - print out the current G-list in memory.
```

```
PPlist - print out the current P-list in memory.
```

```
PFlaw - print out the surface analysis flaws in memory.
```

```
FORMAT RELATED
```

```
FFormat - format the disk using the current G-list.
```

```
SURana - surface analyze the disk.
```

```
FSurana - format then surface analyze the disk.
```

```
MFlaw - map out new flaws discovered during surface analysis.
```

```
SECTOR MAPPING
```

```
MSector - map out 1 bad sector.
```

To complete this procedure, you may need a copy of the defect list that comes with your system. Field Service can supply this list. Photocopy it and keep it with this manual.

- 
4. Issue this to read the system's growth (G-list) and primary lists (P-list).

PREPDISK\_AUTO/FORMAT> RL

If you do not receive the message READ ERRORS, go to step 6.

If you receive the message READ ERRORS, the flaw map is missing from your system. Do the following to manually enter the map:

- h. Issue the FS command to format the disk and do surface analysis.
  - i. Find the printed defect list that was shipped with the drive. It may be in with the shipping materials or inside the drive housing itself.
  - j. You must enter each flaw. For each flaw, issue the MSector command, and put one defect onto your disk flaw map. Repeat this until you have entered all the flaws from the manufacturer's list.
  - k. Partition and label the disk according to the procedures documented in Section 2. Then return to this section.
5. Issue this command to print out the disk flaws your system knows about (P-list):

PREPDISK\_AUTO/FORMAT> PP

6. Issue this command. This formats your disk and conducts a surface analysis:

PREPDISK\_AUTO/FORMAT> FS

7. Issue this command to print the flaws logged during the surface analysis:

PREPDISK\_AUTO/FORMAT> PF

8. Issue this command to map any flaws found during surface analysis that were not already on the flaw map:

PREPDISK\_AUTO/FORMAT> MF

9. Enter q to quit the format command. The system displays the Automatic Mode Formatting menu. Select 2 to partition and label your disk. Details of the partitioning and labeling procedure are found in Section 2 of this manual.

# Handling Reported Disk Flaws and Formatting Disks

---

## Formatting SMD Disks

You must format an SMD disk in the following cases:

- If you have many disk errors or suspect data is being lost on a running disk
- If you have both a disk type V and a disk type A on the same controller
- If you have both a disk type W and a disk type X on the same controller
- If a flaw map on a disk Y is full; change it to a disk type R
- If a flaw map on a disk Z is full; change it to a disk type S
- If you have both a disk type Y and a disk type R on the same controller
- If you have both a disk type Z and a disk type S on the same controller

Below are procedures for formatting SMD disks types A, B, R, S, V, W, X, Y, and Z (300MB, 515MB, and 1GB) if your disk has been reporting errors. If the flaw map for the disk has been lost, then you will continue with the subsection Reentering the Flaw Map on SMD Disks, where you enter the flaw map using the map or the slip commands.

1. The system displays a list of your disks, their types and sizes. Large disks (on SMD drives) display drivetype #nn, instead of the target #nn shown for SCSI disks. A prompt asks you to select a disk. For example

Disk Sizing, please wait for about 1 minute...

```
0 -xyc0 drivetype #nn/unit #nn
 disk type _ cyl nnn alt nn hd nn sec nn
1 - xyc# drivetype #nn/unit #nn
 disk type cyl nnn alt nn hd nn sec nn <Embedded SCSI>
2 - xyc# drivetype #nn/unit #nn
 disk type cyl nnn alt nn hd nn sec nn <Embedded SCSI>
3 - xyc# drivetype #nn/unit #nn
 disk type cyl nnn alt nn hd nn sec nn
4 - Manual entry
```

Select a disk or type "?" for help <CR=0> ?

2. Select the disk you want to reformat. The system displays the message Performing Initialization on selected Disk type: followed by messages about the disk you selected. Then the Automatic Mode Formatting Menu appears.

Automatic Mode Formatting Menu:

```
1 - Format
2 - Partition & Label
3 - Change Disk
4 - Exit to PREPDISK_AUTO
```

Please enter your selection or type "?" for help <CR=4>

3. Select 1 to format your disk. The system displays a warning, then asks you to confirm that you want to format. Respond to prompts as shown.

DISK FORMAT -- DESTROYS ALL DISK DATA! -- Backup all data before continuing.

The Format command destroys data on the selected disk.  
Do you want to continue(Y/N) ? <CR=N> y

---

Do you want to specify a drive type different from the default for your chosen disk type(N/Y) ? <CR=N> n

Checking current drive type...ok

The disk is presently formatted to be a drivetype 2 which matches the default drivetype for a disk type R.

How many surface analysis passes <CR=5> ? RETURN

Do you want to see the cylinder#/head# displayed as the disk is being formatted(N/Y) ? <CR=Y> n

Reading the CV flaw map from disk..

OK... Flaw map successfully read.

Reading CV's copy of the Vendor Flaw Map from disk..ok(0 entries)(rev-1)

Reading the slipped sector list from the disk.

OK. Slip List successfully read

Changing to the new drive type of 2.

Re-Initializing disk...ok

Controller status : 9 |Adr\_24b|Drive\_Rdy|

Drive status :|ready|

Controller PROM Rev-2-A, controller has read vendor flaw list capability.

Controller set to the following geometry:

758 cylinders, 2 alt cylinders, 19 heads, 55 sectors  
interleave 1 drive type 2

Formatting the alternate area..

Writing backup labels to disk..ok

Writing to disk any new Alternate Cylinder area flaws discovered..

Writing CV Flaw Map to disk..ok

Writing CV's copy of the Vendor Flaw Map to disk..ok

Writing the slipped sector list to the disk...ok

Formatting the data area..

>>Read<< error,cyl=116, head=3, sector=0 retry=0

Error : (Trk) <e1E> soft ECC error

Controller status : 49 |Hard\_Err|Adr\_24b|Drive\_Rdy|

>>Read<< error,cyl=116, head=3, sector=23 retry=0

Error : <e1E> soft ECC error

Controller status : 49 |Hard\_Err|Adr\_24b|Drive\_Rdy|

Bad spot located sector = 116/3/23

>>Read<< error,cyl=177, head=18, sector=0 retry=0

Error : (Trk) <e1E> soft ECC error

Controller status : 49 |Hard\_Err|Adr\_24b|Drive\_Rdy|

>>Read<< error,cyl=177, head=18, sector=25 retry=0

Error : <e1E> soft ECC error

Controller status : 49 |Hard\_Err|Adr\_24b|Drive\_Rdy|

Bad spot located sector = 177/18/25

Writing primary label to disk..ok

Writing CV Flaw Map to disk..ok

Writing the slipped sector list to the disk...ok

All flaws have been slipped or converted to surface analysis flaws.

# Handling Reported Disk Flaws and Formatting Disks

The updated CV flaw map contains :

1 total flaws

The updated Slip list contains:

1 total flaws

As **prepdisk** formats the disk, it displays the current cylinder/head number. The program passes through all alternate cylinders and then all data cylinders.

4. When **prepdisk** has finished formatting, the Automatic Mode Formatting Menu appears.

Automatic Mode Formatting Menu:

1 - Format

2 - Partition & Label

3 - Change Disk

4 - Exit to PREPDISK\_AUTO

Please enter your selection or type "?" for help <CR=4>

If your original flaw map has been lost, you must reenter the flaw map, following instructions in the next subsection.

If your original flaw map existed prior to formatting, then select 2 to partition and label your disk. For details of the partitioning and labeling procedure, see Section 2.

---

## Procedures for Conflicting Disks on Same Controller

There are four sets of disks that may not occupy the same controller. If you are installing a system that is configured with any of these combinations, you must follow this procedure.

- Type V and a type A on the same controller
- Type W and a type X on the same controller
- Type Y and a type R on the same controller
- Type Z and a type S on the same controller

If you have any of the above pairs of disks occupying different controllers, this procedure is not necessary. For instance, if you have a disk type W on one controller and a disk type X on a second controller, this procedure is not necessary.

On all disks which connect to a Xylogic 450/451 controller a drive type must be specified for each unique disk geometry attached to a particular controller.

Four unique drive types are available for each Xylogic controller installed in a system. Drive types 0, 1, 2, and 3. The drive type is related to a specific disk geometry. All drives with the same geometry should be set to the same drive type.

The *only time* it is *ever* necessary to modify a given disk drive's drive type from the default is: If your configuration contains two disks with different geometries, which have been formatted to be the same drive type and both of these disks are connected to the same controller. This conflict occurs with the four pairs of disks listed above.

In this case, you must either:

- Connect one of each of the disks to separate disk controllers  
or
- Change the drive type of one of the two disks which are in conflict. You must reformat a disk each time you change the drive type.

Table E-1 is a list of the supported disks and their default drive types:

**Table E-1. Disks and Default Drive Types**

| Disk Type | Drive Type | Unformatted Size | Geometry                    |
|-----------|------------|------------------|-----------------------------|
| A         | 0          | 300MB Removable  | 820 cyl 3 alt 19 hd 32 sec  |
| B         | 3          | 300MB Sealed     | 1022 cyl 2 alt 16 hd 32 sec |
| R         | 2          | 515MB Sealed     | 758 cyl 2 alt 19 hd 55 sec  |
| S         | 1          | 515MB Sealed     | 705 cyl 6 alt 24 hd 47 sec  |
| V         | 0          | 1GB Sealed       | 964 cyl 2 alt 27 hd 67 sec  |
| W         | 3          | 1GB Sealed       | 1735 cyl 2 alt 15 hd 67 sec |
| X         | 3          | 515MB Sealed     | 821 cyl 2 alt 15 hd 67 sec  |
| Y         | 2          | 515MB Sealed     | 758 cyl 2 alt 19 hd 56 sec  |
| Z         | 1          | 515MB Sealed     | 705 cyl 6 alt 24 hd 48 sec  |
| ? (Other) | 0          | Unknown          | Defined by user             |



# Handling Reported Disk Flaws and Formatting Disks

---

The table shows both disks A and V as drive type 0, both disks W and X as drive type 3, both disks R and Y as drive type 2, and disks S and Z as drive type 1. (You are not permitted to change the drive type of a removable media disk, disk type A. Therefore, if you have a disk V and a disk A on the same controller, you must change the drive type of disk V.)

The only way to change a disk's drive type once it has been formatted is to reformat the disk. If an attempt is made to read or write to a disk that has been initialized to the wrong drive type, an 'err - header 2' will be reported.

An example follows, showing how to change the drive type of a disk.

## Example of Disk V and Disk A on the Same Controller

In this example, two disks with different geometries, disks V and A, but of the same drive type, both drive type 0, are connected to the same controller. A conflict exists. You must change the drive type of one of the disks. It is not possible or feasible to change the drive type of a disk type A, since it is removable media and may be used on other machines. You must, therefore, change the disk W's drive type. The second example shows the steps necessary to do this, including reformatting, repartitioning and relabeling of the disk.

```
CADDStation Prepdisk Disk Initialization and Diagnostic
Rev-3.18 8/12/88. Copyright (c) <1986> by Computervision
Corporation as an unpublished work. All rights reserved.
```

```
Enter "A" to select automatic mode or
 "M" to select manual mode (A/M) ? <CR=A> RETURN
```

```
Disk Sizing, please wait for about 1 minute ...
```

```
0 - xyc0 drivetype 0/unit 0
 disk type V - 1GB/851MB cyl 964 alt 2 hd 27 sec 67
1 - xyc0 drivetype 0/unit 1
 disk type A - 300Mb/243Mb cyl 820 alt 3 hd 19 sec 32
2 - Manual entry
```

```
Select a disk or type "?" for help <CR=0> ? RETURN
```

```
Performing Initialization on selected Disk type :
Controller status : 9 |Adr_24b|Drive_Rdy|
Drive status : |ready|
Controller PROM Rev-2-A, controller has read vendor flaw
list capability.
Controller set to the following geometry:
964 cylinders, 2 alternate cylinders, 27 heads, 67 sectors
interleave 1 drive type 0
```

---

Automatic Mode Formatting Menu :

- 1 - Format
- 2 - Partition & Label
- 3 - Change Disk
- 4 - Exit to PREPDISK\_AUTO

Please enter your selection or type "?" for help <CR=4> 1

Enter 1 to format the disk.

DISK FORMAT--DESTROYS ALL DISK DATA!--Backup all data before continuing.

The Format command will destroy data on the selected disk. Do you want to continue(Y/N) ? <CR=N> y

Do you want to specify a drive type different from the default for your chosen disk type(N/Y) ? <CR=N> y

Checking current drive type...ok

The disk is presently formatted to be a drivetype 0 which matches the default drivetype for a disk type V.

If you ask to see help information, you see the text printed at the start of this subsection. This example shows an entered n.

Do you need help information on disk drive types(N/Y) ? <CR=Y> n

Do you still want to specify a drive type different from the default for your chosen disk type(N/Y) ? <CR=N> y

At the next prompt, enter a drive type that is not being used on this controller.

Enter the new drive type desired? 2

To format a disk for the first time or after numerous disk errors, five surface analysis passes are recommended. If your disk was formatted previously, one surface analysis pass is sufficient and shortens disk formatting time. For five surface analysis passes, press RETURN here. For one surface analysis pass, enter 1.

How many surface analysis passes <CR=5> ? RETURN

Do you want to see the cylinder#/head# displayed as the disk is being formatted(N/Y) ? <CR=Y> RETURN

Reading the CV flaw map from disk..

OK... Flaw map successfully read.

Reading CV's copy of the Vendor Flaw Map from disk

OK (0 entries)(rev-1)

Reading the slipped sector list from the disk.

OK Slip List successfully read

Changing to the new drive type of 2.

# Handling Reported Disk Flaws and Formatting Disks

---

```
Re-Initializing disk...ok
Controller status : 9 |Adr_24b|Drive_Rdy|
Drive status : |ready|write-protected|
Controller PROM Rev-2-A, controller read vendor flaw list
capability.
Controller set to the following geometry:
964 cylinders, 2 alternate cylinders, 27 heads, 67 sectors
interleave 1 drive type 2
Formatting the alternate area..
Writing backup labels to disk..ok
Writing to disk any new Alternate Cylinder area flaws dis-
covered
Writing CV Flaw Map to disk..ok
Writing CV's copy of the Vendor Flaw Map to disk..ok
Writing the slipped sector list to the disk..ok
Formatting the data area..
 { surface analysis flaws shown here}

Mapping out flaws in the new CV flaw map, please wait
...done
Writing primary label to disk..ok
Writing CV Flaw Map to disk..ok
Writing the slipped sector list to the disk..ok
All flaws have been slipped or converted to surface analysis
flaws.
The new CV flaw map contains :
surface analysis flaw(s)
0 operator entered flaw(s)
0 vendor flaw(s)
0 alternate sector flaw(s)

total flaws {Formatting and surface analysis is complete.}
```

The disk V has now been reformatted to be a drive type 2 disk which does not conflict with the type A disk which is a drive type 0.

PREPDISK\_AUTO > partition

After the initialization is complete, enter the **partition** command. Return to Partitioning and Labeling Your Disks with **prepdisk** in Section 2.

---

## Procedure for Changing Y or Z to R or S

It may be necessary in some cases to change from a type Y disk to a type R disk or from a type Z disk to a type S disk. The cases are

- If the flaw map on the type Y, Z disk becomes full (greater than 126 flaws).
- If you have a type Y disk and a type R disk on the same controller.
- If you have a type Z disk and a type S disk on the same controller.

Changing the disk geometry requires reformatting of the entire disk. If there is any information you need on the disk to be reformatted you must save the information (backup) prior to executing this procedure.

The example shown below outlines the steps necessary to change from a type Y disk to a type R disk. The same type of procedure should be followed to change a type Z disk to a type S disk. The type R,S disks employ slip sectoring as well as mapping for the handling of disk flaws. Slip sectoring allows for the entry of a much greater number of flaws. You must use the manual mode of `prepdisk` for this procedure.

---

### NOTE

Always change a type Y disk to a type R disk. Never change a type R disk to a type Y disk. (Types Y and Z are older geometry configurations). Always change a type Z disk to a type S disk. Never change a type S disk to a type Z disk. (Changing a disk Y or Z to R or S slightly reduces storage capacity by about 10MB.)

---

```
Enter "A" to select automatic mode or
 "M" to select manual mode (A/M) ? <CR=A> m
```

```
Specify controller:
```

```
0 - CADDServer first controller (xyc0)
 (disk types A, B, R, S, V, W, X, Y or Z)
1 - CADDServer second controller (xyc1)
 (disk types A, B, R, S, V, W, X, Y or Z)
2 - CADDStation controller (sc0)
 (disk types C, E, I, J, K, L, N, or O)
controller # <CR=2> ? 0
```

```
Specify controller address on the Multibus (in hex)
<CR=EE40> ? RETURN
```

```
Which unit/disk <CR=0> ? 3
```

# Handling Reported Disk Flaws and Formatting Disks

| Drive # | Disk Type     | Unformatted/Formatted | Geometry                          |
|---------|---------------|-----------------------|-----------------------------------|
| 0       | - disk type A | - 300MB/243MB         | 820 cyl 3 altcyl 19 heads 32 sec  |
| 1       | - disk type B | - 300MB/255MB         | 1022 cyl 2 altcyl 16 heads 32 sec |
| 2       | - disk type R | - 515MB/386MB         | 758 cyl 2 altcyl 19 heads 55 sec  |
| 3       | - disk type S | - 515MB/388MB         | 705 cyl 6 altcyl 24 heads 47 sec  |
| 4       | - disk type V | - 1GB/851MB           | 964 cyl 2 altcyl 27 heads 67 sec  |
| 5       | - disk type W | - 1GB/851MB           | 1735 cyl 2 altcyl 15 heads 67 sec |
| 6       | - disk type X | - 515MB/402MB         | 821 cyl 2 altcyl 15 heads 67 sec  |
| 7       | - disk type Y | - 515MB/393MB         | 758 cyl 2 altcyl 19 heads 56 sec  |
| 8       | - disk type Z | - 515MB/396MB         | 705 cyl 6 altcyl 24 heads 48 sec  |
| 9       | - Other       |                       |                                   |

Enter Drive # <CR=0> ? 2

Do you need help information on disk drive types(N/Y) ?  
<CR=Y> n

Enter Drive Type # <CR=2> ? RETURN

Checking current drive type...ok

The disk is presently formatted to be a drivetype 2 which matches the default drivetype for a disk type R.

Performing Initialization on selected Disk type :

Controller status : 9 |Adr\_24b|Drive\_Rdy|

Drive status :|ready|

Controller PROM Rev-1-C

Controller set to the following geometry:

758 cylinders, 2 alt cylinders, 19 heads, 55 sectors  
interleave 1 drive type 2

PREPDISK\_MANUAL > fo

DISK FORMAT -- DESTROYS ALL DISK DATA! -- Backup all data before continuing.

The Format command will destroy data on the selected disk. Do you want to continue(Y/N) ? <CR=N> y

Do you want to specify a drive type different from the default

for your chosen disk type(N/Y) ? <CR=N> RETURN

Checking current drive type...ok

The disk is presently formatted to be a drivetype 2 which matches the default drivetype for a disk type R.

How many surface analysis passes <CR=5> ? RETURN

Do you want to see the cylinder#/head# displayed as the disk is being formatted(N/Y) ? <CR=Y> RETURN

Reading the CV flaw map from disk..

OK... Flaw map successfully read.

Reading CV's copy of the Vendor Flaw Map from disk..ok(0 entries)(rev-1)

Reading the slipped sector list from the disk.

check sum and/or ID number is incorrect.

Unable to read slipped sector list from alt cyl.

---

Creating the slipped sector list by reading headers.  
Changing to the new drive type of 2.

```
Re-Initializing disk...ok
 Controller status : 9 |Adr_24b|Drive_Rdy|
 Drive status :|ready|
 Controller PROM Rev-1-C
 Controller set to the following geometry:
 758 cylinders, 2 alt cylinders, 19 heads, 55 sectors
 interleave 1 drive type 2
Formatting the alternate area..

Writing backup labels to disk..ok
Writing to disk any new Alternate Cylinder area flaws discovered..
Writing CV Flaw Map to disk..ok
Writing CV's copy of the Vendor Flaw Map to disk..ok
Writing the slipped sector list to the disk...ok
Formatting the data area..
>>Read<< error,cyl=46, head=3, sector=0 retry=0
 Error : (Trk) <e1E> soft ECC error
 Controller status : 49 |Hard_Err|Adr_24b|Drive_Rdy|
>>Read<< error,cyl=46, head=3, sector=14 retry=0
 Error : <e1E> soft ECC error
 Controller status : 49 |Hard_Err|Adr_24b|Drive_Rdy|
 Bad spot located sector = 46/3/14
 {{ other errors will appear here }}

Writing primary label to disk..ok
Writing CV Flaw Map to disk..ok
Writing the slipped sector list to the disk...ok
All flaws have been slipped or converted to surface analysis
flaws.
The updated CV flaw map contains :
 1 total flaws
The updated Slip list contains:
 7 total flaws
PREPDISK_MANUAL >
```

You will need to partition and label your disk; see Section 2, Partitioning and Labeling Disks—prepdisk Utility.

# Handling Reported Disk Flaws and Formatting Disks

## Reentering Flaw Maps on SMD Disks

All disks normally contain an internal flaw map. If the flaw map is lost from the disk because of a hardware failure, you must manually add the flaw map to the disk. Format your disks first, using the earlier procedure, Formatting SMD Disks.

1. Obtain a copy of the defect list that comes with your system. Field Service can supply this list. Photocopy it and put it in your system administration logbook.
2. Look at the manufacturer's list that comes with your system (Table E-2). The list has several headings. Look at the columns labeled CYL, HD, and DEF1.

Table E-2. Sample List of Manufacturer's Flaws

| CYL<br>Cylinder | HD<br>Head | DEF1<br>Position and Length |
|-----------------|------------|-----------------------------|
| 32              | 2          | 1254- 9                     |
| 25              | 9          | 14051- 23                   |
| 103             | 8          | 31557- 2                    |

The first number in the DEF1 column is the position of the flaw (disregard the dash). The second number in the DEF1 column is the length of the flaw.

You must map flaws in order from largest to smallest. The length column indicates the size of the flaw (number of bits in error). Number the flaws on the list from largest to smallest.

3. Prepare a Flaw Map Worksheet arranged like Table E-3. Make four headings: the cylinder that the flaw occurs on, the head number, the bytes-from-index (BFI) (the same as the DEF1 position), and the length of the flaw.

Enter the flaws from the manufacturer's list onto your worksheet, *with the flaws listed by length, the longest first*. Work on only a few lines at a time; add lines as you go.

Table E-3. Sample Flaw Map Worksheet

| CYL   | HEAD (track) | BFI   | LENGTH |
|-------|--------------|-------|--------|
| _____ | _____        | _____ | _____  |
| _____ | _____        | _____ | _____  |
| _____ | _____        | _____ | _____  |

4. Return to the appropriate procedure earlier in this section, either Procedures for Flaws on A, B, Y, and Z (300MB and 515MB) Disks or Procedures for Flaws on R, S, V, W, and X (515MB and 1GB) Disks.

# Background Information about Disk Configuration

---

# F

This appendix describes general concepts about disks and disk configuration. It explains many of the operations that **setup** supports when changing disks. The following are some general concepts that are fundamental to the way **setup** (and UNIX) uses disks.

## Sectors

---

The basic memory unit of the disk is a sector. Computervision disk sectors are 512 bytes, the same size as a block. Sectors are grouped into tracks. A track is the maximum number of sectors that fits on one *circle* of a disk platter. Tracks in the same location on all platters are grouped together as cylinders.

## Partitions

---

Each disk has a maximum of eight hard partitions, by convention named a through h. These hard partitions implement a virtual disk scheme to create separate sections of a physical disk. Disks do not need to use all of the available hard partitions. Each hard partition has an *offset* and a size. Hard partition offsets must be in cylinders, but their sizes may be in either cylinders or sectors. For performance reasons, hard partition sizes are usually also in cylinders. Hard partitions that overlap one another can be created, but overlapping partitions cannot be used by UNIX simultaneously and are not recommended.

## Labeling

---

The configuration of the hard partitions is encoded within the disk label. The label, written to special locations on the disk by the **prepdisk** program, can be changed by **setup**. The label is read from the disk by UNIX at boot time to determine the disk configuration. Programs such as **dkinfo** read the label from the disk and produce a list of hard partition offsets and sizes.

Be cautious about creating or changing disk labels. If the disk label needs to be changed after UNIX is installed, all information on the disk should be saved before modifying the label. Changing a hard partition's size or offset destroys all information on that hard partition.



# Background Information about Disk Configuration

---

## Network Disk (ND) and Soft Partitions

---

The ND facility implements a mechanism to divide hard partitions into soft partitions. These soft partitions are used to provide diskless clients with root and swap partitions. In addition, there are ND Public partitions that allow soft partitions to be shared as read-only between diskless clients. Public partitions are used to share executable and common configuration files between workstations. ND configuration information is kept in the `/etc/nd.local` file. This file is the equivalent of the soft partition label, providing soft partition offsets and sizes. (For more information see `nd(8)` in the UNIX command reference.)

`setup` changes the offsets and sizes of both hard and soft partitions depending on the configuration being installed. `setup` allows you to manually change the partition configurations. During installation, `setup` writes a new disk label and creates a new `/etc/nd.local`. The `setup` disk screen shows the hard partitions and allows you to edit them. You create/edit ND partitions from the `setup` Client form. (`setup` has the limitation that soft partitions can be created and edited only in conjunction with a diskless client.)

## Partition Use in setup

---

`setup` uses disk hard partitions in a way that is unique to the type of configuration you are installing. `setup` requires that a workstation be configured as either a workstation or a server. When choosing or changing types, `setup` dynamically changes the use of many of the hard partitions. Care should be taken to choose your type of configuration before spending time configuring your disks via `setup` since this information may be lost if you change configurations.

`setup` allows you to configure servers to serve either or both 68010 and 68020 architectures. For each architecture a server is configured to serve, one hard partition is used for a public file system (`/pub`) and a second for a user file system (`/usr`). When a workstation is configured as a server, it has common files as if it were a diskless client. Therefore, `setup` requires that a server must serve its own architecture.

### NOTE

- If you choose Relabel Disk = NO, all partition sizes you modify in `setup`, except for Client's root/swap Size, will have no effect on disk.
- You can modify the swap partition from `setup` only to make it larger than you made it during `prepdisk`; you cannot make it smaller than its initial size.
- Partition `c` spans the entire disk. During installation, `setup` also uses `c` as the first ND partition (that is, `/etc/nd.local` allocates a portion of partition `c` for ND clients). The label still has `c` configured as the entire disk, so you must relabel when creating an ND partition.

## Hard Partition Types and Attributes

---

`setup` allows you to create and edit the types of hard partitions in Table F-1. Hard partition attributes are shown in Table F-2.

---

**Table F-1. Types of Hard Partitions**

---

| Partition        | Use of Partition                                                                                                                                                                                                                                                                                                                                                      |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNIX Partitions  | Used as UNIX file systems. During installation, <b>setup</b> creates a UNIX file system on UNIX partitions, creates required directories to mount the file system, and generates the correct entry for the file system table (see <b>fstab(5)</b> ).                                                                                                                  |
| Free Partitions  | Not used by <b>setup</b> . They can have an offset and a size, and will be configured into the label. When a partition's type is changed to free, its size is set to zero.                                                                                                                                                                                            |
| Swap Partitions  | Used by UNIX for swap space.                                                                                                                                                                                                                                                                                                                                          |
| ND Partitions    | Used by <b>setup</b> to provide partitions for diskless clients. When a partition's type is changed to ND, its size is set to zero. An ND partition's size can only be modified when soft partitions are assigned to it from the <b>setup</b> client screen. An ND partition's type cannot be changed while it contains any soft partitions used by diskless clients. |
| Other Partitions | The same as free partitions. They are a means for you to create a partition that <b>setup</b> will consider using for other purposes.                                                                                                                                                                                                                                 |

---

**Table F-2. Hard Partition Attributes**

---

| Attribute         | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overlapping       | <b>setup</b> allows hard partitions to be overlapped, meaning that a label can be created so hard partitions share disk locations. By default, <b>setup</b> does not configure disks with overlapping partitions and they are not recommended.                                                                                                                                                                                                                                                                                                                           |
| Floating          | <b>setup</b> allows disk floating; when a disk is floating, hard partition offsets are automatically changed so that hard partitions abut one another (i.e., one partition begins where the previous one ended). Floating only affects the portion of <b>c</b> used for ND partitions. When a disk is floating, you cannot directly change a hard partition's offset. By default, floating is on when <b>setup</b> begins. Floating (1) cannot be turned off on a disk containing special partitions and (2) is not allowed on a disk containing overlapping partitions. |
| Free hogs         | When a disk is floating, <b>setup</b> allows one hard partition to take up all available disk space not explicitly used by other hard partitions. This is called the free space hog. It shrinks as other hard partitions grow. On a server, the free space hog is typically the hard partition that contains home directories.                                                                                                                                                                                                                                           |
| Partition moving  | <b>setup</b> lets you move some special partitions ( <b>/usr</b> and <b>/pub</b> ) to other hard partitions. The destination partition in a move must be of type free.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Cylinder rounding | <b>setup</b> allows you to round partitions to cylinder boundaries (hard partition offsets are always rounded to cylinder boundaries). By default, cylinder rounding is on, meaning that sizes you enter are automatically rounded to the next cylinder boundary for that disk. For optimal performance, it is a good idea to round partitions to cylinder boundaries.                                                                                                                                                                                                   |

---

# Using the Terminal Interface of setup

---

## G

If you chose the terminal interface, read this appendix to learn how to move the cursor from place to place. Then return to Section 4, Configuring the System/Loading System Software—**setup** Utility, which describes all requested information on window interface forms. The information requested is identical for both versions.

The terminal interface displays three regions. The top region is the control panel, containing buttons that bring up other forms you need to fill out. The middle region is the message region, which displays error messages and prompts. The bottom region is where you enter information. To move between regions, use CTRL-N or CTRL-P. Press RETURN after you have typed information; the cursor moves to the next item. In addition to RETURN, two keys move the cursor from one item to another. Table G-1 is a quick reference to the control keys. Use ^C (CTRL-C) to exit at any time.

**Table G-1. setup Terminal Interface Control Keys**

| Cursor Movement | Next/Forward       | Previous/Backward   |
|-----------------|--------------------|---------------------|
| Region          | CTRL-N             | CTRL-P              |
| Item/Scrolling  | RETURN or CTRL-F   | CTRL-B              |
| Choice/Toggle   | RETURN or SPACEBAR | BACKSPACE or DELETE |
| Select Item     | X or x             | X or x              |
| Enter Text      | RETURN             | RETURN              |
| Redraw          | CTRL-R             | CTRL-R              |

# Using the Terminal Interface of setup

To enter information to setup, move the cursor to an item and set that item. To the left of each item, a label describes the information requested for that item. To the right of the label are possible values for the item. To move the cursor between items, hold down the CTRL key and press an alphabetic key (for example, CTRL-F). Figure G-1 illustrates the terminal interface. Table G-2 shows how to enter information.

Figure G-1. Terminal Interface

| (WORKSTATION)<br>DEFAULTS | CLIENTS<br>EXECUTE-SETUP                 | SOFTWARE<br>REBOOT | DISKS<br>EXIT |
|---------------------------|------------------------------------------|--------------------|---------------|
| -----                     |                                          |                    |               |
| Message Log:              |                                          |                    |               |
| -----                     |                                          |                    |               |
| (Workstation Name):       | bertha                                   |                    |               |
| (Workstation Type):       | [ ] None, [ ] Standalone [ ] File Server |                    |               |
| /usr disk location:       | <X> First disk    < > second Disk        |                    |               |
| System UNIX Type          | [ ] One Tape [ ] Two Tape [ ] None       |                    |               |
| Tape Device:              | [X] 1/4" SCSI (st0)                      |                    |               |
| Tape Location:            | [X] Local                                |                    |               |
| Ethernet Interface:       | [X] Sun Intel (ie0)                      |                    |               |
| Host Number:              | 1                                        |                    |               |
| YP Type:                  | [X] None                                 |                    |               |
| Relabel Disk              | [X] Yes    [ ] No                        |                    |               |

---

**Table G-2. Entering Information on the Terminal Interface**

---

| <b>Item</b>                                    | <b>Interaction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Text</b>                                    | A blinking caret shows where keyboard input appears. Key in the text, then press RETURN. <b>setup</b> places the caret at next text item to be filled in. When typing, DEL erases character; CTRL-W erases a word; CTRL-U erases text in input field. If you type more characters than text field allows, characters scroll left, left arrow appears, and you cannot type any more characters. (In Figure G-1, Workstation Name is a text item.)                                                                     |
| <b>Choice</b>                                  | Presents list of choices; pick one from list: [X] choice1, [ ] choice2 Current choice is denoted by X. To change choice, move cursor to next choice with the spacebar, or to previous choice with DEL or BACKSPACE. When cursor indicates choice wanted, select by pressing X; box will be marked X. Choice items can also be a cyclic choice item with only one choice visible at a time. Use SPACEBAR or DEL to make a new choice and overwrite previous choice. In Figure G-1, Workstation Type is a choice item. |
| <b>Toggle</b>                                  | Contains list of choices but allows you to pick more than one item. Toggle each choice on and off: toggle item label: <X> toggle1, < > toggle2, <X> toggle3. Use SPACEBAR or DEL to move cursor from one element to another. Press X to turn item from off to on or on to off. In Figure G-1, Optional Software is a toggle item.                                                                                                                                                                                    |
| <b>Button</b>                                  | Causes <b>setup</b> to perform an action. Use buttons in the screen's control region to display forms or perform the installation. In Figure G-1, SOFTWARE, REBOOT, and DISKS are three buttons. Cursor appears left of button's first letter. Hit X key to press the button.                                                                                                                                                                                                                                        |
| <b>Scrolling Messages</b>                      | Scroll messages in the message region as follows: place cursor in message area and move cursor up and down with CTRL-F or RETURN and CTRL-B. Messages scroll one line at a time.                                                                                                                                                                                                                                                                                                                                     |
| <b>Moving to other forms, Executing setup.</b> | Click boxes on the control panel across the top of the screen to access the different <b>setup</b> forms and to execute final configuration when forms are complete. (The button for the form currently displayed is in reverse video.)                                                                                                                                                                                                                                                                              |
| <b>Errors</b>                                  | Input items in error or in need of attention are in parentheses (for example, (Workstation Name:)). Parentheses indicate <b>setup</b> needs the information to do its job correctly, or value you gave the item is illegal. You must correct values before pressing EXECUTE-SETUP button.                                                                                                                                                                                                                            |

---

Return to Section 4, Configuring and Loading the System—**setup** Utility, which describes all requested information on window interface forms. The information requested is identical for both the window interface and the terminal interface.

# Creating a Diskful NFS Client

---

# H

The Network File System (NFS) enables you to use a file system on one system that actually lives on another system, thereby saving memory space. The system that actually has the file system is the NFS server. The system that is remotely using it is the NFS client. The NFS server can be a server or a stand-alone system. The diskful workstation has a disk, may or may not have a tape drive, and it is *not* configured as a client on a server.

The diskful NFS client has the UNIX root partition and part storage on its disk. The Diskful Client utility sets up the diskful workstation to use the UNIX /usr partition on the NFS server using the NFS facility. If the NFS server has application software installed, the NFS client can also be configured to run this software.

The Diskful Client utility performs the following tasks:

- Creates a new /etc/fstab file
- Creates new local directories
- Reconfigures your spooling directories
- Links your UNIX-owned /usr directories and/or application packages to a Network File System (NFS) server

Before you use Computervision's Diskful Client utility, you must have the following:

- The Ethernet network up and running
- Your diskful client and the NFS server configured to talk to each other over the network

For more information on network set-up and the NFS, refer to *Setting Up and Managing the Network* in the *CADDStation Systems Network Guide*. See also `mount(8)` in the UNIX command reference.

1. You must enable `netroot` on the NFS server. To enable `netroot`, log in to your NFS server as `root` and issue the following command:

```
/etc/netroot on
```

2. Log in as `root` to the diskful workstation you want to configure as an NFS client and halt your system with the following command:

```
/etc/halt
```

3. After your system is halted, boot it for single-user operation:

```
> b -s
```

## Creating a Diskful NFS Client

---

4. After the system is up and running, enter this command at the system prompt:

```
diskful_client
```

The system displays the following:

```
This command allows you to configure a standalone workstation into a NFS client. By doing so, you will have:
```

- Greater local disk storage space.
- Access to software packages that do not exist on your system.

Before executing this command, these requirements must be met:

- Establish contact with your NFS Server through your Ethernet.
- Enable network root on your NFS Server.
- Boot your system for single-user operation.

CAUTION: Executing this command will alter your system software.

```
Do you want to continue ? (y/n RETURN = y)
```

Press RETURN to continue or enter n to exit the program and go back to the system prompt.

5. A series of questions appears on your screen. Answer as appropriate for your system.

```
Starting network services. Please wait ...
```

```
From what NFS Server are you mounting the /usr partition?
```

```
Is your NFS Server a standalone workstation? (y/n RETURN)
```

```
Altering the /etc/fstab. This allows the /nfsusr directory to be mounted from system-name at boot-up time.
```

```
Please wait ...
```

6. The utility creates an /nfsusr directory that is mounted to the /usr file system on the NFS server. If a file system is already mounted on your /nfsusr directory, the screen displays the following:

```
A filesystem is already mounted on the /nfsusr directory. Please remove this filesystem entry from your /etc/fstab file.
```

The program returns you to the system prompt. You must remove the previously created /nfsusr entry from the /etc/fstab file. Restart the diskful\_client command.

- 
7. In this step, you reconfigure your local, /usr, and spooling directories. Answer the following question as appropriate for your system.

Do you want to create a new /usr partition ? (y/n RETURN)

If you have directories in your /usr partition that you want to maintain, such as part storage, answer n to this question. If you have not set up your /usr partition, answer y to this question. The utility continues:

Creating required local directories. Please wait ...

Clearing the /usr/adm directory ...

So far, your system has been altered in the following ways:

- . A new /etc/fstab file has been created.
- . Required local directories have been created.
- . Spooling directories have been reconfigured.

8. In this step and step 9, you create links between the NFS server and client. The system prompts

Do you want to link the UNIX owned /usr directories to the NFS Server ? (y/n RETURN)

If you answer n for no, you can choose what directories you want to link and enter link commands manually. You see this message:

No links from the /usr directory will be made to the NFS Server.

If you answer y for yes, the utility makes links for UNIX directories and files to the NFS server for you.

9. The system displays:

Creating links to the NFS Server. Please wait ...

Do you want to link your application packages to the NFS Server ? (y/n RETURN)

If you answer n for no, the system displays:

Rebooting NFS-servername ...

If you answer y for yes, the utility displays:

This operation must be done manually. Please refer to your CADDStation Systems Software Installation Guide, make the appropriate links, and then reboot your system.

This prompt refers to the application links described in the subsection called Linking Application Directories at the beginning of this section. See also ln(1) in the UNIX command reference. See additional information on the Network File System in *Setting Up and Managing the Network*.



# Increasing swap with the prepdisk Utility

---

Follow this procedure to increase the amount of swap space you have on a server.

You may change the amount of swap space on any disk except your first disk, disk 0. That is, you can change swap on your second disk, your third disk, etc.

In this procedure you increase the swap partition (here partition h) and decrease a partition with extra space (here partition g).

The example below increases swap on disk 1, xy1, partition h. It decreases partition g. Substitute the partitions you are increasing and decreasing for the ones shown.

Back up the partition that you are going to decrease onto tape using the dump command.

```
dump fun0 /dev/rmt0 /dev/xy1g
/etc/halt
>b stand/prepdisk

Boot: sd(0,0,0)stand/prepdisk
Load: sd(0,0,0)boot
Boot: sd(0,0,0)stand/prepdisk
Size: 86236+132508+77176 bytes
```

```
CADDStation Disk Initialization and Diagnostic Rev-3.3
08/19/87
```

```
Enter "A" to select automatic mode or
 "M" to select manual mode (A/M) ? <CR=A> A
```

```
Disk Sizing, please wait for about 1 minute ...
```

```
0 - <t0/u0> disk type n cyl nnn alt n hd n sec nn
1 - <t0/u1> disk type n cyl nnn alt n hd n sec nn
4 - Manual entry
```

```
Select a disk or type "?" for help <CR=0> ? 1
Performing Initialization on selected Disk type :
```

```
Automatic Mode Formatting Menu:
```

- 1 - Format
- 2 - Partition & Label
- 3 - Change Drive
- 4 - Exit to PREPDISK\_AUTO

```
Please enter your selection or type "?" for help <CR=4> 2
```

# Increasing swap with the prepdisk Utility

PARTITION Sub-commands menu :

Quit - quit the Partition command  
Help - print out this menu, additional help if requested  
RP - Recover partition table from disk  
DP - Default partition table  
CP - Current Partition table in memory  
LA - Label the Disk

PREPDISK\_AUTO/PARTITION > rp

Reading primary label from disk..ok

id: <disk type n cyl nnn alt n hd n sec nn>

| Partition | Starting Cylinder | Sectors | Cylinders | Mbytes |
|-----------|-------------------|---------|-----------|--------|
| c         | 0                 | nnnnn   | nnn       | 393.00 |
| g         | 0                 | nnnnn   | nnn       | 300.00 |
| h         | nnn               | nnnnn   | nnn       | 93.00  |

PREPDISK\_AUTO/PARTITION > cp

| Partition | Starting Cylinder | Sectors | Cylinders | Mbytes |
|-----------|-------------------|---------|-----------|--------|
| c         | 0                 | nnnnn   | nnn       | 393.00 |
| g         | 0                 | nnnnn   | nnn       | 300.00 |
| h         | nnn               | nnnnn   | nnn       | 93.00  |

Do you wish to modify this table(Y/N) ? <CR=N> y

In this example the swap is increased by 100MB. Press RETURN for each question until you get to the g partition.

Total Size = nnnnnn Sectors, nnn Cylinders, 393.00 Mbytes

Partition a starting cylinder <CR=0> RETURN

Partition a <CR=0> (Mbytes) ? RETURN

Partition b starting cylinder <CR=0> RETURN

Partition b <CR=0> (Mbytes) ? RETURN

Partition d starting cylinder <CR=0> RETURN

Partition d <CR=0> (Mbytes) ? RETURN

Partition e starting cylinder <CR=0> RETURN

Partition e <CR=0> (Mbytes) ? RETURN

Partition f starting cylinder <CR=0> RETURN

Partition f <CR=0> (Mbytes) ? RETURN

Subtract the amount you are increasing swap from the size of partition g:  
100MB.

Partition g starting cylinder <CR=0> RETURN

Partition g <CR=300> (Mbytes) ? 200

Add the amount you are increasing swap to the previous amount in partition h:

Partition h starting cylinder <CR=nnn>

Partition h <CR=93> (Mbytes) ? 193

# of free Sectors = 1890

# of free Cylinders = 6

```

of free Mbytes = 0.92
Enter float partition (a,b,d,e,f,g or h): <CR=g> ? RETURN

Partition Starting Cylinder Sectors Cylinders Mbytes
c 0 nnnnnn nnn 393.00
g 0 nnnnnn nnn 200.00
h nnn nnnnnn nnn 193.00

Ok to use this as partition map(N/Y) ? <CR=Y> RETURN

```

Use the label command to write out the partition table.

```

PREPDISK_AUTO/PARTITION > la

Do you still want to label the disk (y/n) ? <CR=N> y

 Writing primary label to disk . . ok
 Writing backup labels to disk . . ok

PREPDISK_AUTO/PARTITION > q

Automatic Mode Formatting Menu :

 1 - Format
 2 - Partition & Label
 3 - Change Drive
 4 - Exit to PREPDISK_AUTO

Please enter your selection or type "?" for help <CR=4> 4
PREPDISK_AUTO > q

```

Boot up as single user.

```

> b -s
Singleuser boot -- fsck not done

```

Run newfs and fsck on your partition xy1g.

```

newfs /dev/rxy1g
fsck /dev/xy1g

```

Change to the directory mounted on /dev/xy1g.

```

cd /usr2

```

Load the dump tape for /dev/xy1g that you created at the start of this procedure.

```

restore rvf /dev/rmt0
fsck /dev/xy1g
(CTRL-d) (control d boots up multiuser)

```

If the system has already been configured for multiple drive swap, the procedure is complete. If you are adding a new swap partition to a system that did not have swap on multiple drives, then you must reconfigure the kernel. See Section 5 of this book.



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