TC2000™ System Software Installation Guide

Revision: nX 3.0

July, 1991

BBN Advanced Computers Inc.

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RELEASE LEVEL

This manual conforms to the Released 3.0 Version of the nX™ operating system software, released in July of 1991, for the TC2000™ multiprocessor.

NOTICE

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TRADEMARKS

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How to Use This Manual

Purpose of the Manual

This manual is a guide to installing or updating the nX operating system on the TC2000 computer. After reading this document, you should be able to install the system software and boot from it.

Revision History

This is the version of the manual for release 3.0 of the nX software distribution. This version contains the following changes from the version for the nX 2.0 software distribution:

- The document only describes how to install the nX software on SCSI disk subsystems; SMD interfaces are no longer supported.

Other Places to Find Answers

If you experience any problems with our product, or if you have questions or suggestions, please do one of the following:

- Send electronic mail from anywhere on the Internet to:

  aci-questions@bbn.com

- Send mail to:

  ACI Bugs
  BBN Advanced Computers Inc.
  10 Moulton St.
  Cambridge, MA 02138

- If you are under warranty, or have a software maintenance contract, you can also call our hotline number:

  1-800-4AC-BFLY (1-800-422-2359) in the United States
  1-617-873-8660 from any other location

If you are reporting a problem, please include as much information as you can, as follows:

- The operating system **version** and multiprocessor **model name**
- The **size** of your multiprocessor (number of function cards and amount of memory)
- The **number of nodes** that were in the cluster when the problem occurred (if relevant)
- An **example** that illustrates the problem
- A **record** of the sequence of events that led to the problem; especially a stack backtrace (see the system administration guide)

We are also interested in your evaluation of our documentation. We would appreciate it if you would fill out the form at the back of this manual and return it to us.

Audience Level

The primary audience for this document consists of users who are new to the nX operating system and the TC2000 computer. The document does not assume that you have used a UNIX operating system before, but it does assume that you have used some operating system and that you are familiar with common computer terms, such as files and directories.

Other References

Other installation and configuration information exists in the *TC2000 System Administration Guide* and the *TC2000 Network Administration Guide*. Consult them where indicated in this manual.

Using the TC2000 Document Set is a guide to the entire set of manuals that came with your TC2000 computer. If you're not sure where to look for information, this is a good place to start.

For basic information on the nX operating system see the *Getting Started with the nX Operating System* book.

For complete reference information about all the nX commands, library routines, and utilities, see the *nX Programmer's Reference*, the *nX Software Tools* manual, and the *nX Supplementary Documents, Vol. I* and *Vol. II*.

Organization

This manual describes the installation process from the beginning of the installation to the end. Since the installation involves a series of consecutive steps, the manual is organized as a user would install software. To install software on a new system, or to update software, begin with Section 1.

Typographic Conventions

This manual uses the following conventions to present information:

bold	Text in **bold** indicates an exact filename, a command, or user input.
italics	Text in *italics* indicates a variable, or a value that the user supplies; for example, *filename* stands for the file under discussion.
`type`	Text in `typewriter` font represents computer output.
bold italics	Text in ***bold italics*** indicates an emphasized word or phrase.
<Delete>	Names enclosed in angle brackets indicate keyboard keys; for example, <Delete>, <Esc>, and <Return>.
<Control-Z>	Two key names enclosed in angle brackets indicate that you should press the keys simultaneously; for example, <Control-Z> means that you should hold down the Control key and press the Z key.<>
<Esc>Z	A single key name enclosed in angle brackets followed immediately by another key name indicates that you should press the first key and ***then*** the second; for example, <Esc>Z means that you press the Escape key and ***then*** press the Z key.
↵	This symbol represents the <Return> key in computer dialog examples.
[ ]	In command syntax descriptions, square brackets enclose optional items.
. . .	A horizontal ellipsis indicates a repetition of the previous command or input string.
. . .	A vertical ellipsis indicates that irrelevant portions of a program have been omitted.

Installing the nX Operating System

This book describes the procedure for installing software on a TC2000 computer. It explains the procedure for a full software installation and an update installation. With a ***full*** installation, you will be installing software on a new system. With an ***update*** installation, you will be installing software on a system that is currently running. Most of the steps pertain to both types of installations; steps that apply to only one are marked in the heading.

The installation consists of these basic steps:

1. Prepare for the Installation
2. Set up the Terminal
3. Shut Down the System (update only)
4. Access the 5¼-Inch Floppy Disk Drive
5. Install the TCS Software (including the TCS operating system, TCS executive, and TCS diagnostics)
6. Format the SCSI Disk (full install only)
7. Copy the Mini-Operating System
8. Boot the Mini-Operating System
9. Verify the Date and Time
10. Install System Software
11. Configure TEX dependent files
12. Boot Single User
13. Prepare Filesystems
14. Edit Files
15. Install the Patch Tape and Boot Multi User
16. Install nX Diagnostics
17. Install Xtra
18. Install Fortran
19. Configure the Operating System

CAUTION

Do not place items on top of your TC2000 computer. The TC2000 housing is designed so that air circulates around the vents on the machine. Placing items on top of the TC2000 computer disrupts the air flow and can result in damage to your machine.

Section 1

Prepare for the Installation

Step 1

Make sure that your VT320 console and LA75 printer (if present) are installed and turned on. If they are not, consult the appropriate manual listed below:

VT320 console	*Installing and Using the VT320 Video Terminal*
LA75 printer	*Installing and Using the LA75 Companion Printer*

Step 2

If you plan to have a Wide Area Network (WAN) or a Local Area Network (LAN) that will access or be accessed by other networks, consult the *TC2000 System Administration Guide* for information about your Internet Protocol (IP) address.

Step 3

Check that you have the following items, which are shipped with the TC2000 machine:

- DOS floppy disks, with shrinkwrap and license
- *DOS Reference Manual*
- TC2000 documentation set
- TC2000 documentation update sections
- *Release Notes* for Fortran, C++, Ada, Xtra, and pSOS+m, if purchased.

Step 4

Check your diskettes and tapes for the correct version number. This manual supports the version numbers listed below.

This manual supports the following versions in the **3.0** software.

TCS floppies (5¼-inch floppy diskettes)	**Label**	**Version**
	TCS Operating System	2.9.9
	TCS Diagnostics (1 of 2)	2.9.9
	TCS Diagnostics (2 of 2)	2.9.9
	TCS Application Support	2.9.9
nX tape set (¼-inch cartridge tapes)	**Label**	**Version**
	SCSI Stand-alone Tape	3.0.0
	/ file system	3.0.0
	/usr file system (1 of 2)	3.0.0
	/usr file system (2 of 2)	3.0.0
	Optional software	3.0.0
	nX Diagnostics Tape	2.9.9
Patch Tape, if supplied (¼-inch cartridge tape)	**Label**	**Version**
	nX Patch Tape	3.0.1
Optional Products, if purchased (¼-inch cartridge tapes)	**Label**	**Version**
	TC2000 Fortran-77	3.0.1
	TC2000 Xtra	3.0.0
	TC2000 pSOS^{+m}	1.2.0
	TC2000 C^{++}	3.0.1
	TC2000 Ada	1.0.2

This manual supports the following versions in the **3.0** software.

Bootstrap version	**1.67**
DiskTool version	**1.006**
Sacopy version	**1.16**
Serial port driver version	**1.001**
TC2000 TEX version	**4.790**

Section 2

Set up the Terminal for a Full Installation

In this section, you will be setting up the VT320 terminal for the installation. You will be changing the default terminal settings to coincide with the host system.

If you are performing an update installation, the terminal should already be set up. If you want to change the settings, perform the steps in this section; otherwise, go on to Section 3 to verify the terminal settings and make some minor changes.

If you are performing a full installation, perform all the steps in this section.

How to use the Set–Up Menus. The set up procedure works through a series of menus; each menu contains a number of options. To select an option within a menu, press the arrow keys on the editing keypad to move to the option; when you have selected the option, it is displayed in reverse video (shown as underlined text in this document). To change a *selected* menu option, press <Enter> (***do not*** press <Return>).

Step 1

Press <Set-Up> (the third key from the left on the top left of your keyboard) to display the Set–Up directory menu.

The **Set–Up Directory** menu appears on the bottom third of your screen:

```
Set-Up Directory                                          VT320  V1.1
 Display   General   Comm    Printer    Keyboard    Tab

 On Line   Clear Display   Clear Comm    Reset Terminal      Recall    Save

 Set-Up English              North American Keyboard           Default   Exit

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```

Step 2 Select the `Default` option and press <Enter> to reset the defaults in the menus.

```
Set-Up Directory                                          VT320  V1.1
 Display   General   Comm    Printer    Keyboard    Tab

 On Line   Clear Display   Clear Comm   Reset Terminal     Recall    Save

 Set-Up English            North American Keyboard          Default   Exit

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```

Step 3 Select the `Display` option and press <Enter>.

The **Display Set-Up** menu appears on the bottom of your screen:

```
Display Set-Up                                            VT320  V1.1
 To Next Set-Up    To Directory    80 Columns   Interpret Controls

  No Auto Wrap     Smooth Scroll   Light Text, Dark Screen

  Cursor           Block Cursor Style           No Status Display
```

Step 4 Select `No Auto Wrap`, and press <Enter> until `Auto Wrap` appears.

Step 5 Select `Smooth Scroll`, and press <Enter> until `Jump Scroll` appears.

Step 6 Select `To Next Set-Up` and press <Enter>.

The **General Set-Up** menu appears on the bottom of your screen:

```
General Set-Up                                            VT320  V1.1
 To Next Set-Up    To Directory   VT300 Mode, 7Bit Controls   VT320 ID

  User Defined Keys Unlocked     User Features Unlocked    7 Bit Characters

  Numeric Keypad    Normal Cursor Keys     No New Line

  UPSS DEC Supplemental
```

Step 7 Select VT300 Mode, 7Bit Controls, and press <Enter> until VT100 Mode appears.

Step 8 Select VT320 ID, and press <Enter> until VT100 ID appears.

Step 9 Select To Next Set-Up and press <Enter>.

The **Communications Set-Up** menu appears on the bottom of your screen:

```
Communications Set-Up                                    VT320   V1.1
To Next Set-Up     To Directory   Transmit = 9600        Receive=Transmit

 XOFF at 64        8 Bits, No Parity    1 Stop Bit        No Local Echo

 RS232, Data Leads Only    Disconnect, 2 s Delay          Limited Transmit

 No Auto Answerback   Answerback=                         Not Concealed
```

Step 10 Select Transmit = 9600, and press <Enter> until Transmit = 2400 appears.

Step 11 Select To Next Set-Up, and press <Enter>.

The **Printer Set-Up** menu appears on the bottom of your screen:

```
Printer Set-Up                                           VT320   v1.0
To Next Set-Up      To Directory   Speed=4800   No Printer  to  Host

 Normal Print Mode  XOFF 8 Bits,  No Parity     1 Stop Bit

 Print Full Page    Print National Only         No Terminator
```

NOTE

This manual recommends that you install your printer and leave the printer on to document any problems that may occur during the installation. For instructions on installing your printer, consult the *Installing and Using the LA75 Companion Printer* manual.

Step 12 Select `Normal Print Mode`, and press <Enter> until `Auto Print Mode` appears.

Step 13 Select `Speed = 4800`, and press <Enter> until `Speed = 9600` appears.

Step 14 Select `To Directory` and press <Enter> to return to the Set-Up Directory.

The **Set-Up Directory** menu appears on the bottom of your screen:

```
Set-Up Directory                                          VT320  V1.1
 Display   General   Comm    Printer    Keyboard    Tab

 On Line   Clear Display   Clear Comm    Reset Terminal      Recall    Save

 Set-Up English              North American Keyboard            Default   Exit

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```

Step 15 To save your changes, select `Save` and press <Enter>.

When the changes have been saved, `Done` is displayed at the bottom of the menu.

Step 16 Press <Set-Up> to finish the set up and continue with the installation.

Any text that was on the screen before you entered Set-Up format appears on the screen.

Section 3

Set Up the Terminal for an Update Installation

If you are performing an update installation, confirm that the settings are set up for an update. These instructions assume the settings need to be changed.

How to use the Set–Up Menus. The set up procedure works through a series of menus; each menu contains a number of options. To select an option within a menu, press the arrow keys on the editing keypad to move to the option; when you have selected the option, it is displayed in reverse video (shown as underlined text in this document). To change a *selected* menu option, press <Enter> (***do not*** press <Return>).

Step 1

Press <Set-Up> (the third key from the left on the top left of your VT320 keyboard) to display the Set–Up directory menu.

The **Set–Up Directory** menu appears on the bottom third of your screen:

```
Set-Up Directory                                          VT320  V1.1
 Display   General   Comm    Printer    Keyboard    Tab

 On Line   Clear Display   Clear Comm    Reset Terminal      Recall    Save

 Set-Up English              North American Keyboard            Default   Exit

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```

Step 2

Select `Comm` and press <Enter>.

The **Communications Set–Up** menu appears on the bottom of your screen:

```
Communications Set-Up                                      VT320   V1.1
 To Next Set-Up      To Directory   Transmit = 9600        Receive=Transmit

  No XOFF         8 Bits, No Parity    1 Stop Bit         No Local Echo

  RS232, Data Leads Only    Disconnect, 2 s Delay            Limited Transmit

  No Auto Answerback   Answerback=                            Not Concealed
```

Step 3

Select `No XOFF` and press <Enter> until `XOFF at 64` appears.

Step 4 Select `To Next Set-Up`, and press <Enter>.

The **Printer Set-Up** menu appears on the bottom of your screen:

```
Printer Set-Up                                          VT320  v1.0
 To Next Set-Up      To Directory   Speed=4800   No Printer  to  Host

  Normal Print Mode  XOFF 8 Bits,  No Parity     1 Stop Bit

  Print Full Page    Print National Only         No Terminator
```

NOTE

This manual recommends that you install your printer and leave the printer on to document any problems that may occur during the update installation. For instructions on installing your printer, consult the *Installing and Using the LA75 Companion Printer* manual.

Step 5 Select `Normal Print Mode`, and press <Enter> until `Auto Print Mode` appears.

Step 6 Select `Speed = 4800`, and press <Enter> until `Speed = 9600` appears.

Step 7 Select `To Directory` and press <Enter> to return to the Set-Up Directory.

The **Set-Up Directory** menu appears on the bottom of your screen:

```
Set-Up Directory                                        VT320  V1.1
 Display   General   Comm    Printer    Keyboard    Tab

 On Line   Clear Display   Clear Comm   Reset Terminal      Recall    Save

 Set-Up English            North American Keyboard           Default   Exit

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```

Step 8 To save your changes, select `Save` and press <Enter>.

After saving your changes, `Done` appears at the bottom of the menu.

Step 9

Press <Set-Up> to finish the set up and continue with the installation.

Any text that was on the screen before you entered Set-Up format appears on the screen.

Section 4
Update Installation Only

Shut Down the System

If you are performing a full installation, skip this section and go on to Section 5. If you need more information on shutting down the system, see the *TC2000 System Administration Guide*.

Step 1 Log in as **root.**

Step 2 Run **df** on the filesystems / and **/usr** to determine how much free space is left on the disk. If the filesystems are approaching their limit (greater than 95% full), you should look for extraneous files that can be deleted or archived.

Step 3 Verify that the **/dev/sd0d** disk partition is large enough to hold the mini-nX file system. The partition size must be greater than or equal to 8 Mbytes. If you are unsure how to determine the size of the **/dev/sd0d** partition, call the BBN ACI Customer Service Hotline.

Step 4 Check to see if anyone else is using the system (use the **w** and **ps** commands, or ask users).

Step 5 If there are no other users, shutdown the system by typing **/etc/halt.**

If there are other users, use **/etc/shutdown** to specify the time in minutes before the system shuts down, and to send a message informing the users that the system is going to shut down.

For example, the following shutdown command causes the system to shut down in two minutes. The command also sends the message "Shutting down system for os update" to users several times before the actual shutdown.

 # /etc/shutdown -h +2 "Shutting down system for os update" ↵

Step 6

At the TEX menu, type **quit-to-dos** to return to DOS, and enter y to confirm it:

```
TEX -> quit-to-dos ↵
Please confirm: Do you wish to exit to DOS? (y or n): y
C:\TCS>
```

NOTE

It is not necessary to type the entire menu name at the TEX menus. You can type the entire name, a letter or series of letters unique to your selected option, or the menu number. This manual uses the entire name to avoid any confusion. If you type the entire name, you must include the hyphens.

Section 5

Access the 5 1/4-Inch Floppy Disk Drive

The steps in this section expose the 5¼-inch floppy drive and the TC2000 system hard disk so that you can load the media into them.

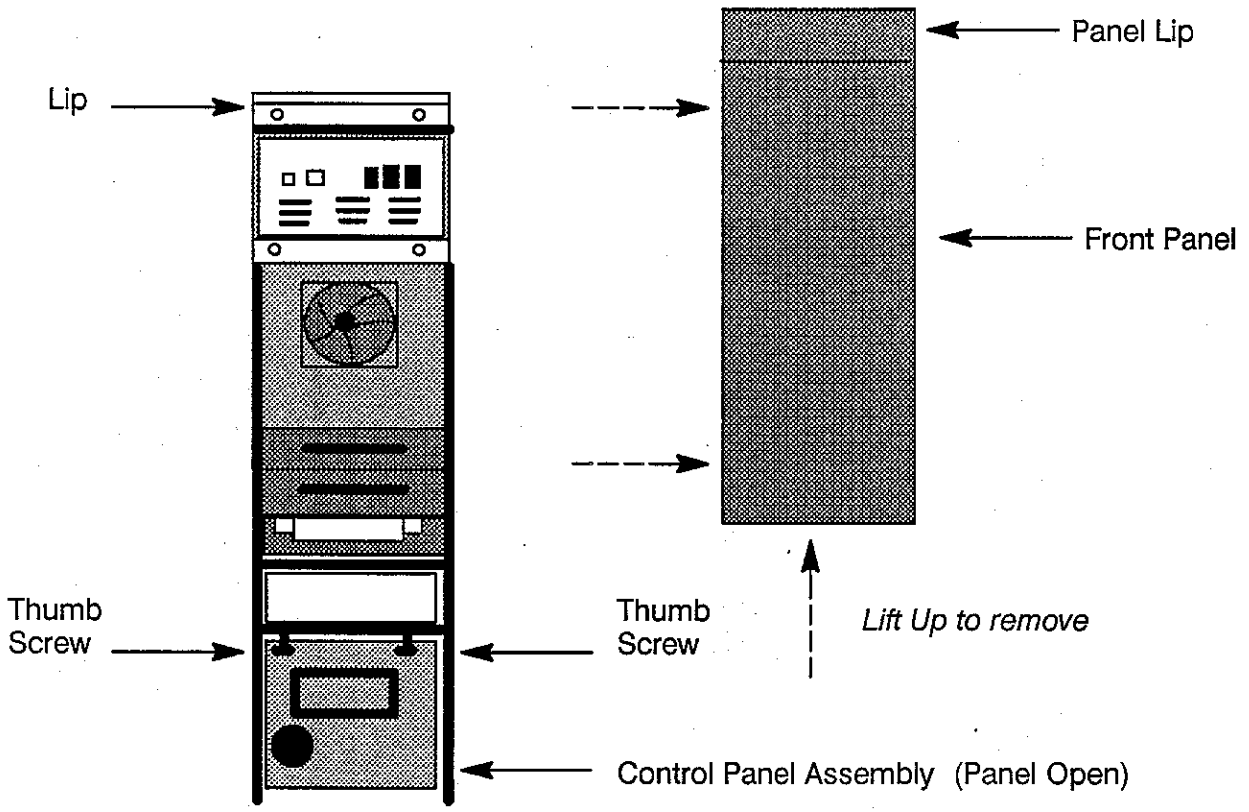
Step 1 Push the top of the door to the control panel assembly.

The door is held with a spring-release lock; pushing the top of the door releases the door from the lock.

Step 2 Unscrew the two thumbscrews at the top of the control panel assembly.

These are captive screws; they should remain in place unless you unscrew them all the way out of their housing.

Step 3 Remove the panel by lifting it straight up.



Section 6

Install the TCS Operating System

CAUTION

If site-specific changes have been made to your TCS configuration files, use the **MKDIR \TMP** command to make a temporary directory, then use the **COPY** command to backup the DOS files **autoexec.bat** and **config.sys** from the root directory (\) to **\TMP**, and **bootcfg.tcs** from the **\TCS** directory to **\TMP**.

After the installation, compare the backup files of **autoexec.bat**, **config.sys**, and **bootcfg.tcs** with the new versions installed by the software. Update the new versions as necessary.

The TCS (Test and Control System) is a subsystem separate from the TC2000 architecture, containing its own power supply, processor, and software. The TCS can control the system for diagnostic purposes and also boots the nX operating system on the TC2000 computer. The TCS software consists of an operating system (DOS), diagnostics, and the master program TEX (TCS Executive). TEX controls the TCS and runs the diagnostics. It provides power ON/OFF, reset, bootstrap, examine/deposit, TTY simulation functions, and contains routines to scan the system configuration and to report that information to the operating system software.

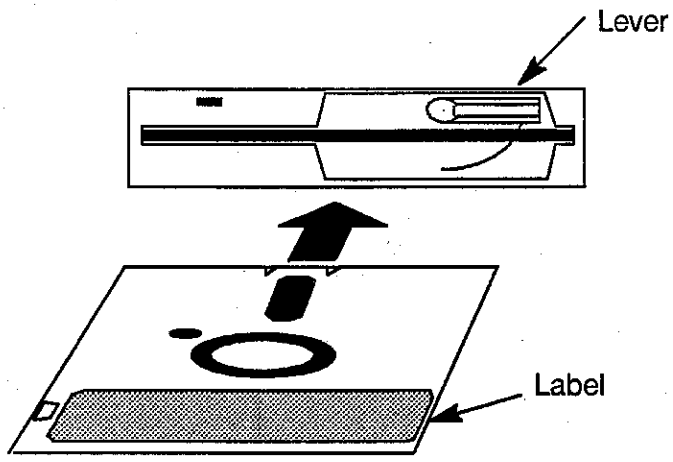
In this section, you will be installing or updating the TCS from four 5¼-inch floppy disks to the hard disk of the TC2000 TCS.

NOTE

Floppy disks are fragile, and must be treated carefully to prevent damage. ***Do not*** bend the floppy disks, place them near magnetic fields, or expose them to extreme heat.

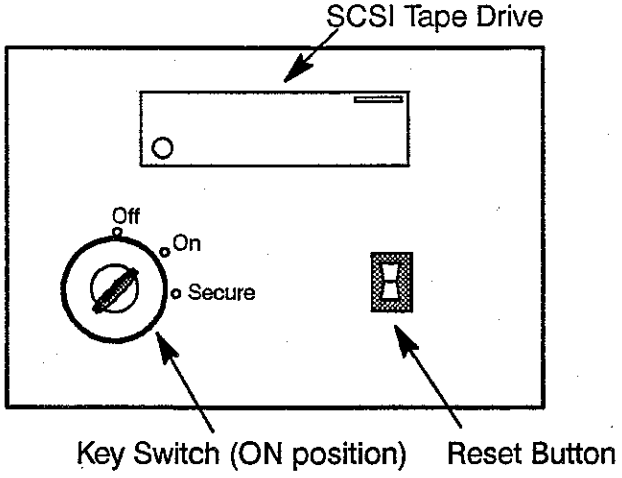
Step 1

Insert the 5¼-inch floppy disk labeled "TCS Operating System" into the floppy disk drive, and close down the lever.



Step 2

If the system is off, turn the key to the ON position. If the system is on, press the Reset button: the key must be in the ON (not SECURE) position for the Reset button to reset the machine.



The system may respond with miscellaneous messages before informing you that the TCS Operating System Installation disk is in drive A:

```
TCS Operating System Installation disk
A:\>
```

If you don't see this prompt after about 30 seconds, first make sure that you have the floppy labeled "TCS Operating System" in the disk drive. Then try rebooting the TCS by pressing the Reset button. If that fails, call the BBN ACI Customer Service Hotline for help.

NOTE

If you are updating software, skip to Step 10. You do not need to format drive C. You already formatted when you performed a full software installation.

Step 3

Type the following command to check for a volume label:

```
A:\> dir c: ↵
```

Step 4

If there is a volume label, write down the name for later reference. If there is no volume label, continue with the installation.

Step 5

Type the following command to begin the format on drive C:

```
A:\> format c: /s ↵
```

Note that a space precedes the / (slash).

Drive C is the TCS hard disk, which is located on top of the floppy drive.

Step 6

If the program doesn't request a volume label, continue with the installation.

If the program requests a volume label, enter the volume label that you recorded in Step 4 and press <Return>.

Step 7

The screen displays the following warning. Disregard the warning (there is no usable data on the TCS hard disk); enter **y** and <Return> to proceed with the format.

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!

Proceed with Format (Y/N)? y ↵
```

Step 8

Type **y** and press <Return> to proceed with the format:

```
Proceed with Format (Y/N)? y ↲
```

Formatting takes approximately five minutes. During formatting, the green light on the TCS hard disk indicates formatting, and messages similar to the following are displayed:

```
Head:     x Cylinder:     y   (for each Head x on each Cylinder y)

Format complete
System transferred

21545472 bytes total disk space
79872 bytes used by system
161792 bytes in bad sectors
21303808 bytes available on disk
```

NOTE

During formatting, if you receive the error shown below, press the Reset button. The TCS takes about 30 seconds to reboot.

```
Memory allocation error
Cannot load COMMAND, system halted
```

Step 9

Verify that the amount of disk storage lost to **bad sectors** is within disk specifications. You should lose no more than two megabytes on a twenty megabyte drive (ten percent of your total drive): 2,097,152 bytes is ten percent of a twenty megabyte drive. If you have lost more than ten percent, call the BBN ACI Customer Service Hotline.

```
21545472 bytes total disk space
79872 bytes used by system
161792 bytes in bad sectors
21303808 bytes available on disk
```

Step 10

Type **install** and press <Return> to run the installation batch file:

```
A:\> install ↲
```

Step 11

The batch file asks whether you wish to overwrite the existing TCS files on your hard disk. At the prompt, press <Return> to continue.

```
"Strike a key when ready . . . " ↲
```

The program begins copying the contents from the floppy disk to the TCS hard disk. The install script copies over existing files and makes new directories. Copying takes approximately two minutes.

Step 12 Remove the TCS floppy disk from the disk drive.

Step 13 Reboot the TCS master and load the installed TCS operating system with the following command:

```
C:\> reboot ↲
```

The system responds by displaying the TCS prompt:

```
C:TCS\>
```

Section 7

Install TCS Application Support

Step 1 Insert the 5¼-inch floppy disk labeled "TCS Application Support" into the floppy disk drive, and close the lever down.

Step 2 Change to drive A by typing this command:

```
C:\TCS> a: ↲
```

Step 3 Start the install program by typing this command:

```
A:\> install ↲
```

The program copies the contents of the floppy to the hard disk, and displays some informational messages. The directories and files take about one minute to load.

If the directories already exist, the install script prints three "Unable to create directory" messages. You can ignore these messages.

The program displays the following message when the copy operation is complete:

```
Installation of the Application Support programs is now complete.

A:\>
```

Step 4 Remove the floppy disk from the disk drive.

Section 8

Install the TCS Diagnostics

Step 1

Insert the 5¼-inch floppy disk labeled "TCS Diagnostics (1 of 2)" into the floppy disk drive, and close the lever down .

Step 2

Start the install program by typing this command:

```
A:\> install ↲
```

The program copies the contents of the floppy to the hard disk, and displays some informational messages. The directories take about one minute to load. If the directories already exist, the install script prints one "Unable to create directory" message. You can ignore this message.

The program displays the following message when copying is complete:

```
END INSTALL of Disk 1.  Proceed to Disk 2

A:\>
```

Step 3

Remove the floppy disk from the disk drive.

Step 4

Insert the 5¼-inch floppy disk labeled "TCS Diagnostics (2 of 2)" into the floppy disk drive, and close the lever down.

Step 5

Continue the installation from by typing this command:

```
A:\> install ↲
```

The program copies the contents of the floppy to the hard disk, and displays some informational messages:

```
TCS Master and Diagnostics Software Installation, Disk 2 of 2

Installing the new diagnostics from disk 2 of 2.
```

The program displays the following message when finished copying:

```
End Install of Disk 2 of 2.

C:\TCS>
```

Step 6

Remove the floppy disk from the disk drive.

Step 7

The front panel that was removed in Section 5 to gain access to the 5¼-inch floppy disk drive may now be replaced.

Section 9
Full Install Only

Format the SCSI Disk

All machines are currently equipped with a formatted disk. Use the **disktool** program to make sure that the disk is formatted correctly and that the partitions are set up.

NOTE

SCSI disks have at least two separate defect lists, primary, or manufacturer's, and grown. The primary list is generated by the manufacturer, and contains all the defects which were detected at the factory prior to shipment. It cannot be deleted or changed. The grown list contains a list of the blocks that were reassigned after the disk left the factory. Defects are added to the grown defect list whenever a block is reassigned, or when new defects are added when formatting the disk. You cannot edit the primary defect list at all. In addition, you cannot individually remove defects from the grown list, although you can delete all entries from this list. This is generally not recommended. Before you start formatting your disk, you should prepare a list of defects to add to the grown defects now on the disk, if necessary. Enter these defects prior to formatting. Do not erase the grown defect list unless you are absolutely sure you need to, because it may be difficult to restore. Refer to the *TC2000 System Administration Guide*, "Looking at Defects Tables" for a description of defect lists and how to enter them.

NOTE

Do not type on the keyboard while disktool is running. Any keys pressed while the start sequence is running, cause the program to stop. If you inadvertently type on the keyboard, type **run** and press <Return> to recover.

Step 1

Change to the **disktool** directory.

```
C:\TCS> cd \diag\disktool ↵
```

NOTE

If your primary node is not 7.7.7, you have a non-standard configuration. Change BOOTCFG.TCS before booting disktool. See Appendix A for configuration instructions.

NOTE

Make sure that the write protect switch on your TC2000 SCSI disk is in the off or zero position.

Step 2

Start the disktool program by typing the **start** command:

```
C:\DIAG\DISKTOOL> start ↲
```

The machine loads and executes the nX standalone **disktool** program.

Step 3

Select your terminal type at the Terminal Type menu, where x is your terminal type.

```
Terminal-Type-> x ↲
```

Step 4

Select **quit** when the Terminal Type menu displays.

```
Terminal-Type-> quit ↲
```

Step 5

Select **attach-to-disk 1 0** at the SCSI disktool menu.

```
SCSI disktool-> attach-to-disk 1 0 ↲
```

Step 6

The disktool program displays your selections. If your selections are correct, enter y. If your selections are incorrect, press n to enter selections again.

```
SCSI bus 1 device 0
Is this correct? (y or n) y ↲
```

Step 7

Type **fix-disk-problems format-disk begin-format** at the SCSI disktool menu to format the disk.

```
SCSI disktool -> fix-disk-problems format-disk begin-format
Format requested for disk  %s with 0 new defects.
Will format using both manufacturer's and grown defect lists.
This will take between 10 and 30 minutes, depending on the
size of the disk.
```

Step 8 Type **yes** at the begin format prompt to begin formatting:

```
Begin format? yes
Formatting disk ... done
```

Step 9 Type **yes** at the write old label back on the disk prompt:

```
Write the old label back on the disk? yes
Writing label to disk ... done
```

Step 10 Select **change–partitioning–on–label** at the the SCSI disktool menu.

```
SCSI disktool -> change–partitioning–on–label ↲
```

Step 11 Select **set–partitioning boot–disk** at the Edit Partitioning menu.

```
Edit partitioning -> set–partitioning  boot–disk ↲
```

Step 12 Select **write–partitioning–to–disk** at the Edit Partitioning menu.

```
Edit partitioning -> write–partitioning–to–disk ↲
```

Step 13 Answer **yes** at the Confirm prompt.

```
Confirm (yes or no) yes ↲
writing label to disk ...done
```

Step 14 Type `. (backprime dot) at the Edit partitioning prompt.

```
Edit partitioning -> `.
```

Step 15 At the TEX menu prompt, type **quit–to–dos** to quit.

```
TEX -> quit–to–dos ↲
```

Step 16 Answer **y** to exit to DOS.

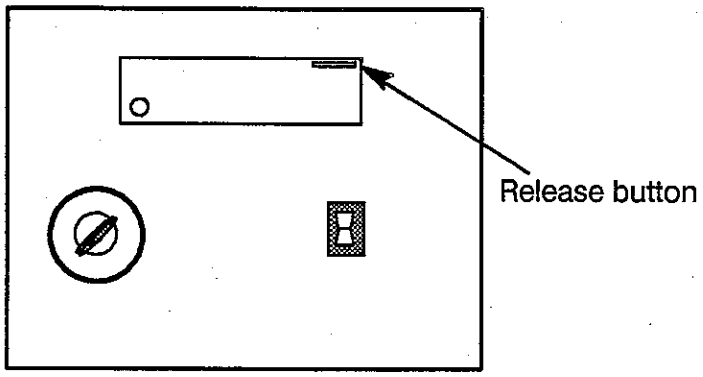
```
Please confirm:  Do you wish to exit to DOS?  (y or n): y
```

Section 10

Copy the Mini-nX Operating System

Step 1

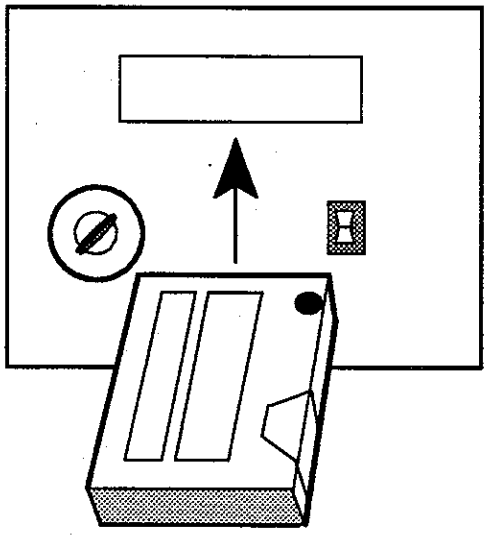
Open the SCSI tape drive by pressing the release button on the top right of the tape drive.



Step 2

Insert the tape labeled *"SCSI Stand-alone Tape"* into the system tape drive.

Insert the tape with the label facing up and the opening to the right.



Step 3

Close the tape drive door.

The green light on the lower left of the drive comes on informing you that the tape is inside and active.

Step 4

Type the following line to change to the **\diag\sacopy** directory. Note, if you are performing a full installation, your prompt is `C:\DIAG\DISKTOOL>`. If you are performing a software update your prompt is `C:\TCS>`:

```
C:\DIAG\DISKUTIL> cd \diag\sacopy ↲
```

NOTE

If your primary node is not 7.7.7, you have a non-standard configuration. Change BOOTCFG.TCS before running the stand-alone copy program (sacopy). See Appendix A for configuration instructions.

Step 5

Type **start** to load and execute the stand-alone copy program, which copies a miniature version of the operating system (mini-nX) onto the system disk:

```
C:\DIAG\SACOPY> start ↲
```

Step 6

Type **sd** to indicate the SCSI controller:

```
Disk device (xy or sd): sd ↲
```

Step 7

Type **1** to indicate SCSI bus number. For SCSI disks only:

```
Scsi bus number (0 or 1):1 ↲
```

Step 8

Type **0** at the prompt to indicate your SCSI id number:

```
Scsi id number (0-6): 0 ↲
```

Step 9

Type **d** at the prompt to indicate partition or block offset:

```
Partition or block offset: d ↲
```

Step 10

Type **y** at the prompt to confirm:

```
Copying to bus 1 unit 0, (offset 111552) Confirm? y↵
```

Loading takes approximately eight minutes. **sacopy** displays some informational messages. You can ignore these messages:

```
.................smtdriver: node 0, adap 0 bus 0 device 1 sc 0

        No Specific Info
error unloading tape, bus rv=0x34, dev rv=0x2
smtdriver: node 0, adapter 0 bus 0 device 1 sc 252
  At Filemark, At End of Tape, Truncated request, ??

Opening xt(1,0)
Copy to:

Disk device (xy or sd):
```

Note that if this fails, it will restart again automatically.

Step 11

At the disk device prompt, type `. (a backquote and a period) to return to the TCS. Note that the backquote is not displayed when you press the backquote key; it is displayed after you type the period. ***Do not*** press <Return> after you type the period.

```
Disk device (xy or sd): `.
```

Step 12

At the TEX prompt, type **quit–to–dos** to quit to DOS.

```
TEX -> quit-to-dos ↵
```

Step 13

Answer **y** to exit to DOS.

```
Please confirm:  Do you wish to exit to DOS?  (y or n): y

C:\DIAG\SACOPY>
```

Step 14

Remove the tape from the tape drive.

Section 11

Boot the Mini–nX Operating System

If you are running TEX, quit to DOS first. Then after copying the mini–nX operating system onto disk, you are ready to boot single user.

Step 1

Change to the **\tcs** directory:

```
C:\DIAG\SACOPY> cd \tcs ↲
```

NOTE

If your primary node is not 7.7.7, you have a non–standard configuration. Change BOOTCFG.TCS before booting single user. See Appendix A for configuration instructions.

Step 2

Type the following to boot mini–nX:

```
C:\TCS> boot -prompt ↲
```

You may receive a message similar to the one below. You can safely ignore this message:

```
Couldn't find file DRIVERCF.TCS.
```

Step 3

At the prompt, type **(sd1,0,3)vmunix** to boot the mini–operating system from SCSI bus 1, disk drive 0, partition d (3):

```
Boot: (sd1,0,3)vmunix ↲
```

NOTE

Press <Return> as a response to the questions in steps 4–7. **Yes** is the default to these questions.

Step 4

Type <Return> at the prompt:

```
Specify Boothowto flags[y]? ↲
```

Step 5

Type <Return> at the prompt:

```
Come up Single User[y]? ↲
```

Step 6

Type <Return> at the prompt:

```
Start KDB[y]? ↲
```

Step 7

Type <Return> at the prompt:

```
Read Machine Configuration [y]? ↲
```

The screen displays the following:

boot sequence messages
(many lines of messages)

#

Section 12

Verify the Date and Time

NOTE

You are now operating under the nX operating system rather than DOS. Under the nX operating system, the directory separator is a slash character (/), which points in the opposite direction of the DOS directory separator, the backslash character (\).

Step 1

Type **date** to see if the date and time are correct.

```
# date ↲
```

For an update, the correct date and time should already be set.

If the date and/or time is incorrect, you must reset them because any files loaded or created will be stamped with this incorrect time value.

Step 2

Use the **date** command to reset the date and/or time:

```
# date yymmddhhmm ↲
```

where,

yy is the last two digits of the year (e.g., 1989 is **89**)
mm is the month (e.g., April is **04**, November is **11**)
dd is the day
hh is the hour (on a 24–hour clock)
mm is the minutes

Do not use commas or other punctuation.

If you are using Eastern Standard Time (EST), you can skip to Section 13. The remainder of this section applies to time zones other than EST.

Step 3

By default, every TC2000 machine is set up for Eastern Standard Time (EST). If your time zone is EST, you can skip the rest of this section and continue to Section 13. If the time zone is not set up correctly, change directories to **/etc/zoneinfo**:

```
# cd /etc/zoneinfo ↲
```

The **/etc/zoneinfo** directory has a number of time zones compiled for your use, such as Singapore, Japan, Greenwich Mean Time, etc. For some countries, a directory of information exists for the different time zones within those countries. The US, Canada, and Australia directories are examples of this.

Step 4

Select the appropriate time zone for your area. Remember that the countries for which directories exist have several time zones to choose from.

Step 5

Use the **ln** command to link the selected time zone information to the file **/etc/zoneinfo/localtime.**

For example, if you select the Canada time zone Newfoundland, use the following sequence to link it to **/etc/zoneinfo/localtime:**

```
# ln /etc/zoneinfo/Canada/Newfoundland localtime
```

NOTE

If your local time zone is not listed in the directory **/etc/zoneinfo**, you should probably link the Greenwich Mean Time file that best approximates your local time zone to **/etc/zoneinfo/localtime**. If you need to generate your own time zone information, refer to the **zic(8)**, **tzfile(5)**, **ctime(3)**, and **date(1)** reference manual pages for details.

Step 6

Type the following command to change to the root directory:

```
# cd / ↵
```

Section 13
Full Installation Only

Install the nX Software

If your are updating software, skip to Section 14.

In this section, you will be loading the complete file system onto the disk using the **nxinstall** program.

WARNING

There are some selections within nxinstall that remove and/or replace data on your file system. If you have any previous data on your file system, you may want to back up your file system before continuing.

NOTE

Once you start loading the nX tape set, you have to continue until all the tapes are loaded. You should not start loading, Exit from the menus and continue later.

Step 1

Type **/etc/nxinstall** to load files from the release tapes and write them onto the disk:

```
# /etc/nxinstall ↲
```

Step 2

Type **vt320** at the prompt:

```
Enter terminal type: vt320 ↲
```

The screen clears and displays the following menu at the top of the screen (underlined text indicates reverse video):

```
Perform full install          Update existing software          Exit
```

Using the Menus. To select an option, press <Tab> until that option is in reverse video. Then press <Return> to execute that command.

Step 3

Press <Return> to select `Perform full install`.

The program clears the screen and displays the Install Software Menu:

```
Make file systems      Load "root" file system    Load "usr" file system
Load optional files                                                 Exit
```

Step 4

Press <Return> to select `Make file systems`.

The system asks you to confirm by pressing <Return>:

```
Press <Return> to confirm
```

Step 5

Press <Return> again to confirm.

The program takes several minutes to create a file system on partitions a and g, displaying messages similar to the following:

```
Making file system on /dev/sd0a.  This takes a while.
Making file system on /dev/sd0g.  This takes a while.
```

Note that making file systems on /dev/sd0g takes longer than making file systems on /dev/sd0a.

After the system creates the file systems, the screen clears and displays the main menu.

Step 6

Select `Load "root" file system` from the menu and press <Return>.

You are prompted to insert the tape marked "/ file system installation tape":

```
Insert tape marked "/ file system installation tape"
Press <Return> when ready
```

Step 7

Insert the tape labeled "/ file system"and press <Return>.

The program displays a series of messages. Some messages may overwrite other messages. The program then begins loading the file system; loading takes approximately five minutes. The screen displays the following:

```
Beginning restore of root file system.
```

After loading the files, the screen clears and returns to the main menu:

```
Make file systems       Load "root" file system    Load "usr" file system
Load optional files                                                Exit
```

Step 8

Remove the tape from the tape drive.

Step 9

Select `Load "usr" file system` from the menu and press <Return>.

NOTE

Do not enter any other keys. Doing so may cause the system to install incorrectly.

You are prompted to insert the tape marked "/ usr file system installation tape":

```
Insert tape marked "/usr file system installation tape (1 of
2)"
Press <Return> when ready
```

Step 10

Insert the tape labeled "/usr file system (1 of 2)" and press <Return>.

The program displays the following message and begins loading files. Loading takes in excess of 30 minutes.

```
Beginning load of /usr file system.
```

NOTE

Do not enter any other keys. Doing so may cause the system to install incorrectly.

After loading, the screen prompts you to enter the second tape.

```
Insert tape marked "/usr file system installation tape (2 of
2)"
Press <Return> when ready
```

Step 11 Remove the first tape.

Step 12 Insert the tape labeled "/usr file system (2 of 2)" and press <Return>.

The program displays the following message and continues loading files. Loading takes about 10 minutes.

```
Continuing load of /usr file system.
```

After loading the files, the screen clears and returns to the main menu. Any errors discovered during this sequence remain on the screen.

Step 13 Remove the tape from the tape drive.

Step 14 Select `Load optional files` and press <Return>.

```
Make file systems       Load "root" file system     Load "usr" file system
Load optional files                                                 Exit
```

You are prompted to insert the tape marked "Optional software installation tape":

```
Insert tape marked "Optional software installation tape"
Press <Return> when ready
```

Step 15 Insert the tape labeled "Optional software" and press <Return>.

The program reads the tape and displays a new set of menus. The program displays a checklist from which you select software options:

```
Make selections    Common selections    Clear selections      All selections
Install software

    [ ]                        Supplementary documentation - 3451  kilobytes
    [ ]                                  Gnu-Emacs editor - 22946 kilobytes
    [ ]                                            Games - 3225  kilobytes
    [ ]                         Manual pages (unformatted) - 8438  kilobytes
```

Make selections	Lets you make selections manually.
Common selections	Selects all menu items except Gnu-Emacs.
Clear selections	Clears all selected menu items.
All selections	Selects all menu items.

Step 16 Select `Make selections` and press <Return>.

Step 17 Select the optional files to load by pressing "X" at the appropriate line. Press <Space> to deselect and <Return> to move the cursor to the next line. Press <Escape> to return to the main menu.

Step 18 After choosing your optional software, select `Install software` and press <Return>.

```
Make selections    Common selections    Clear selections      All selections
Install software
Press "X" to select, <Space> to deselect, <Return> to get to next item. Press
<Escape> when selections complete.

    [X]                        Supplementary documentation - 3451  kilobytes
    [X]                                  Gnu-Emacs editor - 22946 kilobytes
    [X]                                            Games - 3225  kilobytes
    [X]                         Manual pages (unformatted) - 8438  kilobytes
```

The program displays the following messages and begins loading files (if you select them all, loading takes in excess of 20 minutes):

```
Beginning unload of optional files.
Loading "Supplementary documentation"
Loading "Gnu-Emacs editor"
Loading "Games"
Loading "Manual pages (unformatted)"
```

After loading the files, the screen clears and returns to the main menu.

Step 19 Remove the tape from the tape drive.

Step 20 Select `Exit` and press <Return>.

```
Make file systems      Load "root" file system    Load "usr" file system
Load optional files                                              Exit
```

The program prompts you to confirm by pressing <Return>:

```
Confirm by pressing <Return>.
```

Step 21 Press <Return> to confirm.

```
Exiting
Done with installing tapes
<blank line>
Returning to shell

#
```

Section 14
Update Installation Only

Install the nX Software

If your are performing a full software installation, skip to Section 15.

In this section, you will be updating the file system using the **nxinstall** program.

WARNING

There are some selections within nxinstall that remove and/or replace data on your file system. If you have any previous data on your file system, you may want to back up your file system before continuing.

NOTE

Once you start loading the nX tape set, you have to continue until all the tapes are loaded. You should not start loading and then Exit from the menus and continue later.

Step 1

Force a file system check of partitions **/dev/sd0a** and **/dev/sd0g** with the **/etc/fsck –f** command as follows.

```
# /etc/fsck –f /dev/sd0a ↲
# /etc/fsck –f /dev/sd0g ↲
```

Step 2

Type **/etc/nxinstall** to load files from the release tapes and write them onto the disk:

```
# /etc/nxinstall ↲
```

Step 3

Type **vt320** at the prompt:

```
Enter terminal type: vt320 ↲
```

The screen clears and displays the following menu at the top of the screen (underlined text indicates reverse video):

```
Perform full install          Update existing software          Exit
```

Using the Menus. To select an option, press <Tab> until that option is in reverse video. Then press <Return> to execute that command.

Step 4 Select `Update existing software` and press <Return>.

```
Perform full install          Update existing software          Exit
```

The program clears the screen and displays the `Update existing software` menu:

Step 5 Select `Save site specific files` and press <Return>.

```
Save site-specific files   Update "root" file system   Update "usr" file system
Update optional files      Restore site files                            Exit
```

The program prompts you to confirm by pressing <Return> a second time:

Step 6 Press <Return> to confirm.

The program saves the site-specific files in the **/usr/tmp** directory. The files take about two minutes to save.

After saving the files, the screen clears and displays the main menu.

NOTE

Do not enter any other keys until prompted. Doing so may cause the system to install incorrectly.

Step 7 Select `Update "root" file system` and press <Return>.

```
Save site-specific files   Update "root" file system   Update "usr" file system
Update optional files      Restore site files                            Exit
```

The program prompts you to insert the tape marked "/ file system installation tape":

```
Insert tape marked "/ file system installation tape"
Press <Return> when ready
```

Step 8 Insert the tape marked "/ file system" and press <Return>.

The program displays a series of messages. Some messages may overwrite other messages. The program then begins loading the file system; loading takes approximately 5 minutes. The screen displays the following:

```
Skipping dump image of root file system.
Updating root file system with tar image.
```

After loading the files, the screen clears and returns to the main menu.

Step 9 Remove the tape from the tape drive.

Step 10 Select `Update "usr" file system` and press <Return>.

```
Save site-specific files   Update "root" file system   Update "usr" file system
Update optional files      Restore site files                            Exit
```

NOTE

Do not enter any other keys until prompted. Doing so may cause the system to install incorrectly.

You are prompted to insert the tape marked "/ usr system installation tape (1 of 2)":

```
Insert tape marked "/usr file system installation tape (1 of 2)"
Press <Return> when ready
```

Step 11 Insert the tape labeled "/usr file system (1 of 2)" and press <Return>.

The program displays a loading message and begins loading files. Loading takes in excess of 30 minutes.

```
Beginning update of /usr file system.
```

NOTE

Do not enter any other keys until prompted. To do so causes the system to install incorrectly.

After loading the files, the screen prompts you to enter the second tape.

```
Insert tape marked "/usr file system installation tape (2 of 2)"
Press <Return> when ready
```

Step 12 Remove the first tape.

Step 13 Insert the tape labeled "/usr file system (2 of 2)" and press <Return>.

The program displays the following message and continues loading files. Loading takes about 10 minutes.

```
Continuing update of /usr file system.
```

After loading the files, the screen clears and returns to the main menu. Any errors discovered during this sequence remain on the screen.

Step 14 Remove the tape from the tape drive.

Step 15 Select `Update optional files` and press <Return>.

```
Save site-specific files   Update "root" file system   Update "usr" file system
Update optional files      Restore site files                          Exit
```

You are prompted to insert the tape marked "Optional software installation tape":

```
Insert tape marked "Optional software installation tape"
Press <Return> when ready
```

Step 16 Insert the tape labeled "Optional software" and press <Return>.

The program reads the tape and displays a new set of menus. The program displays a checklist from which you select software options:

```
Make selections    Common selections    Clear selections      All selections
Install software

    [ ]                        Supplementary documentation - 3451  kilobytes
    [ ]                                  Gnu-Emacs editor - 22946 kilobytes
    [ ]                                           Games - 3225  kilobytes
    [ ]                         Manual pages (unformatted) - 8438  kilobytes
```

Make selections	Lets you make selections manually.
Common selections	Selects all menu items except Gnu-Emacs.
Clear selections	Clears all selected menu items.
All selections	Selects all menu items.

Step 17 Select `Make selections` and press <Return>.

Step 18 Select the optional files to load by pressing "X" at the appropriate line. Press <Space> to deselect and <Return> to move the cursor to the next line. Press <Escape> to return to the main menu.

Step 19 When you have made your selections, select `Install software` and press <Return>.

```
Make selections    Common selections    Clear selections      All selections
Install software
Press "X" to select, <Space> to deselect, <Return> to get to next item. Press
<Escape> when selections complete.

    [X]                        Supplementary documentation - 3451  kilobytes
    [X]                                  Gnu-Emacs editor - 22946 kilobytes
    [X]                                           Games - 3225  kilobytes
    [X]                         Manual pages (unformatted) - 8438  kilobytes
```

The program displays the following messages and begins loading files (if you select them all, loading takes in excess of 20 minutes):

```
Beginning update of optional files.
updating "Supplementary documentation"
updating "Gnu-Emacs editor"
updating "Games"
updating "Manual pages (unformatted)"
```

After loading the files, the screen clears and returns to the main menu.

Step 20 Remove the tape from the tape drive.

Step 21 Restore your site-specific files with the `Restore site files` menu option.

```
Save site-specific files Update "root" file system Update "usr" file system
Update optional files    Restore site files                          Exit
```

This menu option takes the saved site-specific files and restores them over the new site-specific files. The saved site-specific files contain the information specific to your site, the new site-specific files contain the new default versions. You will be instructed in Section 19 on how to merge the saved site-specific and new site-specific files. Note that restoring site-specific files overwrites the new versions of the site-specific files.

Select `Restore site files` and press <Return>:

```
Save site-specific files Update "root" file system Update "usr" file system
Update optional files    Restore site files                          Exit
WARNING: This will overwrite the new versions of the site-specific files
Press <Return> to confirm
```

The program asks you to press <Return> to confirm and then displays the following message and begins restoring files (the files take approximately 5 minutes to restore):

```
Restoring site-specific files from /usr/tmp.
```

After the system restores the files, the screen clears and returns some messages. After confirmation, press <Return> to continue.

```
Save site-specific files  Update "root" file system  Update "usr" file system
Update optional files     Restore site files         Exit

The new versions of the site-specific files have been
overwritten.  In order to incorporate any changes in
the distributed versions of these files, it is necessary
to compare and merge with the new versions of the files.
A copy of these files is in /usr/tmp/newroot (for files
from the root file system) and /usr/tmp/newusr (for files
from the /usr file system).

Press any key to continue
```

Section 19 will describe how to merge your restored site-specific files with the new ones.

Step 22 Select `Exit` and press <Return>.

```
Save site-specific files Update "root" file system Update "usr" file system
Update optional files    Restore site files                          Exit
```

The program prompts you to confirm the selection:

```
Confirm by pressing <Return>.
```

Step 23 Press <Return> to confirm.

```
Exiting
Done with installing tapes
<blank line>
Returning to shell

#
```

Section 15

Configure TEX Dependent Files

In this section you will be making some minor changes within the TEX menus. Use care to type these commands as they appear in this section.

Step 1

Type **/etc/halt** and press <Return> to halt the machine.

 # /etc/halt ↲

Step 2

At the TEX menu, type **configuration forget.**

TEX -> **configuration forget** ↲

Step 3

At the TEX menu, type **configuration reconfigure.**

TEX -> **configuration reconfigure** ↲

Step 4

At the TEX menu, type **configuration scan medium.**

TEX -> **configuration scan medium** ↲

If the system has more than 64 nodes, type **large** instead of **medium.**

Step 5

At the TEX menu, type **configuration write slot-configuration** and press <Return> to create a Slot Configuration file:

TEX -> **configuration write slot-configuration** ↲

Step 6

At the Enter filename <String> prompt, press <Return>. SLOTCFG.TCS is the default:

```
Enter filename <String> -> (SLOTCFG.TCS) ↲
```

Step 7

At the TEX menu, type **quit-to-dos** and press <Return> to quit to DOS.

TEX -> **quit-to-dos** ↲

Step 8

Answer y to exit to DOS.

```
Please confirm: Do you wish to exit to DOS?  (y or n): y↲

C:\TCS>
```

Section 16

Boot Single User

The machine is now ready to boot single user. Follow this one step to boot single user.

If you are not in the `C:\TCS>` directory, type **cd \tcs** to change to the appropriate directory. It should be noted that this will not be a problem if you have followed these directions from the beginning.

Step 1

Type the following line to boot the nX operating system:

`C:\TCS>` **boot -single** ↵

The screen displays many messages and comes up in single–user mode:

#

Section 17

Preparing Filesystems

In this section you will be mounting **/usr** and **/tmp**. It should be noted that the actual numbers **fsck** reports vary from machine to machine. The numbers in this section are used as an example.

Step 1

Type the following to check the **/usr** partition:

 # /etc/fsck –f /dev/rsd0g ↲

The screen displays the following:

```
** /dev/rsd0g
** Last Mounted on /mnt/usr
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
6034 files,120110 used, 478920 free (584 frags, 59792 blocks,
0.1% fragmentation)
```

Step 2

Type the following to mount the **/usr** partition:

 # /etc/mount /dev/sd0g /usr ↲

Step 3

Type the following to check the **/tmp** partition:

 # /etc/fsck –f /dev/rsd0b ↲

The screen displays the following:

```
** /dev/rsd0b
** Last Mounted on /paged
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
2 files, 9 used, 10350 free (14 frags, 1292 blocks, 0.1% frag-
mentation)
```

Step 4 Type the following to mount the **/tmp** partition:

 # /etc/mount /dev/sd0b /tmp ↵

Section 18
Full Installation Only

Edit Site–Specific Files

In this section you will be editing your site–specific files. If you are updating software, skip to Section 19.

The example below uses a machine named "starship". Editing these files brings you up with the minimum configuration necessary to use your system multi user. For a more detailed configuration, see the *TC2000 System Administration Guide.*

Step 1

Change the root password by typing this command:

```
# passwd root ↵
```

NOTE

If you don't change your password, the default password prevents login as root. Failure to set your password will prevent you from halting your machine; you will have to boot up single user and set the password.

Step 2

At the prompt, type the new password and press <Return>. The password does not echo on your screen:

```
New password:
```

Step 3

At the prompt, type the new password again and press <Return>. The password does not echo on your screen:

```
Retype new password:
```

Use an editor that you feel comfortable with to edit the files in Steps 4–11.

Step 4

Edit the **/bootconf** file.

Depending on your machine's configuration size, you may want to change the number of buffers given here. Refer to Appendix B for instructions on editing your **/bootconf** file.

Step 5

Edit the **/etc/fstab** file.

Edit this file only if you have remote file systems that need mounting. This file already contains your machine's file systems. If you are mounting file systems from other machines, refer to the *TC2000 System Administration Guide* for more information.

Step 6

Edit the **/etc/group** file.

Examine this file to ensure that "root" is in group "wheel" because Yellow Pages does not know about this group. Add any users with root privileges to group "wheel"; for example,

```
wheel:*:0:root,mmdf,jsmith,ajones
```

NOTE

If you plan to have a small LAN (e.g. a network that will never access or be accessed by another network) give your Internet Protocol (IP) address a unique random number, following the pattern **xxx.x.x.x** (e.g. 129.1.1.1) . If you plan to have a WAN or a large LAN, consult the *TC2000 System Administration Guide* for more information.

Step 7

Edit the **/etc/hosts** file.

- Change ".MY.DOMAIN" in the following line to the appropriate domain server name (e.g., ".bbn.com").

```
127.0.0.1       localhost localhost.MY.DOMAIN
```

  The line is needed only by X Windows servers, and not X Windows clients, but you should keep it as a means to test proper operation of TCP/IP code.

- Add a line with your machine's IP address and name in the following format:

```
129.33.3.25   starship starship.bbn.com
```

Step 8

Edit the **/etc/hosts.equiv** file.

Remove the dummy lines "myfriendlyhost" and "yourfriendlyhost" and include the same line you added to /etc/hosts above:

```
starship
starship.bbn.com
```

Step 9

Edit the **/etc/rc.local** file.

Change the value of "hostname" from "NONAME" to your system's name (e.g. starship.bbn.com). Note that this is the minimum configuration necessary for communicating with other machines. There are other changes later as described in the *TC2000 System Administration Guide*.

```
hostname starship.bbn.com
```

Step 10

Edit the **/etc/rc** file.

Comment out this line by placing a # (pound sign) at the beginning of the line:

```
(cd /tmp; /usr/lib/ex3.7preserve -a)
```

After mail is set up you will come back here to uncomment this line, but for now it must be commented out.

Step 11

If you are doing a lot of work in the public cluster, make sure the number of nodes in the cluster is two or larger. If you are doing work in the private cluster, the number should be at least two. The default before running rc.local is one. After booting, one is added to this number.

The following lines in **rc.local** determine the number of nodes in the public cluster:

```
# Make the PUBLIC cluster (cluster ID=2) contain 1 additional node
#
/usr/bin/addnodes 1 2
```

The 1 in this command represents the number of nodes to add to the cluster and the 2 represents the public cluster ID number.

Step 12

Type the following to remove the **notconfigured** file in **/etc** (the installation procedure creates the file):

 # rm /etc/notconfigured ↵
#

Section 19
Update Installation Only

Edit Files

In this section you will be merging site-specific files. If you are performing a full software installation, skip to Section 20.

An awkward part of updating an existing software installation is the handling of files that must be specifically configured for a particular site. In general, such files should be preserved from one release of the software to the next. To avoid losing site-specific information, the update procedure works as follows:

Step 1

Copies of existing site-specific files are saved. Site-specific files from the root file system are saved in the **/usr/tmp/oldroot** directory hierarchy. Site-specific files from the **/usr** file system are saved in the **/usr/tmp/oldusr** directory hierarchy.

Step 2

The update installation is performed. This overwrites existing site-specific files with default versions from the distribution tape.

Step 3

The newly installed versions of the site-specific files are saved. Site-specific files from the root file system are saved in the **/usr/tmp/newroot** directory hierarchy. Site-specific files from the **/usr** file system are saved in the **/usr/tmp/newusr** directory hierarchy.

Step 4

The original versions of site-specific files are restored from **/usr/tmp/oldroot** and **/usr/tmp/oldusr**.

In some cases, the distributed versions of site-specific files change from one distribution to the next. For these files, an important part of the installation process is comparing the new default version of the file with the existing file and merging changes as needed.

The following set of files in the root file system are considered site-specific in the nX 3.0 distribution:

/.cshrc
/.login
/.profile
/.rhosts
/bootconf
/dev/MAKEDEV
/dev/MAKEDEV.local
/etc/INSTALLHIST
/etc/addallusrs
/etc/addusr
/etc/dumpdates
/etc/exports
/etc/fstab
/etc/ftpusers
/etc/gettytab
/etc/group
/etc/hosts
/etc/hosts.equiv
/etc/hosts.lpd
/etc/hps.conf
/etc/hpsload.conf
/etc/inetd.conf
/etc/motd
/etc/named.boot
/etc/named.ca
/etc/named.local
/etc/networks
/etc/passwd
/etc/passwd.dir
/etc/passwd.pag
/etc/printcap
/etc/protocols
/etc/rc
/etc/rc.boot
/etc/rc.local
/etc/remote
/etc/rpc
/etc/services
/etc/shells
/etc/syslog.conf
/etc/ttys
/etc/termcap

Of these files, the following subset have changed since the nX 2.0 distribution:

/bootconf
/dev/MAKEDEV
/dev/MAKEDEV.local
/etc/fstab
/etc/gettytab
/etc/passwd
/etc/rc
/etc/rc.boot
/etc/rc.local
/etc/termcap

You should do the following to merge in the changes that have been made to these files.

Step 1

Compare the site–specific files in the root file system that have changed since nX version 1.0 using the **diff** command. An example is shown below:

diff /bootconf /usr/tmp/newroot/bootconf ↲

Step 2

Make the appropriate edits to the site–specific file (*e.g.* **/bootconf**) with a text editor of your choice. Note that, if needed, copies of the original versions of the site–specific files are available in the **/usr/tmp/oldroot** directory hierarchy.

The following set of files in the **/usr** file system are considered site–specific in the nX 3.0 distribution:

/usr/adm/acct
/usr/adm/daily
/usr/adm/messages
/usr/adm/monthly
/usr/adm/shutdownlog
/usr/adm/weekly
/usr/adm/wtmp
/usr/bin/askbbn
/usr/lib/X11/xdm/Xreset
/usr/lib/X11/xdm/Xresources
/usr/lib/X11/xdm/Xservers
/usr/lib/X11/xdm/Xsession
/usr/lib/X11/xdm/Xstartup
/usr/lib/X11/xdm/xdm–config
/usr/lib/aliases
/usr/lib/crontab
/usr/lib/find/updatedb
/usr/lib/sendmail.cf
/usr/lib/uucp/L–devices

/usr/lib/uucp/L-dialcodes
/usr/lib/uucp/L.sys
/usr/lib/uucp/L.aliases
/usr/lib/uucp/L.cmds
/usr/lib/uucp/SQFILE
/usr/lib/uucp/USERFILE
/usr/man/manl
/usr/mmdf/mmdftailor
/usr/mmdf/table/aliases
/usr/mmdf/table/bboards
/usr/mmdf/table/list
/usr/mmdf/table/local
/usr/mmdf/table/mmdfdbm.dir
/usr/mmdf/table/mmdfdbm.lck
/usr/mmdf/table/mmdfdbm.pag
/usr/mmdf/table/rootdomain
/usr/mmdf/table/smtp
/usr/mmdf/table/smtpknown
/usr/mmdf/table/top
/usr/mmdf/table/top.base
/usr/mmdf/table/uucpchn
/usr/mmdf/table/uucpdom
/usr/msgs
/usr/preserve
/usr/spool

Of these files, the following subset have changed since the nX 2.0 distribution:

/usr/adm/daily
/usr/adm/weekly
/usr/lib/X11/xdm/Xresources
/usr/lib/X11/xdm/Xservers
/usr/lib/X11/xdm/Xsession
/usr/lib/X11/xdm/xdm-config

You should do the following to merge in the changes that have been made to these files.

Step 1

Compare the site-specific files in the **/usr** file system that have changed since nX version 1.0 using the **diff** command. An example is shown below:

diff /usr/adm/daily /usr/tmp/newusr/adm/daily ↵

Step 2

Make the appropriate edits to the site-specific file (*e.g.* **/usr/adm/daily**) with a text editor of your choice. Note that, if needed, copies of the original versions of the site-specific files are available in the **/usr/tmp/oldusr** directory hierarchy.

And finally, when you have completed your site-specific file edits, perform the following step:

Step 3

Type the following to remove the **notconfigured** file in **/etc** (the update procedure creates the file):

 # rm /etc/notconfigured ↵

Section 20

Install the Patch Tape and Boot Multi User

Step 1

Install the patch tape by following the procedure described in the *nX 3.0.X Patch Tape Release Notes*.

Step 2

As part of installing the patch tape, you should have rebooted the system. If not, now type **/etc/reboot** to bring the machine up multi user:

```
# /etc/reboot ↵
```

boot sequence messages
(many lines of messages)

```
login:
```

Step 3

Login as root.

Section 21

Install nX Diagnostics

Step 1

Insert the 1/4" cartridge tape labeled "nX Diagnostics Tape" into the SCSI tape drive.

Step 2

Type the following command to change to the root directory:

 # cd / ↲

Step 3

Type the following command:

 # tar xvpf /dev/rsmt1 ↲

The filenames on the tape echo onto your screen, followed by the system prompt:

#

Step 4

Remove the tape from the tape drive.

Section 22

Install Xtra

If you have purchased the optional Xtra programming environment, follow the steps in this section to install the software.

Step 1 Log in as root to the TC2000 system on which Xtra is to be installed.

Step 2 Insert the 1/4" cartridge tape labeled "TC2000 Xtra" into the SCSI tape drive.

Step 3 Type the following command to change to the root directory:

```
# cd / ↲
```

Step 4 Unarchive the Xtra installation script:

```
# tar xvpf /dev/rsmt1 ↲
```

Step 5 Remove the tape from the tape drive.

Section 23

Install Fortran

If you have purchased the optional TC2000 Fortran distribution, follow the steps in this section to install the software. For further information about Fortran, see the *TC2000 Fortran Release Notes.*

Step 1

Insert the 1/4" cartridge tape labeled "TC2000 Fortran–77" into the SCSI tape drive.

Step 2

Type the following command to change to the root directory:

```
# cd / ↲
```

Step 3

Type the following command to unarchive Fortran:

```
# tar xvpf /dev/rsmt1 ↲
```

The filenames on the tape echo onto your screen, followed by the system prompt:

```
#
```

Step 4

Remove the tape from the tape drive.

Section 24

Configure the Operating System

After the nX operating system is up and running you need to perform a number of administrative tasks. See the *TC2000 System Administration Guide* for further instructions on configuring your system.

Step 1 Create the passwords for **operator**, and **bbnm**

Step 2 Configure terminal lines: **/etc/ttys**

Step 3 Edit **/etc/rc.local**

Step 4 Configure networking related files (e.g. **/etc/named.**)

Step 5 Edit **/etc/motd**

A

Changing BOOTCFG.TCS

This section describes the process for changing the BOOTCFG.TCS file. Change this file only if the primary node is not 7.7.7. If your primary file is not 7.7.7, you should change the version of this file multiple times: before **diskutil** or **disktool**, before **sacopy**, and before **booting** (single user and multi user).

Changing the BOOTCFG.TCS file requires that you edit with edlin, the DOS line editor. This section describes the short procedure. Should you need further assistance see the *DOS User's Guide*.

NOTE

This Appendix uses a sample file. The file you are changing and the TCS prompt may not look exactly like the sample this appendix uses, although there are undoubtedly many similarities. This is only a sample to guide you in changing the BOOTCFG.TCS file.

All machines are shipped with a standard configuration; this means that the primary node is in bay 7, midplane 7, node 7 (*i.e.*, physical node 7.7.7). If you have a non–standard configuration, you must change all instances of the file BOOTCFG.TCS to the correct primary node number. Copy and save the original BOOTCFG.TCS file, before making any changes. Do not copy the file to **bootcfg.bak**. Some editors place backup files into **.bak** files.

Section 1

Using a Non-Standard Configuration

This section explains how to change the configuration for a non-standard machine. To edit the BOOTCFG.TCS file you must use edlin. These instructions explain this procedure.

Note that there will be three different prompts: `C:\TCS>`, `C:\DIAG\DISKUTIL>` or `C:\DIAG\DISKTOOL>`, and `C:\DIAG\SACOPY>`.

Using a Non-Standard Primary Node

Step 1 Type **edlin BOOTCFG.TCS** and press <Return> to enter the editor and begin editing.

Note, an asterisk (*) is edlin's prompt:

C:\TCS> **edlin BOOTCFG.TCS**

End of input file

Step 2 Type **p** at edlin's prompt to page through the file 23 lines at a time.

***p** ↵

```
1: # BOOTCFG.TCS file for primary node at 7.7.7, with auto boot.
2: bootparam: 0: 0
3: bootparam: 1: 5
4: bootstring: (sd1,0,0)/vmunix
5: autoboot: Yes
6: primaryclock: a
7: primarynode: 7.7.7
8: switchfreq: 38
9: ubootfile: uboot.88
10: postfile: post.88
11: bootfile: boot.88
12: alternatepaths: A: Yes
13:*; End of BOOTCFG.TCS
*
```

Step 3 Change your machine's node number. In the example file, lines 1 and 7 are the lines that need to be changed. First edit line 1. Type **1** and press <Return>.

```
*1 ↲

1: *# BOOTCFG.TCS file for primary node at 7.7.7, with auto
   boot
```

Step 4 Retype the line as shown below and press <Return>. Note that in the example the primary node number is 7.1.7. Your number should be the primary node number of your machine.

```
1: *# BOOTCFG.TCS file for primary node at 7.1.7, with autoboot ↲
```

Step 5 Now edit the primarynode line, in this case line 7. Type 7 and press <Return>.

```
*7 ↲

7: *primarynode: 7.7.7
```

Step 6 Retype the line as shown below and press <Return>. Note that in the example the primary node number is 7.1.7. Your number should be the primary node number of your machine.

```
7: primarynode: 7.1.7 ↲
```

Step 7 Type **1p** and press <Return> to confirm your edit.

```
*1p ↲

1: # BOOTCFG.TCS file for primary node at 7.1.7, with auto          boot.
2: bootparam: 0: 0
3: bootparam: 1: 5
4: bootstring: (sd1,0,0)/vmunix
5: autoboot: Yes
6: primaryclock: a
7: primarynode: 7.1.7
8: switchfreq: 38
9: ubootfile: uboot.88
10: postfile: post.88
11: bootfile: boot.88
12: alternatepaths: A: Yes
13:*; End of BOOTCFG.TCS
```

Step 8 Type **e** and press <Return> to save your changes, end editing and return to TCS.

```
*e ↲
```

Step 9 You are finished configuring BOOTCFG.TCS; continue with the installation.

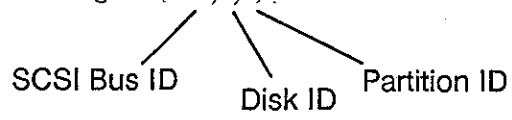
Using a Non-Standard System Disk Configuration

Step 1 At the TEX menu, type **configuration set boot-string**.

```
TEX -> configuration set boot-string ↲
```

Step 2 At the Enter filename string menu, type **(sd1,0,0)vmunix** for a SCSI disk. This is the default boot string.

```
Enter filename <String>->(sd1,0,0)vmunix
```



Step 3 At the TEX menu, type **configuration write boot-configuration**.

```
TEX -> configuration write boot-configuration ↲
```

Step 4 At the Enter filename <String> prompt, press <Return>. BOOTCFG.TCS is the default:

```
Enter filename <String> -> (BOOTCFG.TCS) ↲
```

B

Editing /bootconf

You should edit **/bootconf** if you have specific configuration parameters for the kernel that are different from the default parameters. For example, you use **/bootconf** to:

- Specify the number of simultaneously accessible I/O buffers.
- Specify the size of the interleaved memory pool.
- Define node specific information
  - Whether to place a node in the public cluster.
  - Whether to allow a node to contribute to the interleaving pool.
  - Whether to load the nX operating system onto the node or leave it "bare" so that it may be used for other execution environments, such as pSOS^{+m}.
  - The I/O bus number associated with the node (by default, the master node is associated with iobus 0).

The following three sections describe the necessary keywords you need to set-up for **/bootconf**. Use your favorite text editor to edit the file.

B.1 Define /bootconf Version Number

Currently, two versions of **/bootconf** are supported. The first is for files without a *version* keyword, where all numbers are specified in hexadecimal, and node numbers are specified via their 9-bit hexadecimal representation.

The second format is for **/bootconf** files that start with *version 1*. In these files, the default numeric base is decimal, and hexadecimal numbers may be specified with a leading 0x. Node numbers may also be specified in dotted octal format. Note that **/bootconf** can accept numeric values in three formats, de-

pending on the requirements: as a three digit octal number, *[0–7].[0–7].[0–7]*, as a hexadecimal number, *0x[0–9a–f]*, or as a decimal number.

NOTE

These are the only two versions of the **/bootconf** file supported. Setting a version number to anything other than 1 will still work, but may be incompatible with future releases.

B.2 Define Node Specific Info

You can specify node–specific information by typing **node** followed by keywords (on the same command line) to perform what you need (as described in the Section B.2.2, "Define System Loading" and Section B.3, "Define nX Buffer Cache Address Space"). If you wish to define more than one specification for a particular node, you should enter the **node** keyword and its associated card address or physical node number on one line.

B.2.1 Node Specific Definition Formats

/bootconf assumes that after a **node** keyword specification, subsequent lines describe it. This is true until either before the end–of–file or until the next **node** keyword specification. You should indent the lines describing the **node** for ease of following the descriptions. For example:

```
node 7.1.7
   iobus 2
```

This example says node 7.1.7 is given the I/O bus number 2. Refer to the following three sections for descriptions of the **iobus**, **buffers**, and system loading **/bootconf** parameters.

B.2.2 Define System Loading

To control how system nodes should be booted up (such as with the nX operating system, pSOS^{+m}, or reserved for stand–alone operations or VMEbus capability) you use the keyword **node** followed by the physical node number, followed by one of the following additional keywords:

bare or none	reserves that node for pSOS^{+m} or stand–alone operation
nX	reserves that node for the nX operating system

You can also simply enter one of these keywords on a line separate from its node, but before the next **node** keyword specification.

B.2.3 Public cluster configuration

A node may be placed in the public cluster by using the **public** keyword in the **bootconf** file. This allows specific physical nodes to be placed in the public cluster at boot time. If the master node is designated as a public node, it has the added effect of preventing the creation of the **I/O** cluster. This cluster can be created manually if needed, though the master node can never move once placed in the public cluster.

B.2.4 Interleaved Memory Pool Contribution

By default, if interleaving is configured, all nodes contribute to the interleaved memory pool. Specific nodes may be prevented from contributing by using the keywords **interleave none** in the **bootconf** file. This is usually a good idea for the master node, since extra demands are already placed on its physical memory. It is also very worthwhile to use this feature to cause a prime number of nodes to contribute to the interleaved memory pool. A prime number of memories gives the best results for interleaved memory performance. If a prime number of memories are not configured, the system will print a warning at boot time, but will still operate.

B.2.5 Assign iobus Numbers

An I/O bus number assigned through the **/bootconf** file indicates that that node has an I/O device attached to it. You assign I/O bus numbers with the keyword **iobus**. Only TC/FPV nodes can have I/O bus numbers assigned to them, and this only when there is an I/O device/controller attached to that node. Any TC/FPV node with an attached I/O device/controller must have an I/O bus number assigned to it. This is any number from 0 to 31 that has not already been assigned to an I/O node. Note that up to 32 TC/FPV nodes can be designated as I/O nodes. An example of a **/bootconf** file with assigned bus numbers is:

```
version 1
buffers 200
node master
   iobus 0
node 7.6.7 iobus 1
node 7.7.0 iobus 2
node 7.7.1 iobus 3
```

B.3 Define nX Buffer Cache Address Space

The new nX buffer cache now does buffer memory allocation dynamically. The **bootconf** file buffers specification now controls the amount of kernel virtual address space set aside for concurrently active buffers. So

```
buffers 100
```

indicates that enough virtual address space should be reserved so that 100 buffers can be active at the same time. This should be set to the number of processes that will be doing I/O simultaneously.

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To do a better job of serving you by providing improved documentation, we are asking you to help us. Please take a few minutes to answer the following questions and return them to us by folding up and taping this questionnaire. We value your comments and suggestions and appreciate the time you take to send them to us. Thank you.

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2. How many years have you been working with computer systems? _____

3. What system are you currently working on? (please check both **hardware** and *software*) ☐ **GP1000** ☐ **TC2000** ☐ *Mach 1000* ☐ *pSOS 1000* ☐ *nX* ☐ *pSOS+m*

4. What application are you using the product for? _____

5. How much of your time do you spend reading or referring to documents? ☐ 10% ☐ 20% ☐ 30% ☐ 40% ☐ 50%

Please answer the following questions about: Software Installation Guide

6. Is the information accurate? ☐ always ☐ mostly ☐ seldom ☐ never

7. Is the material clear and logical? ☐ always ☐ mostly ☐ seldom ☐ never

8. Is it easy to find the information you need? ☐ always ☐ mostly ☐ seldom ☐ never

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