

FISHER-ROSEMOUNT

RS3™

**Trend
Resource Unit
(TRU) Manual**

**Performance Series 1, Release 3.3
and
RS3 Software Version 18**

**July 1999
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1984-2651-2101

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Trend Resource Unit (TRU) Manual

About This Manual

The version number for this release of TRU software is P1.02.

The TRU performs the trending functions that were available with the SRU on Version 18 systems. Users with P1 systems will see only the TRU commands. Users with Version 18 systems will find that functions previously supported on the SRU (including Statistical Quality Control, Material History, SRU Batch, SRU Reporting, and SRU Alarming) still appear on the command line. However, these functions are no longer supported and users should not attempt to use them. On Version 18 systems, the functionality that is supported by the TRU will use the same commands as the SRU. P1 system users will see the commands labeled as TRU.

The TRU backs up only the folders it supports, therefore, before you upgrade a system from SRU to TRU, you must back up and delete the following folders from the SRU:

- Reports
- RBL Files
- Log Files
- Batch Tasks
- ABC Data
- ABC Log
- ASCII Files
- Process Symbols
- Process Graphics

Figure i. Disk Folder Configuration Screen, highlights the folders that are not supported in TRU but are shown on the Disk Folder Configuration screen. The maximum number of files and the size in K bytes are both configured at zero. These folders are not supported and you should not attempt to access or configure them.

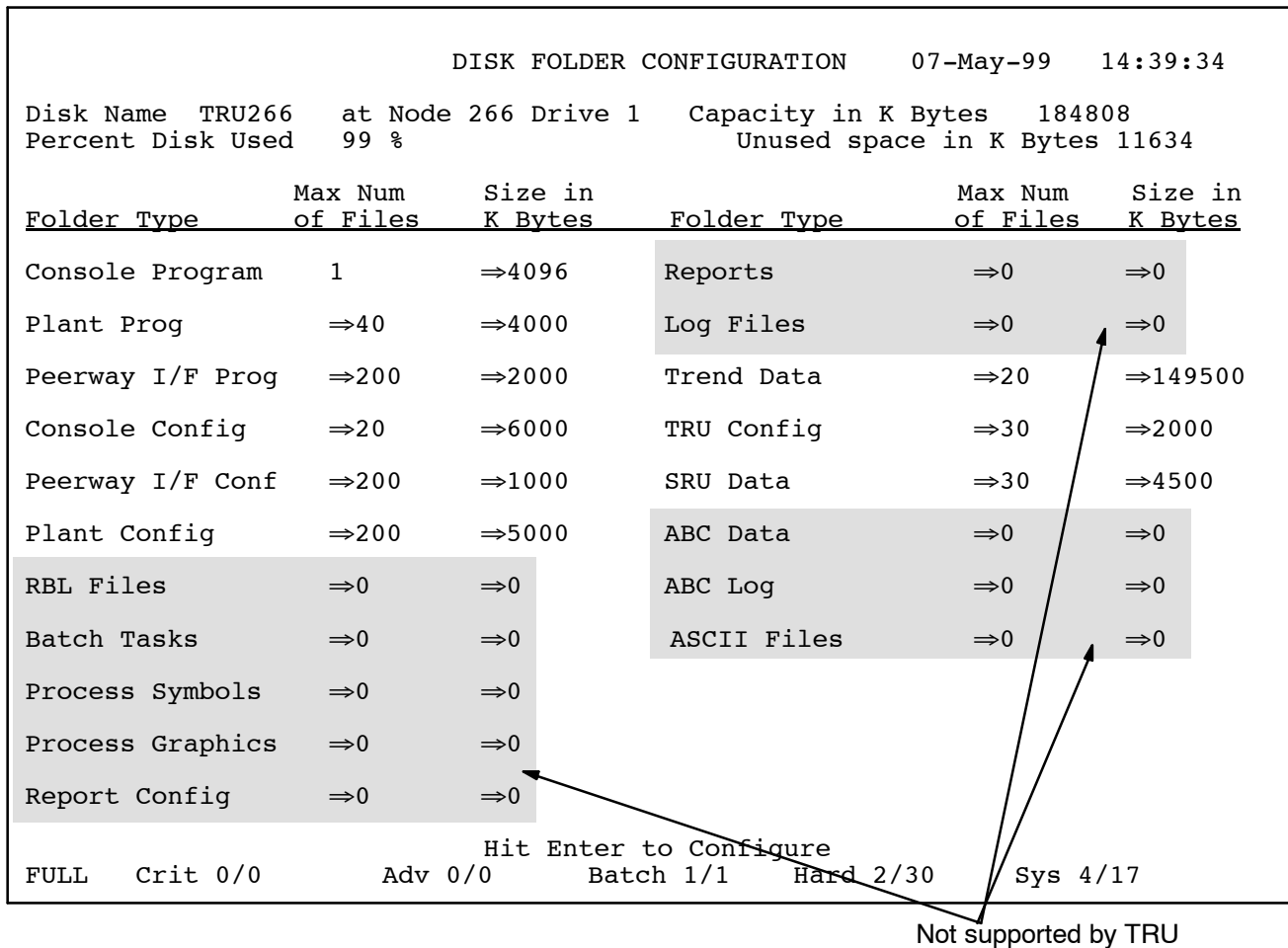


Figure i. Disk Folder Configuration Screen

If you attempt to access a function that is not supported on TRU, a warning message, a disk event list, or an alarm will be displayed.

V18 Message	P1 Message
?224	TRU does not support batch
?227	TRU does not support reports
?248	TRU does not support graphics

NOTE: If you attempt to perform a batch operation on a TRU, a system alarm will be sent saying “This operation is not allowed on a TRU” on P1 systems or “VAX 07” on V18 systems.

References to Other Manuals

References to other RS3 user manuals list the manual, chapter, and sometimes the section as shown below.

Sample Entries:

For ..., see CC: 3.

Manual Title Chapter

For ..., see CC: 1-1.

Manual Title Chapter-Section

Abbreviations of Manual Titles

AL = Alarm Messages
CB = ControlBlock Configuration
CC = Console Configuration
DT = Disk and Tape Functions
IO = I/O Block Configuration
OP = Operator's Guide
OV = System Overview and Glossary
PW = PeerWay Interfaces
RI = RNI Installation Guide
RP = RNI Programmer's Reference Manual
RN = RNI Release Notes
SP = Site Preparation and Installation
SV = Service

Reference Documents

Prerequisite Documents

You should be familiar with the information in the following documents before using this manual:

<i>System Overview Manual and Glossary</i>	1984-2640-18x1
<i>Performance Series 1 Software Release Notes</i>	10P56870108
<i>Performance Series 1 Software Loading and Upgrade Procedures</i>	10P56870208

Related Documents

You may find the following documents helpful when using this manual:

<i>Alarm Messages Manual</i>	1984-2657-19x1
<i>Configuration Quick Reference Guide</i>	1984-2812-0808
<i>Console Configuration Manual</i>	1984-2643-21x0
<i>ControlBlock Configuration Manual</i>	1984-2646-21x0
<i>I/O Block Configuration Manual</i>	1984-2645-21x0
<i>Operator's Guide</i>	1984-2647-19x1
<i>PeerWay Interfaces Manual</i>	1984-2650-21x0
<i>RNI Programmer's Reference Manual</i>	1984-3356-03x1
<i>RNI Installation Guide</i>	1984-3357-0301
<i>RNI Release Notes</i>	10P574830x1
<i>Service Manual, Volume 1</i>	10P569802x1
<i>Service Manual, Volume 2</i>	10P569802x2
<i>Service Quick Reference Guide</i>	10P57000201
<i>Site Preparation and Installation Manual</i>	10P569902x1
<i>Software Discrepancy Notes for Performance Series 1</i>	10P56870306
<i>User Manual Master Index</i>	1984-2641-21x0

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Section 1: TRU Hardware

The Trend Resource Unit (TRU) provides additional computing power for trending. The TRU contains a card cage, circuit cards, a cooling fan, and one or two disk drives. Each disk drive provides 80 megabytes of available disk space.

The card cage houses the following circuit cards:

- OI Processor 68020 card (1984-1540-0009)
 - Power Regulator card (1984-1137-000x)
 - PeerWay Interface card (1984-1045-000x)
 - Printer Interface card (1984-1011-000x)
 - Hard Disks (2)
 - SCSI Host Adapter (1984-1140-000x)
- or
- SCSI Board 2 (1984-3301-0001)

The Disk Shutdown (DS) command should always be performed before powering down the TRU. This will purge the cache and prevent possible loss of data.

Figure 1.1.1 shows the front of the TRU. Figure 1.1.2 shows the connections on the back.

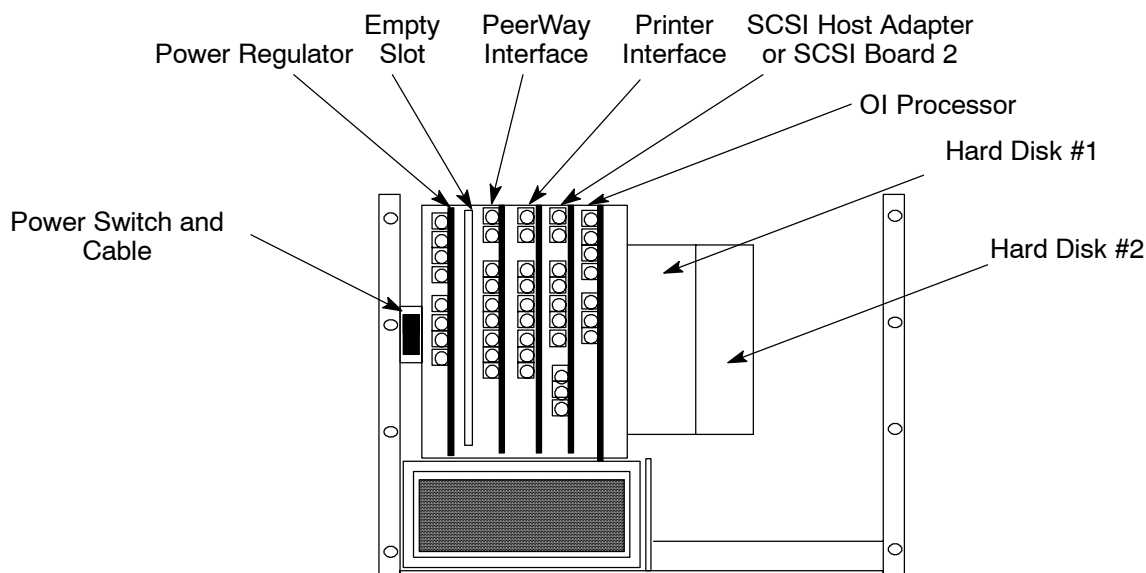


Figure 1.1.1. Trend Resource Unit (Front)

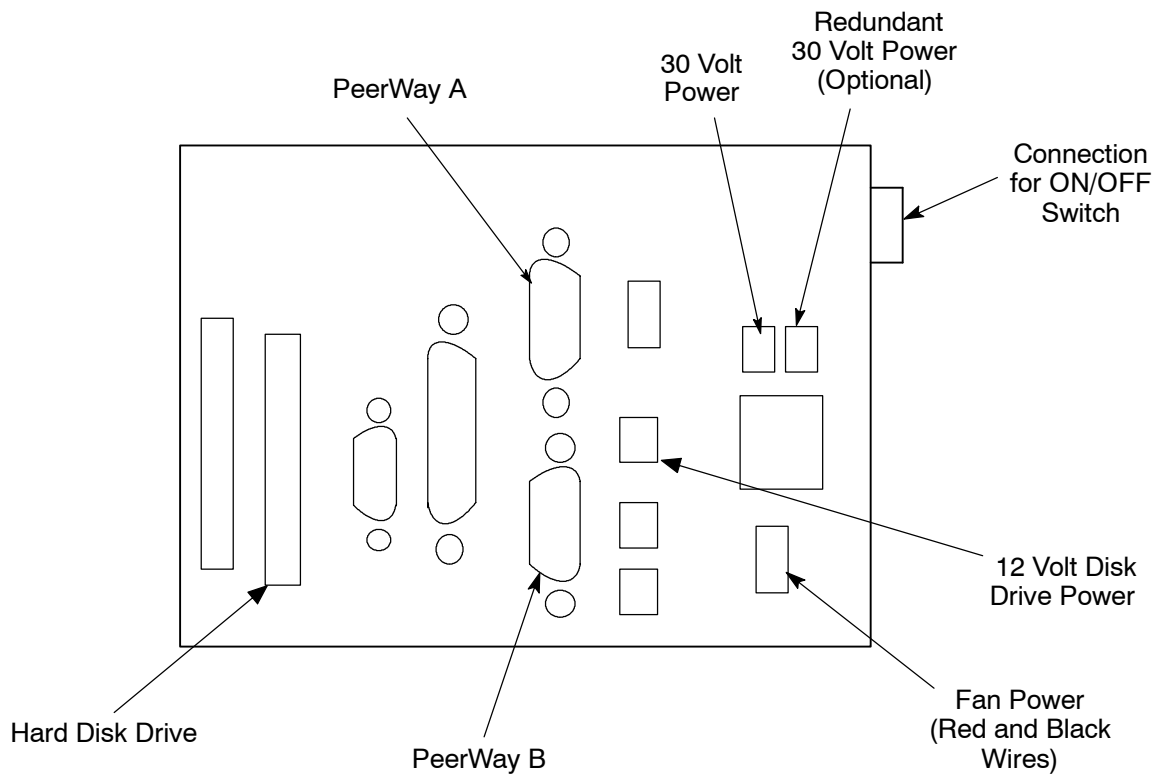


Figure 1.1.2. Trend Resource Unit (Back)

Hard disk #1 must have the SCSI address set to 5. Hard disk #2 must have SCSI address 6 and must have the three SCSI bus terminating resistors removed.

Figure 1.1.3 shows that the TRU is a PeerWay-resident device that has access to console nodes on the PeerWay. As a PeerWay device, the TRU is assigned a node address and appears as a node on the Plant Status screen.

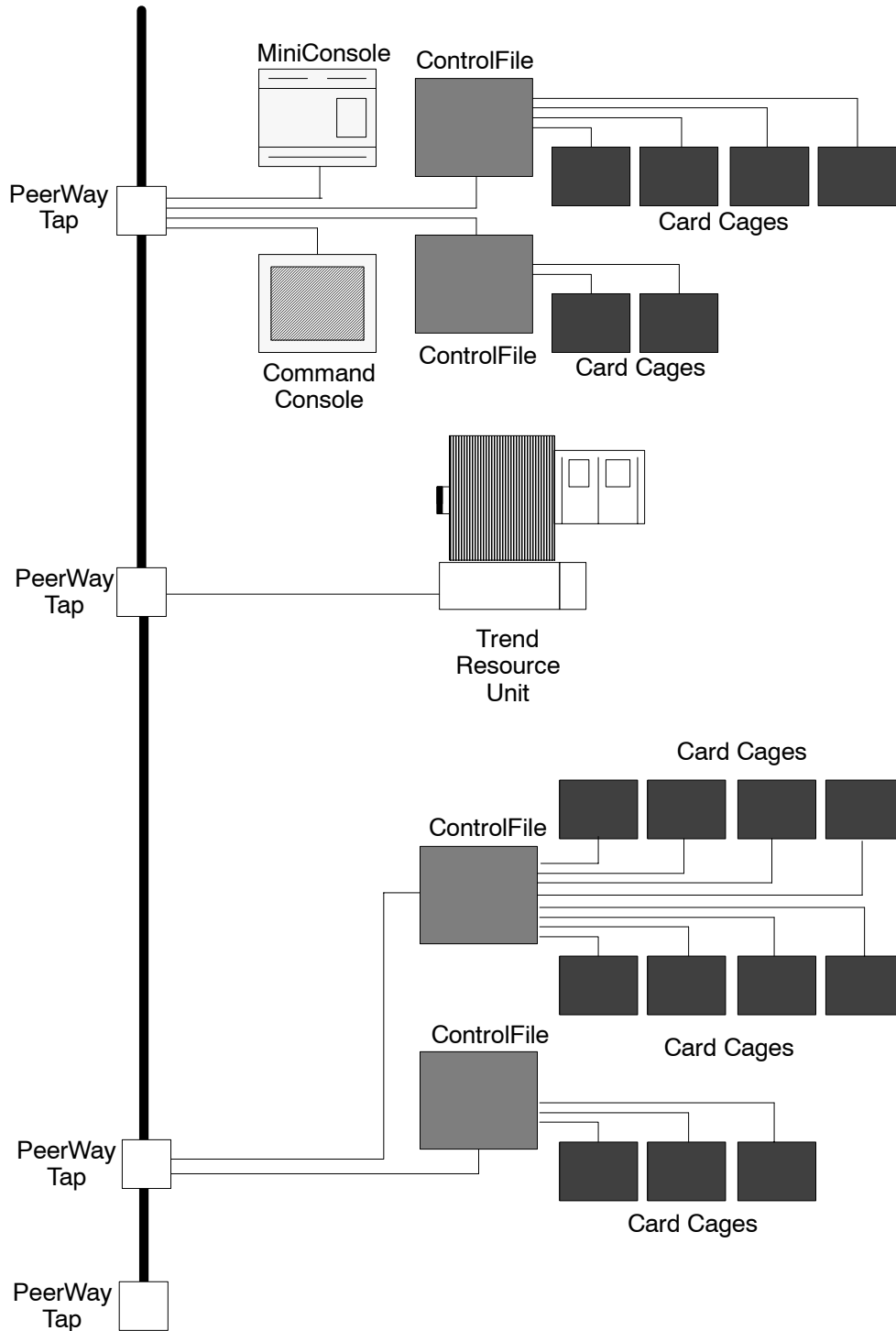


Figure 1.1.3. System Architecture, Incorporating a Trend Resource Unit

Section 2: TRU Folders and Files

This description of TRU software discusses the folders and files that reside on the TRU disk and the directories you use to access those folders and files.

The TRU folders and files are stored on one or two hard disks. A TRU with a single hard disk has 80 megabytes of available space, and a TRU with two hard disks has 160 megabytes. If the TRU has two hard disks, configure them as one large disk.

The TRU backs up only the folders it supports, therefore, before you upgrade a system from SRU to TRU, you must back up and delete the following folders from the SRU:

- Reports
- RBL Files
- Log Files
- Batch Tasks
- ABC Data
- ABC Log
- ASCII Files
- Process Symbols
- Process Graphics

If you attempt to access a function that is not supported on TRU, a warning message, a disk event list, or an alarm will be displayed.

Folders and Files Initially Residing on the TRU Disk

The following folders and files reside on the TRU disk initially. You can store other folders there as well.

- TRU Configuration Folder
 \$TNC—TRU trend configuration file
- Trend Data Folder
 Table 1.2.1 lists the file name, sampling frequency, and numbers of the trend data files.

Table 1.2.1. Trend Data Files

Filename	Sampling Frequency	File No.
1hour	1 hour intervals	1
10min	10 minute intervals	2
1min	1 minute intervals	3
5sec	10 second intervals	4

Accessing and Using the TRU Disk

You must access the TRU disk via a console node (Version P1R3.3 or greater or V18R4.1) because a TRU is a node without a CRT. At a console CRT, you can access the TRU disk via two disk directory screens that allow you to access the TRU folder directories listed in Table 1.2.2.

Table 1.2.2. TRU Directory Screens

Screen	Description
Disk Directory PeerWay screen for the PeerWay	Displays the TRU node on which the TRU data is located
Disk Directory screen for the TRU node	Displays the TRU folders currently residing on the TRU disk
TRU Config Directory screen for the TRU Configuration Folder	Displays the TRU trend configuration files

TR : 1-2-4

Section 3: Checking the TRU Subsystem Status

The TRU Status Display screen shows the status of the TRU trending subsystem. This screen is for display only; you cannot make entries from it.

☐ **To call up the Trend Node Status screen, type:**

TNS [ENTER]

NOTE: On V18 systems type: **SRS** [ENTER] (The screen will not match the one shown in Figure 1.3.1 for P1 systems.)

Figure 1.3.1 shows a sample TRU Status Display screen and how to determine whether a TRU subsystem is disabled or enabled.

Table 1.3.1 describes the types of information provided in the screen areas.

TRU STATUS DISPLAY				07-May-99	12:36:35
Node :266 (Node 10 on Peerway 9)		Program Vers 7.04		Boot Vers 9.18	
68040 Statistics					
Idle Time	76795	Trend Disk Stat		Cache disable 0	
CPU HOG task	50C982	Disk task busy	0	Disk R/W Stats	0
CPU HOG rts	262F6	Disk time	40	Write Time (MS)	0
CPU HOG pc	268CA	Disk backlog	0	Write Time (MS)	0
CPU HOG time	220	Disk kick	0	Run Status	
TRU Disk Cache		Disk header	1	Trend Disabled 0	
Attempt	2109	File lock	1	↑	
Hits	2110	Trend Comm			
% Hits	100.0	Controller msg	1		
Collisions	1	Message time	72		
% Used	100.0	Send task busy	0		
% Clean	99.7	Recv task busy	0		
% Dirty	0.3	32bit packets	12		
Trend Control		16bit packets	0		
Number points	12	Trend Hist Stat			
Reset ?	0	History time	43		
Config ?	0	Cache attempts	2607		
Pausing ?	0	Cache hits	2294		
Ready ?	1	Collisions	0		
		Hit rate	879		
FULL	Crit 0/0	Adv 0/0	Batch 1/1	Hard 0/23	Sys 1/8

0 indicates that the subsystem is enabled

Figure 1.3.1. P1 TRU Status Display Screen

Table 1.3.1. TRU Status Display Screen Field Descriptions

Field	Description
68040 Statistics	Displays information about the central processor unit. Indicates the amount of idle time remaining during an evaluation cycle.
TRU Disk Cache	Displays information about the temporary storage area for the TRU disk.
Trend Control	Displays the number of links being trended and the selected trend control options. A 0 indicates a feature that is not selected and a 1 indicates a feature that is selected.
Trend Disk Stat	Displays the status of the portion of the disk that is being used for trending.
Trend Comm	Displays information about the trending communications.
Trend Hist Stat	Displays historical information about the trending status.
Disk R/W Stats	Displays in milliseconds the amount of disk read and write time.
Run Status	Displays whether trending is disabled or enabled. A status of 0 indicates the function is enabled. A status of 1 indicates function is disabled.

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Section 1:

Installing the TRU Hardware

This section describes how to install the TRU hardware. To install a TRU card cage:

- Set the node address jumpers on the PeerWay Interface card
- Set the TRU node boot jumpers on the TRU Processor card
- Install the circuit cards

Setting Node Address Jumpers

Because a TRU resides on the PeerWay, it requires a unique node address. The TRU node address jumpers reside on the PeerWay Interface card (1984-1045-000x). Like consoles, a TRU must have an even-numbered node address. For more information on console node address jumper positions, see Appendix A, pages A-2 through A-6.

Setting TRU Node Boot Jumpers

The TRU node boot jumpers indicate whether the TRU is to boot from the TRU disk or from a different node on the PeerWay. In most cases the TRU is configured to boot from the TRU. If, however, the disk image is bad or corrupted, or the disk fails, you can boot the TRU from the PeerWay.

If the PeerWay boot is enabled, the TRU node boots from another node on the PeerWay that has the SRUBOOT file residing in the Console Program folder. If the PeerWay boot is disabled, the TRU node boots from the TRU disk. Figure 2.1.1 shows the location of the movable jumper positions on the OI Processor 68020 Card 1984-1540-0000. Table 2.1.1 gives the TRU node boot jumper positions. HD1, 2, and 6 are hardwired.

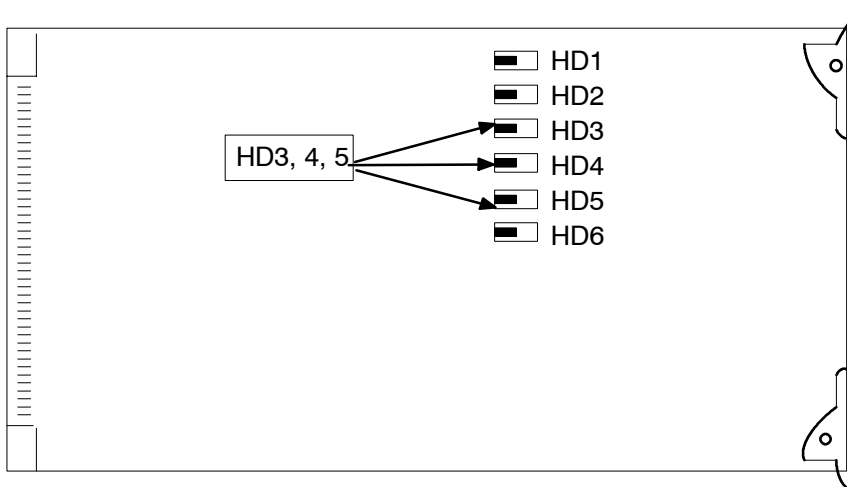


Figure 2.1.1. TRU Node Boot Jumper Positions on the OI Processor 68020 Card 1984-1540-000x

Table 2.1.1. OI Processor 68020 Jumper Positions

Jumper	Position 1-2	Position 2-3
HD3	PeerWay Boot	TRU Disk Boot (Normal)
HD4	Not used	Factory set
HD5	Not used	Factory set

Installing the Circuit Cards

Install the following five circuit cards in the TRU card cage as shown in Figure 2.1.2:

- Power Regulator card
 - PeerWay Interface card
 - Printer Interface card
 - SCSI Host Adapter
- or
- SCSI Board 2
 - Console Processor card

Note that the slot between the PeerWay Interface and the Power Regulator cards remains empty.

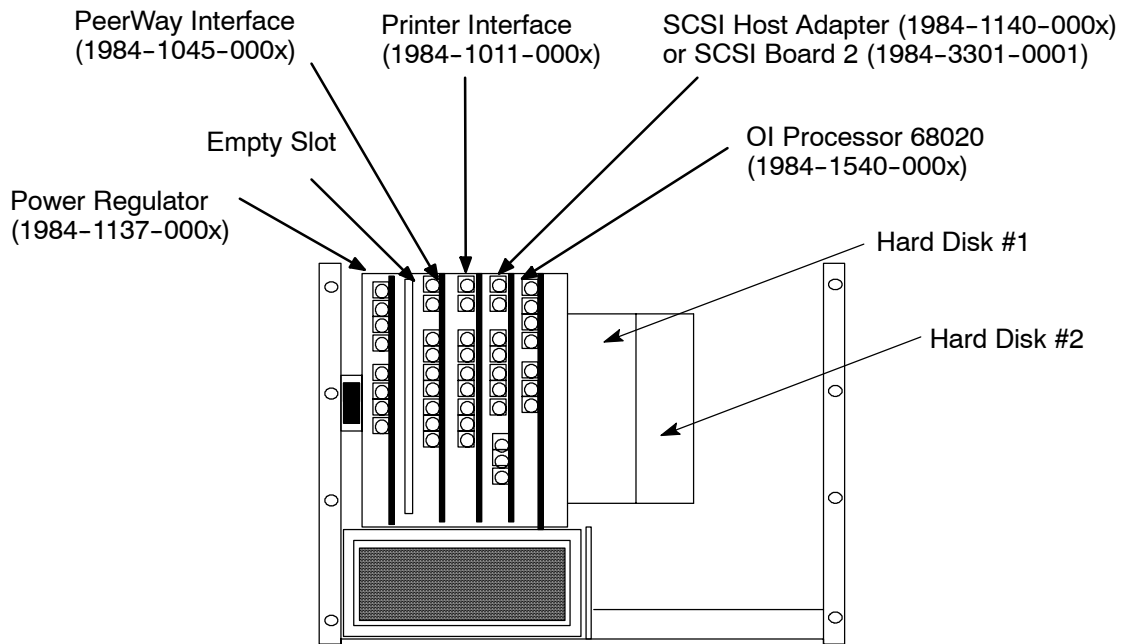


Figure 2.1.2. TRU Circuit Card Layout

Section 2: Configuring the TRU

Configuring the TRU involves various tasks that are dependent upon whether you are configuring the TRU for the first time, or simply loading new software, changing the current configuration, or performing maintenance.

If you are configuring the TRU for the first time, you will need to perform the following tasks:

- Boot up the TRU
- Restore the SRUBOOT tape
- Configure the TRU hard disks
- Configure the plant status
- Configure plant units (optional)
- Configure Alarm Broadcast (see Appendix A, pages A-7 through A-9)
- Load other folders (optional)

If you are loading new software, changing the current configuration, or performing maintenance, you may need to perform some of the procedures listed above as well as powering down the TRU.

This section describes the following tasks for configuring the TRU:

- Booting up the TRU
- Restoring the SRUBOOT tape
- Upgrading a TRU from a running node
- Powering down the TRU
- Configuring the TRU hard disks
- Configuring the plant status
- Configuring plant units
- Loading the configuration file to the TRU

Booting Up a TRU

If a TRU has been powered down, you must boot the TRU up from the SRUBOOT file for it to become operational. You normally boot a TRU node up from the TRU disk, but you can boot it from another node on the PeerWay if needed. This node can be a console node or a TRU node that is running. The SRUBOOT file must exist on the node used to boot up the TRU.

Upon power-up, the TRU node searches for the \$\$SRU configuration file in the Console Configuration folder. You can create a \$\$SRU file by copying the \$\$DEFAULT file from the console disk to a \$\$SRU file with the Destination Disk and TRU node.

To boot a TRU node from its own disk:

- Toggle the card cage power switch to on. The node performs a diagnostic check.

If the proper disk image cannot be located, or if the disk image is bad or corrupted, the power up fails. If the power up fails, perform the procedure for booting a TRU from another node.

To boot a TRU node from another node:

1. Set the TRU boot jumpers to enable the PeerWay boot. For the jumper positions, see “Setting TRU Node Boot Jumpers” earlier in this chapter.
2. Toggle the card cage power switch to on. The node performs a diagnostic check.
3. Boot the TRU by selecting an existing SRUBOOT file on disk or tape.
 - If the file is on disk, perform the Booting A TRU From Disk procedure (see Appendix A, A-10 through A-12).
 - If the SRUBOOT file is on tape, perform the Booting A TRU From Tape procedure (see Appendix A, A-13 through A-14). For more information, see “Restoring the SRUBOOT Tape” later in this section.

Once the Processor card receives the first boot message, the LEDs flash on each time a message is received. Flashing for an extended time indicates that a complete set of messages was received and a checksum is being performed. If the checksum fails, the PeerWay boot is tried again. Because so many messages are being sent, a successful PeerWay boot might take the RS3 more than one attempt.

Restoring the SRUBOOT File

The Trend Resource Unit software, the SRUBOOT file, is stored on a tape that is supplied by Fisher-Rosemount. The TRU needs this file to boot up. You must load the file from the Fisher-Rosemount tape to the TRU disk using the Disk File Restore from Tape operation as described in the following procedure. Figure 2.2.1 shows a sample Disk Activity screen for loading the SRUBOOT file.

□ **To restore the SRUBOOT from tape:**

1. Insert the tape cartridge into the console and load the tape into the TRU. For information on loading a tape, see Appendix A, A-15 through A-17.
2. Call up the Disk Directory PeerWay screen by typing,
DDP [ENTER]
3. Cursor to the tape name and press [SELECT].
4. Cursor to the SRUBOOT file and press [ENTER]. Cursor to the "Operation" field on the Disk Activity screen and press [NEXT OPTION] to select the Disk File Restore from Tape operation.
5. Cursor to the "Destination Disk" field and enter the TRU disk name (or node number:drive number).
6. To alter the name of the restored file, cursor to the "Destination File" field and enter the new file name. Press [ENTER].
7. Cursor to the "Press <ENTER> to Begin" field and press [ENTER] to restore the SRUBOOT file to the TRU disk.
8. To verify that the operation was successful, call up the Disk Event List screen and verify the entry, "Disk File Restore Completed, X Sector(s)".

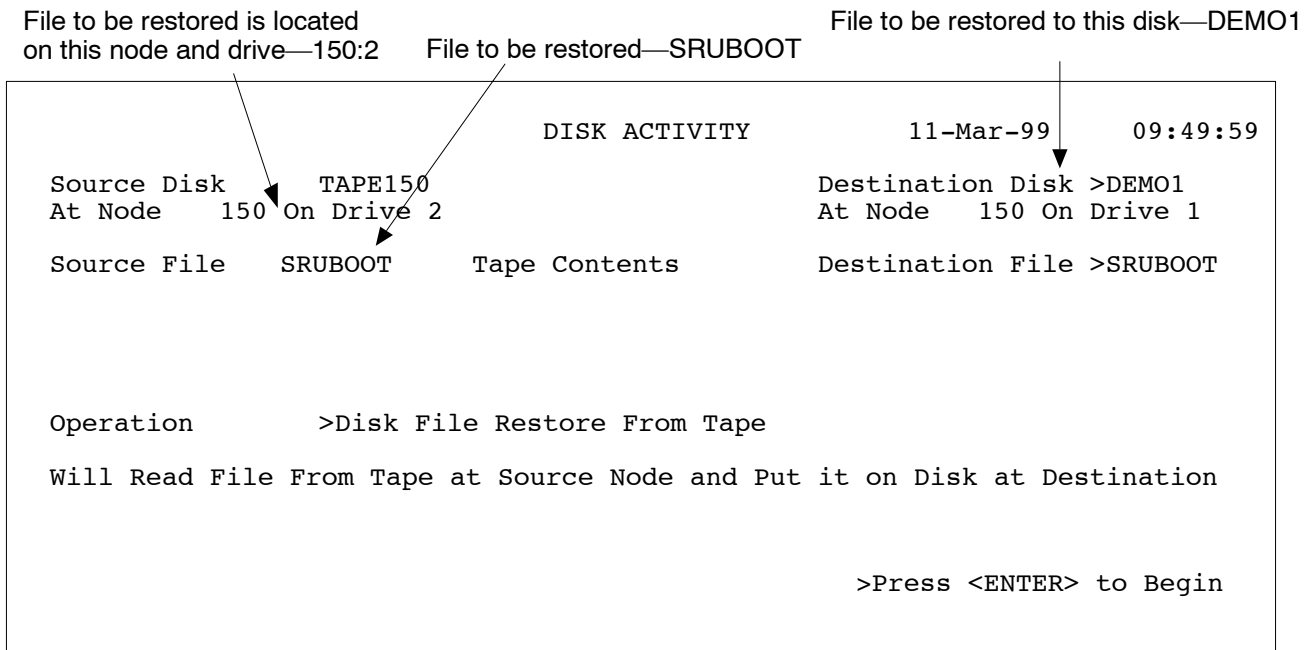


Figure 2.2.1. Disk Activity Screen for Loading the SRUBOOT File

Upgrading a TRU from a Running Node

□ **To upgrade a TRU node from another TRU node that is running:**

1. Back up and delete the following folders from the SRU:
 - Reports
 - RBL Files
 - Log Files
 - Batch Tasks
 - ABC Data
 - ABC Log
 - ASCII Files
 - Process Symbols
 - Process Graphics
2. Delete the SRUBOOT file from the TRU node that is to be upgraded, using the Disk File Delete procedure. For information about deleting files, see Appendix A, pages A-18 through A-19.
3. Copy the SRUBOOT file from either the console disk, a tape, or a running TRU node to the TRU node that is to be upgraded by using the Disk Copy Boot Program procedure. For information about copying files, see Appendix A, pages A-20 through A-22.
4. Toggle the TRU card cage power switch to off to power down the TRU. Wait approximately 10 seconds. (If necessary, see the “Powering Down a TRU” procedure in this section.)
5. Toggle the card cage power switch to on. The node performs a diagnostic check.

If the proper disk image cannot be located, or if the disk image is bad or corrupted, the power up fails. If the power up fails, perform the procedure for booting a TRU from another node.

Powering Down a TRU

Before powering down a TRU to load new software or perform maintenance, you must write the data that is temporarily stored in the storage buffer to disk by using the disk shutdown command. The disk shutdown command performs an orderly shutdown of the TRU hard disk by disabling the trending operations and writing data in the temporary storage buffer to disk. After shutting down the disk, you can power off the TRU.

When you are ready to continue operation, you can power up the TRU.

❑ **To power down a TRU disk:**

1. Cursor to the command line and type:

DS: *(node number)*

It takes about 15 seconds for all of the data in the buffer to be written to the disk.

2. Toggle the TRU card cage power switch to off.

WARNING

Do not power down the TRU without first performing a disk shutdown. If you power down the TRU before performing a disk shutdown, you can damage the disk drives.

Configuring the TRU Hard Disks

If you are configuring the SRUBOOT file for the first time, you must configure the TRU hard disk. You can use any console to configure a TRU disk.

To configure a TRU hard disk, you must configure the TRU folders. Configure the folder sizes relative to the amount of disk space available and the TRU configuration.

Two fields, “Percent Disk Used” and “Capacity in K Bytes”, indicate the amount of disk space available. A TRU with a single hard disk has 80 megabytes available; a TRU with two hard disks has 160 megabytes.

You can allocate disk space as desired, depending on the TRU configuration. Configure the folder sizes as needed, depending on the TRU application. All other folders, except the Console Program folder, can remain configured as a 0 “Size in K Bytes” if desired.

Disk Folder Configuration Screen

Configure folders on the Disk Folder Configuration screen. Enter the desired file size for the TRU Configuration and TRU Data folders on this screen.

☐ To call up the Disk Folder Configuration screen, type:

DC: (node number)

For more information on using the Disk Folder Configuration screen, see Appendix A, A-23 through A-25.

Figure 2.2.2 shows a sample Disk Folder Configuration screen for a TRU that has been configured to perform trending. The folders in the shaded areas are not supported by TRU.

NOTE: Before reconfiguring the Disk Folder Configuration screen, you must disable all control charts.

DISK FOLDER CONFIGURATION						07-May-99	14:39:34
Disk Name	TRU266	at Node	266 Drive 1	Capacity in K Bytes	184808		
Percent Disk Used	99 %			Unused space in K Bytes	11634		
Folder Type	Max Num of Files	Size in K Bytes	Folder Type	Max Num of Files	Size in K Bytes		
Console Program	1	⇒4096	Reports	⇒0	⇒0		
Plant Prog	⇒40	⇒4000	Log Files	⇒0	⇒0		
Peerway I/F Prog	⇒200	⇒2000	Trend Data	⇒20	⇒149500		
Console Config	⇒20	⇒6000	TRU Config	⇒30	⇒2000		
Peerway I/F Conf	⇒200	⇒1000	SRU Data	⇒30	⇒4500		
Plant Config	⇒200	⇒5000	ABC Data	⇒0	⇒0		
RBL Files	⇒0	⇒0	ABC Log	⇒0	⇒0		
Batch Tasks	⇒0	⇒0	ASCII Files	⇒0	⇒0		
Process Symbols	⇒0	⇒0					
Process Graphics	⇒0	⇒0					
Report Config	⇒0	⇒0					

Hit Enter to Configure

FULL Crit 0/0 Adv 0/0 Batch 1/1 Hard 2/30 Sys 4/17

Not supported by TRU

Figure 2.2.2. TRU Disk Folder Configuration Screen

Sample TRU Disk Configuration

Table 2.2.1 provides some sample configurations for various TRU applications.

Table 2.2.1. Sample TRU Disk Configuration

To use the TRU for:	Configure these folders:		
	Type	No. of Files	Size (K Bytes)
Trending	Console Program	1	1024
	Console Config	50	5000
	Trend Data	50	149500
	TRU Config	50	1000

Configuring the Plant Status Screen

The TRU must own the node on which it is configured. You determine node ownership on the Plant Status screen. Because the TRU does not have a Plant Status screen for its node, use the Plant Status screen for the console node and load the TRU plant status information into the \$\$SRU file.

NOTES:

- You must save the current console configuration before you load the TRU plant status information into the \$\$SRU file.
- Once this information is loaded, you cannot view the TRU Plant Status screen.

☐ To configure TRU plant status:

1. Call up the Plant Status screen (**PS** [ENTER]).
2. Cursor to the desired “Node” number field and press [ENTER] to highlight the TRU node number.
3. Use the “Loading the Console Config Folder to the TRU” procedure in this Section to load the TRU plant status information into the \$\$SRU file.

Configuring the Plant Unit Screen

Because of the limited functionality of the TRU, configuration of the Plant Unit screen is not required.

Configuring the Configure Alarm Broadcast (CAB) Screen

In order for the TRU to send to and acknowledge alarms from specific nodes, you must load the CAB screen into the \$\$SRU file.

NOTES:

- You must save the current console configuration before you load the CAB information into the \$\$SRU file.
 - Once this information is loaded, you cannot view the CAB screen.
- To configure the plant unit:**
1. Call up the CAB screen (**CAB** [ENTER]).
 2. Cursor to the desired node numbers and press [ENTER] to highlight the numbers.
 3. Use the “Loading the Console Config Folder to the TRU” procedure in this Section to load the CAB screen into the \$\$SRU file.

Loading the Console Configuration File to the TRU

You will need to assign the following console screens to the TRU:

- Plant Unit Configuration screen
- Plant Status screen
- Config Alarm Broadcast screen

The simplest way to assign these screens is to load the entire console configuration file to the TRU.

□ **To load the Console Config File:**

1. Configure the above screens as explained in the configuration procedures in this section.
2. Perform a “Disk Console Save” operation to save the “All” console configurations using the \$\$SRU file as the “Source File”.

Figure 2.2.3 shows a sample Disk Activity screen for saving “All” files to the \$\$SRU file.

3. Copy the \$\$SRU File from the console to the TRU using the “Disk File Copy” operation.
4. Perform a Disk Load Console operation to restore “Most” of the original console files to the console node, or reconfigure the console. Wait approximately 30 to 45 seconds for the disk cache to write to disk before continuing.

Figure 2.2.4 shows a sample Disk Activity screen for restoring the console file configurations.

5. Toggle the TRU card cage power switch to off to power down the TRU. Wait approximately 10 seconds.
6. Toggle the TRU card cage power switch to on to power up the TRU.

For more information about these disk activity procedures, see the DT manual.

Console files are to be saved to TRU node 32

All console files are to be saved

```

                                DISK ACTIVITY          11-Mar-99      10:45:15
Source Disk At Node 32          CCBOOT30
                                On Drive 1
Source File                      ->$$TRU          Console Config
Config Types                      ->All
Operation                          >Disk Console Save
Will SAVE (record) the Display Configuration OF this console

                                ->Press <ENTER> to Begin
    
```

Figure 2.2.3. Disk Activity Screen for Saving the Console Files to the TRU

Console files are to be restored to console node 30

Most of the console files are to be restored

```

                                DISK ACTIVITY          11-Mar-99      10:46:12
Source Disk At Node 30          CCBOOT30
                                On Drive 1
Source File                      ->TANKS1-2          Console Config
Config Types                      >MOST (except Alarm Event Cnfg and Trend File Cnfg)
Operation                          >Disk Load Console
WARNING: This may change the console displays.
Will LOAD (restore) the Console Configuration TO THIS console

                                ->Press <ENTER> to Begin
    
```

Figure 2.2.4. Disk Activity Screen for Restoring the Console Files

Chapter 3: Using the TRU for Trending

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Section 1: Using the TRU for Trending Operations

This section describes how to use the TRU for trending data.

TRU Trending vs. Console Trending

Table 3.1.1 lists the differences between TRU trending and console trending. Although trending can be performed on either a console or a TRU, a TRU has more disk space available. TRU trend data files can handle more values and larger values than those created on a console.

Table 3.1.1. TRU Trending vs. Console Trending

Characteristic	TRU	Console
Disk Space Available	The capacity of the disk	Space allocated for trend data folder
No. of Trend Files (file name)	4 (5sec, 1min, 10min, 1hour)	9 (trf1-trf9)
Sampling Rate	5 seconds, 1 minute, 10 minutes, 1 hour	1-999 seconds, 1-59 minutes, 1 hour
Type of Sampling	Running average of values	Individual values
Values Trended	32 bit	8 bit
Viewing of Trend Files (from the trend group display)	Viewed on a console node from the trend group display	Viewed on a console node from the trend group display

How to Use the TRU to Perform Trending

The Trend Resource Unit allows trending for up to 1000 points. You can create a trend file on a TRU or a console node. Trending on a TRU uses a 32 bit value that is scaled into engineering units. Only the continuous values A through O and Q, and analog inputs may be trended.

The TRU disk is dedicated to trending and has 160 megabytes of disk space available. Running averages for TRU trending may be kept at 5 seconds, 1 minute, 10 minutes, and 1 hour.

Trended data is stored in a trend data file according to the trending frequency listed in Table 3.1.2.

Table 3.1.2. TRU Trend Files

Data is trended at this interval:	Stored in this trend file:	(file no.)
5 seconds	5sec	1
1 minute	1min	2
10 minutes	10min	3
1 hour	1hour	4

The trend data files reside in the Trend Data folder. The trend configuration resides in file \$TNC in the TRU Configuration folder.

You must configure all four trend files and the variables to be trended on the TRU Trend Configure screen. Figure 3.1.1 shows a sample TRU Trend Configure screen. Press [PAGE AHEAD] or [PAGE BACK] to access the screens for the other points. Table 3.1.3 describes the fields on the screen.

To call up the TRU Trend Node Configure screen, type:

TNC (*volume name or number*) [ENTER]

NOTE: On V18 systems type: **SRT** [ENTER]

All four trend files are configured on this screen.

After configuring the TRU trending, you must disable and then enable the TRU trending to view the new configuration.

```

TRU TREND CONFIGURE          11-Mar-99   09:50:53
Trend Vol:=>STANLEY          Trend Status=>Disabled      Write Config
--> Trend Overflow Warning uses file no.=>2 at=>4 hrs   before full.
File #   Freq   Duration  Disk Used  File #   Freq   Duration  Disk Used
  1      5 sec  =>1 days   =>1 %      3       10 min  =>100 days =>1 %
  2      1 min  =>10 days  =>1 %      4       1 hr    =>999 days =>1 %

      Tag      Frequency  Descriptor
=> 1    => =61E-01  => 5 sec
  2    =>
  3    =>
  4    =>
  5    =>
  6    =>
  7    =>
  8    =>

Total Variables  1000
Variables Used   1
Disk Used        5 %
    
```

All trend variables for all trend files are configured on this screen. The "Frequency" determines the trend file in which the trend data for the point resides.

Figure 3.1.1. TRU Trend Configure Screen

Table 3.1.3. TRU Trend Configure Screen Field Descriptions

Field	Description	Allowable Entries
Descriptor	Descriptor for the block from which the variable is obtained.	Display only
Disk Used	Percentage of disk space used by the file. The maximum amount of disk space is based on the number of tags being sampled, sample duration (2 hours, 30 days, etc.), and sample rate (5 seconds, 1 minute, 10 minutes, 1 hour). Use the following formula to determine the maximum amount of disk space: (nTags * duration) / (sample rate * 4 bytes)	1-200%

NOTE: Bold text indicates the default value.

(continued on next page)

Table 3.1.3. TRU Trend Configure Screen Field Descriptions (continued)

Field	Description	Allowable Entries
Disk Used	Percentage of disk space used by the files based on the maximum number of variables.	Display only
Duration	Length of time, in minutes, hours, or days, that the data is to be sampled and stored on the disk.	1- 999 M, H, D
File #	Number of the trend file.	Display only
Freq	Time between samples.	Display only
Frequency	Time between samples.	5 sec , 1 min, 10 min, 1 hr
Tag	<p>Tag or address of the variable to be stored in the trend file.</p> <p>To select a particular ControlBlock register, use the format (<i>tag or address/continuous register character</i>). Only continuous variables may be included.</p> <p>Once a tag is entered, you can move to the "Tag" field for the next variable and press [ENTER] to configure the tag of the next current block input. Use this method to scroll the current block inputs and then the consecutive block inputs.</p> <p>To delete a variable, enter "None".</p>	Up to 16 alphanumeric characters
Total Variables	Total number of variables that can be used in each file.	Display only
Trend Overflow Warning	<p>Number of the file that will generate a system alarm to warn that the disk will be full within the number of days configured. The alarm indicates that the file must be backed up to prevent data from being overwritten.</p> <p>If the file is not backed up and the disk becomes full, data will be overwritten.</p>	file no.⇒ 1 to 9 at⇒ 1 to X days
Trend Status	Selects status of the trending function on that node. If the node is not a TRU node, the status is displayed as "Not a TRU".	Disabled , Enabled
Trend Vol	Volume on which the trend data is being recorded.	Up to 10 alphanumeric characters
Variables Used	Number of variables actually listed in the files.	Display only

NOTE: Bold text indicates the default value.

Configuring the Trend Files

You can configure trend files on the TRU Trend Configure screen. You can configure trends at 5 second, 1 minute, 10 minute, or 1 hour intervals. The shaded area of Figure 3.1.2 shows the area used to configure trend files and describes how to configure the files.

By viewing the “Disk Used” field in the boxed area in the center of the TRU Trend Configure screen, you can tell whether space is available in the TRU for trending additional variables. This field displays the percentage of disk space that is used by the files and also includes a reserve space of 20 kilobytes. This reserve space is used for storing temporary files while backing up trend files.

To configure trend files:
 1. At the desired trending frequency, enter the amount of time the trend data is to be stored on the disk.

2. Enter the percentage of disk space for the trend file.

```

TRU TREND CONFIGURE      11-Mar1-99      11:47:12
Trend Vol:=>TRU-10      Trend Status=>Enabled      Write Config
--> Trend Overflow Warning uses file no.=>1 at=>1 day before full.
File #  Freq  Duration  Disk Used  File #  Freq  Duration  Disk Used
  1      5 sec =>4 days =>37 %      3      10 min =>35 days =>5 %
  2      1 min =>20 days =>17 %      4      1 hr =>128 days=>4 %

Tag      Frequency  Descriptor
=> 1      =>RED      =>5 sec  Red      Supply
  2      =>YELLOW  =>5 sec  Yellow   Supply
  3      =>BLUE    =>5 sec  Blue     Supply
  4      =>TANK-1  =>5 sec  Mixing   Tank
  5      =>FLOW-1  =>5 sec  Steam    Flow
  6      =>TANK-2  =>10 sec Tank     Temp
  7      =>VALVE-1 =>1 min  Venting  Valve
  8      =>LIQUID  =>10 min LIQUID   LEVEL

Total Variables  1000
Variables Used   40
Disk Used        63 %
    
```

Figure 3.1.2. Configuring the Trend Files

Configuring the Variables to be Trended

You can configure variables and the frequency at which they are to be trended on the TRU Trend Configure screen. Up to 1000 points can be configured. The shaded area of Figure 3.1.3 shows the area for configuring points that are to be trended and describes how to configure the points.

When you enter the Tag/Address into the “Tag” field, the default values appear in the “Frequency” and “Descriptor” fields. The default time value is 5 seconds, but you can select values of 1 minute, 10 minutes, and 1 hour with [NEXT OPTION].

- ☐ **To select a specific point from 1-1000:**
 - Cursor to the arrow and type the desired point number, then press [ENTER].

```

                                TRU TREND CONFIG                18-May-99    13:05:44
Trend Vol:=>415Meg      Trend Status=>Enabled                Write Config
--> Trend Overflow Warning uses file no.>1 at >10 hrs before full.
File #   Freq   Duration  Disk Used   File #   Freq   Duration  Disk Used
  1      5 sec  >6 days  >77 %      3      10 min >30 days  >7 %
  2      1 min  >6 days  >9 %      4      1 hr   >60 days  >4 %

```

>	Tag	Frequency	Descriptor
1	>=951H-82/A	>5 sec	
2	>=951H-82/B	>5 sec	
3	>=951H-82/C	>5 sec	
4	>=951H-83/A	>1 min	
5	>=951H-83/B	>1 min	
6	>=951H-83/C	>1 min	
7	>=951H-84/A	>10 min	
8	>=951H-84/B	>10 min	

Total Variables 1000
 Variables Used 1000
 Disk Used 97 %

```

FULL Crit 0/0 Adv 8/18 Batch 4/8 Hard 2/17 Sys 2/495 joe sysm

```

- ☐ **To configure trend points:**
 1. Enter the tag or address of the point to be trended.

- 2. Press [NEXT OPTION] to select the trending frequency.

Figure 3.1.3. Configuring the Variables to be Trended

Viewing Trend Files

Trend files residing on the TRU can be viewed only in trend groups on an RS3 console. Trend files residing on console disks also can be viewed only as trend groups. Trend groups are configured on and viewed from console disks. On the Trend Group screen, the “Node” field for TRU trend files displays the TRU node on which the file is located. The “Trend File” field is a number from 1–4.

Backing Up Trend Files

You must back up trend files to save old data. Data is stored in the file until the file becomes full. When full, the system begins to overwrite the oldest data residing in the file. If you back up this data before it is overwritten, the data will not be lost.

The TRU trend files have a 1000 point circular file. Actual space is limited by the configured size of the Trend Data folder on the TRU.

You can use one of the four files to generate a system alarm one day (or as many days as you configure it) before the disk is full. This allows for time to back up the file. If you do not back up the file, on the following day (or the time as configured) new data overwrites the oldest data when the disk becomes full.

To generate an alarm to alert you when the disk is nearly full, you must enter the number of the file that will generate an alarm and the number of days before the disk is full in the “Trend Overflow Warning” field. When the disk is full, the TRU generates the following system alarm message:

```
Trend file nearly full
```

When this alarm message appears, back up the designated file immediately. Failure to back up the trend file before the file is full and data is overwritten results in an alarm message:

```
trend file overflow
```

By the time you see this message, data that has been overwritten is lost even if you now back up the trend file.

Figure 3.1.4 shows a sample TRU Trend Configure screen with a trend file nearly full alarm to be generated one day before the file begins to be overwritten.

In this example, one day before the disk is full, file no. 1 will generate a system alarm to warn the user to back up the file.

```

TRU TREND CONFIGURE      07-Mar-99      11:47:12
Trend Vol:=>TRU-10      Trend Status=>Enabled      Write Config
--> Trend Overflow Warning uses file no.=>1 at=>1 day before full.
File # Freq Duration Disk Used File # Freq Duration Disk Used
  1     5 sec =>4 days =>37 %   3    10 min =>35 days =>5 %
  2     1 min =>20 days =>17 %  4     1 hr  =>128 days =>4 %

Tag          Frequency  Descriptor
=> 1  =>02WI-RED    =>5 sec   Red      Supply
  2  =>02WI-YEL    =>5 sec   Yellow   Supply
  3  =>02WI-BLUE   =>5 sec   Blue     Supply
  4  =>=69F 01/C   =>5 sec   Mixing   Tank
  5  =>02Fic101/PV =>5 sec   Steam    Flow
  6  =>02Tic301/PV =>5 sec   Tank     Temp
  7  =>02Pic301/PV =>5 sec   Venting  Valve
  8  =>02LIT/03    =>5 sec   LIQUID   LEVEL

Total Variables 1000
Variables Used  40
Disk Used       63 %
    
```

Figure 3.1.4. Configuring the Trend Overflow Warning

Procedure for Backing Up a Trend File

You need to determine whether all data or only new data is to be backed up.

- If default values are used for start and end backup times, all new data is backed up and marked as “backed up”.
- If times other than the defaults are used, only the requested data is backed up.

Be sure the disk has enough space to hold the sampled data for the frequency and duration that you configure.

TRU trend files can be backed up in time-stamped increments.

If there is an additional trend file that was not generated on this node, you can abort a trend file backup. This additional trend file can use the reserve disk space of 20 kilobytes that is required for storing temporary trend files during backup.

To get the necessary disk space to perform a trend file backup, copy any additional trend files to another volume and then delete those files from the TRU disk. Finally, perform the procedure for backing up a trend file.

To back up a trend file:

1. From the Trend Data Directory screen, select the name of the file to be backed up and press [ENTER].
2. Cursor to the “Operation” field, and press [NEXT OPTION] repeatedly until “Disk File Backup” appears. Press [ENTER]. Figure 3.1.5 shows a sample Disk Activity screen for a Disk File Backup operation.
3. If the destination volume or file is to be changed, cursor to the appropriate field and enter the desired information. Press [ENTER].
4. Cursor to the “Start” field and enter the backup start date and time in the form:
 dd-mm-yy/hh-mm-ss
 Press [ENTER].
5. Cursor to the “End” field and enter the date and time to end the backup in the form:
 dd-mm-yy/hh-mm-ss
 Press [ENTER].
6. Cursor to the “>Press <ENTER> to Begin” field and press [ENTER].

```
                                DISK ACTIVITY                23-Jul-90    11:47:12
Source Disk      TRU30
At Node   30    On Drive   1
Destination Vol. >--EMPTY--
At Node 30    On Drive  2
Source File      10min      Trend Data      Destination File >10min

Start (date/time) >24-Aug-90/12:00:00  End (date/time) >25-Aug-90/09:59:00
Operation          >Disk File Backup
Will COPY file to destination and mark file as backed up
WARNING: Access to source file is denied during backup.

                                >Press <ENTER> to Begin
```

Files created between Aug. 24 at 12:00 and Aug. 25 at 9:59 are to be backed up.

Figure 3.1.5. Trend File Disk File Backup Operation

Saving and Restoring Trend Configurations

You can save or restore trend configurations.

To save a trend file:

1. Cursor to the “Write Config” field on the TRU Trend Configure screen, shown in Figure 3.1.1 through Figure 3.1.4, and press [ENTER].
2. Disable TRU trending.
3. Enable TRU trending.

The trend file is written to the disk.

To restore a trend configuration:

- Perform the Restore Data from Tape operation described in Appendix A, A-26 through A-29.

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Section 1: TRU Subsystem Reference Material

This section provides reference material for configuring and using the TRU subsystem.

For more information about configuring the TRU, see Chapter 2: “Installing and Configuring the TRU”.

Configuration Information

Booting Up and Powering Down a TRU

- During normal operation, the TRU boots using the SRUBOOT file that resides in the Console Program folder.
- If the normal booting operation fails, the TRU boots by using the SRUBOOT file that resides in the Console Program folder located on another node.

Loading the SRUBOOT Tape and Configuring the TRU Disk

- The Disk File Restore From Tape operation can be used to load the SRUBOOT tape.
- The TRU can have one or two hard disks configured.

TRU Disk	Size	Disk Space
One disk	80 megabytes	0-100%
Two disks*	<i>(current number, >160)</i> megabytes	0-200%

* Configured as one large disk.

Configuring the Plant Status Screen

- The TRU must own the node on which it is configured. Node ownership is configured on the Plant Status screen.
- The Disk Console Save operation can be used to save the plant status configuration from a console to an TRU node.
- The Disk Load Console operation can be used to restore the original configuration to the console node.

Configuring the Plant Units Configuration Screen

- The TRU must be assigned to a plant unit so that configuration changes can be made to blocks or tasks. Plant units are assigned on the Plant Unit Configuration screen.
- The Disk Console Save operation can be used to save the plant unit configuration from a console to an TRU node.
- The Disk Load Console operation can be used to restore the original configuration to the console node.

Configuring the Configure Alarm Broadcast (CAB) Screen

- The TRU must be assigned a node on the CAB screen to send alarms to, and acknowledge alarms from, other nodes.
- The Disk Console Save operation can be used to save the CAB screen from a console to a TRU node.
- The Disk Load Console operation can be used to restore the original configuration to the console node.

TRU Subsystem Command Line Options

DC: <i>(node no.)</i>	Calls up the Disk Folder Configuration screen for configuring the TRU disks.
DS: <i>(node no.)</i>	Writes data in the temporary storage buffer to disk.
TNS	Trend Node Status, calls up the TRU Status Display screen on P1 systems.
TRS	Calls up the TRU Status Display screen on Version 18 systems.
TNC	Trend Node Configuration, calls up the TRU Trend Configure screen on P1 systems.
SRT	Calls up the TRU Trend Configure screen on V18 systems.

Section 2: Trending Reference Material

This section provides reference material for using the TRU to perform trending.

For additional information, see Chapter 3: “Using the TRU for Trending”.

TRU Trending

- The TRU has up to 920 megabytes of disk space for trending up to 1000 points.
- Data is trended at the intervals listed in the following table. The trend files 1 through 4 can be viewed as part of a trend group on the Trend Group screen.
- Continuous values A through O, and Q are trended.
- Trend data files reside in the Trend Data folder.
- Trend configuration resides in the \$TNC file in the TRU Configuration folder on P1 systems or in the SRU Configuration folder on V18 systems.

Trend File Operations

- Backing up a trend file: Perform a Disk File Backup operation
- Restoring a trend file: Perform a Restore Data From Tape operation
- Saving a trend file: **Write Config** (TRU Trend Configure screen)

Trending Interval	Trend File Name	Trend File No.
5 seconds	5sec	1
1 minute	1min	2
10 minutes	10min	3
1 hour	1hour	4

TRU Trend Configure Screen

- The TRU Trend Configure screen allows configuration of the four trend files and the variables to be trended.
- Call up the TRU Trend Configure screen with the **TNC** command on P1 systems or the **SRT** command on V18 systems.
- **Trend Overflow Warning** specifies the number of days in advance that an alarm message is to be generated, which alerts you to back up data before it is overwritten.

For information about backing up a trend file, see Appendix A, A-30 through A-32.

In this example, one day before the disk is full, file no. 1 will generate a system alarm to warn the user to back up the file.

Trend Overflow Warning uses file no.⇒1 at⇒1 day before full

- **Duration** specifies the length of time that the data is to be sampled and stored on the disk.
- **Disk Used** specifies the percentage of disk space used by the file. The maximum amount of disk space is based on the number of tags being sampled, the sample duration, and the sample rate.
- **Write Config** saves the trend file configuration.
- **Variable numbers** (along the left of the screen) allow any variable number (1-1000) to be entered for quick configuration access.
- **Frequency** specifies the time between samples (5 seconds, 1 minute, 10 minutes, or 1 hour).
- **Tag** allows quick variable configuration. Once a tag is entered, [ENTER] scrolls the current block inputs and then scrolls the consecutive block inputs.

TR : 4-2-4

Appendixes

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Appendix A: Miscellaneous Reference Material and Procedures

The information and procedures contained in this appendix are included because they are referenced elsewhere in this manual. In some cases, a procedure is included because it is referenced from within another procedure.

PeerWay Interface

The PeerWay Interface (1984-1045-0003) transforms parallel data from the processor bus into synchronous serial data for transmission on the PeerWay. The PeerWay Interface also determines the PeerWay node address of the console and associated OI card cage. It is marked "MC PEERWAY" on the printed wiring assembly (PWA). Figure A.1 shows a functional block diagram of the PeerWay Interface.

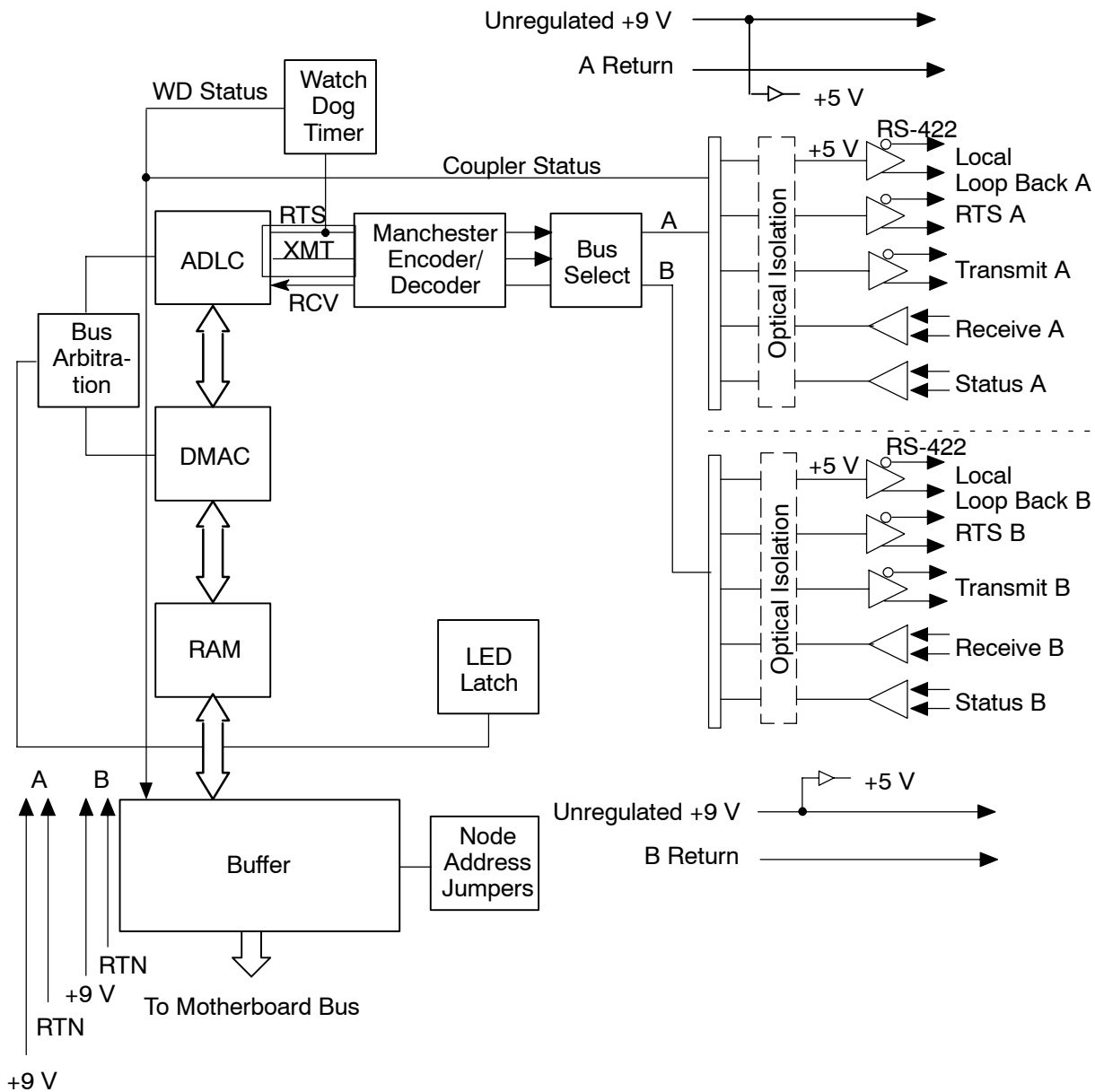


Figure A.1. PeerWay Interface Functional Diagram

NOTE: The PeerWay node address must be an even number. The PeerWay node address is independent of SCSI device addresses used in the Card Cage.

Bus buffers on the PeerWay Interface isolate the board synchronous bus for the Direct Memory Access Controller (DMAC), Advanced Data Link Controller (ADLC), Programmable Timer Module (PTM), write buffer, read buffer, RAM (2K X 8), and a software-driven LED latch.

The RAM buffers transmissions for the PeerWay. The DMAC transfers data from buffer memory to and from the ADLC. The ADLC changes data from parallel to serial for transmission and from serial to parallel data for receiving. The PTM runs the bus access scheme, controlling timeout functions to allow other devices to access the bus at given times.

The Manchester Encoder/Decoder (HD6409) encodes data for transmitting to Non-Return-to-Zero (NRZ) format. NRZ format encodes data and a synchronous clock in the same signal. Rising and falling edges of the transmitter signal keep the phase-lock loop oscillator in the receivers locked onto the transmitter clock frequency.

Serial data is presented to the transmitter section of the card. The transmit and receive sections are connected to the PeerWay Tap by a cable that carries the following signals:

- 9 volts unregulated DC
- Transmit signal (RS-422) to PeerWay
- RTS signal (RS-422) enables PeerWay Tap transmitter
- Local Loop Back Signal (RS-422) enables online relay
- Status (RS-422) returns status of the local loop back (LLB) relay and watchdog timer
- Receive signal (RS-422) from PeerWay

An analog watchdog timer monitors the RTS signal and disables the transmitter if the length of the transmission exceeds 67 milliseconds. A backup watchdog timer on the PeerWay Tap has the same function.

Signals are isolated from chassis ground by special isolated voltages and optical isolators on the PeerWay Interface. TIL 155 OPTOs handle DC signals (RTS, LLB and STATUS), and high speed 6N137s OPTOs manage the transmit and receive signals.

All signals are transmitted in RS-422 format, a differential signal transmission at TTL voltage levels. The two output lines of the transmitter are driven 180 degrees out of phase and a voltage comparator at the receive end changes the signal back to a single TTL line.

Two 3-terminal voltage regulators are included to regulate the +9 V from the Power Regulator card down to +5 V. The 5 volt sources supply voltage to the A and B PeerWay isolated circuits.

PeerWay Interface LEDs and Test Points

LEDs on the PeerWay Interface card indicate different status conditions. Figure A.2 shows the LEDs.

The test points are:

- TP1 +5V Isolated DC for Tap A (Yellow)
- TP2 A Return (Gray)
- TP3 +5V Isolated DC for Tap B (Yellow)
- TP4 B Return (Gray)

ⓐ	DS1 Card Good	No faults are detected on the card.
Ⓡ	DS2 Card Fault	A fault is detected in the communication link.
Ⓨ	DS4 PW Tap ST A	The timer in tap A has timed out.
Ⓨ	DS5 PW Tap ST B	The timer in Tap B has timed out.
Ⓨ	DS6 RTS	Ready to send generated from PeerWay Interface.
Ⓨ	DS7 Bus Active	The PeerWay Interface is receiving data.
Ⓨ	DS8 A Active	The Interface is using the A PeerWay.
Ⓨ	DS9 B Active	The Interface is using the B PeerWay.
Ⓨ	DS10 CMD Active.	Command active. The software is actively executing a command on the Interface Board.

Figure A.2. PeerWay Interface LEDs

PeerWay Interface Jumpers

Four jumpers on the PeerWay Interface set the node address of the Console and the OI Card Cage. The sum of the jumper values plus 2 determines the node address, which can only be an even number. Figure A.3 shows the PeerWay Interface jumper locations. Table A.1 shows the jumper values.

Figure A.4 shows the jumper setting for a PeerWay node address of 16. The name of each jumper is marked at the right of the jumper. The least significant (LS) jumper is at the top and the most significant (MS) is at the bottom. A jumper has the listed value in the (1-2) position and a 0 value in the 2-3 position. Total the values and add 2 to get the node address.

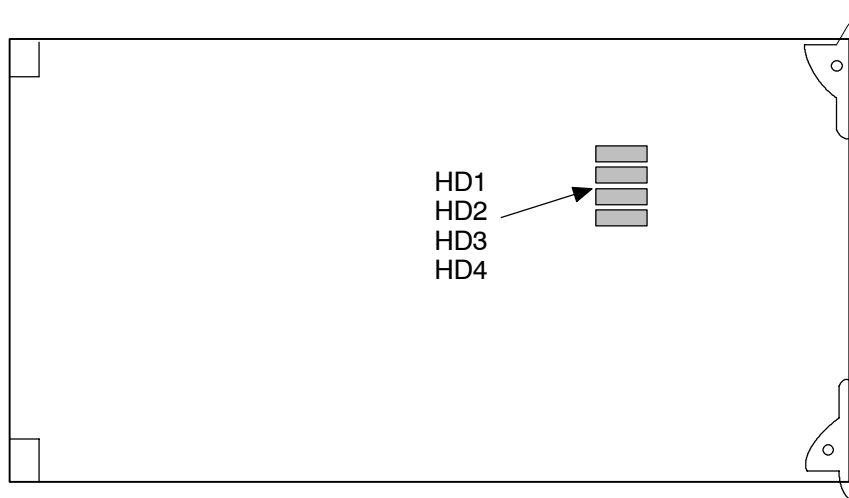


Figure A.3. PeerWay Interface Jumper Locations

Table A.1. PeerWay Interface Jumper Values

Jumper	Value at 1-2	Value at 2-3
HD1	2	0
HD2	4	0
HD3	8	0
HD4	16	0

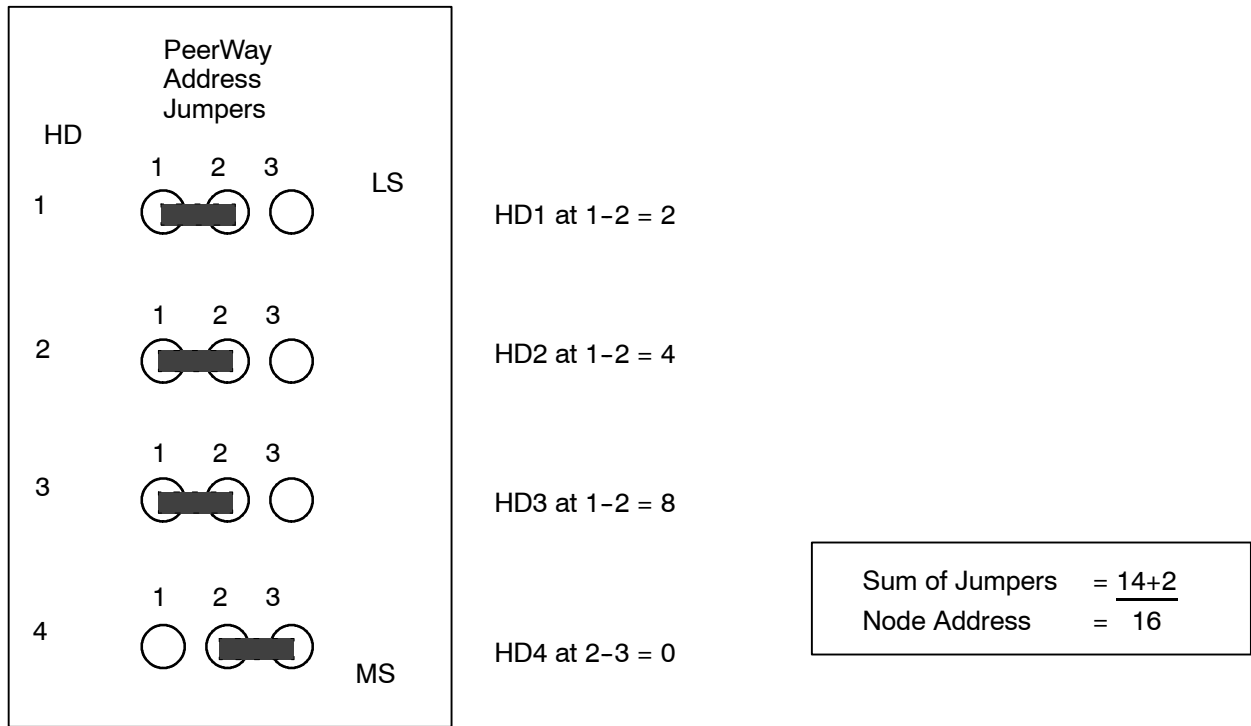


Figure A.4. Setting the Node Address Jumpers

NOTE: Setting the jumper for use on a PeerWay other than PeerWay number 1 requires that you calculate the jumper setting:

$$\text{Jumper Setting} = \text{HN} - (\text{P\#} - 1) * 32$$

Where:

HN is the node number as shown on the CCC screen.

P# is the PeerWay number.

The result is the desired jumper setting value.

Managing the Number of Alarm Messages on the PeerWay

Normally, an alarm condition generates an alarm message on the PeerWay for each node in the system. You can reduce the number of alarm messages on the PeerWay in the following ways:

- If you have multiple PeerWays connected, or if the performance of the PeerWay has declined, you may want to reduce the number of nodes that get ControlFile and console alarm messages. You can do this with the Configure Alarm Broadcast screens.
- If you do not want alarms from a ControlBlock to generate under certain conditions, you can inhibit alarms from generating with ControlBlock logic.
- If you do not want alarms from a Controller Processor to generate under certain conditions, you can automatically inhibit alarms from generating with ControlBlock logic or manually inhibit alarms from generating with the ControlFile Status screen.

Configuring Which Nodes Are Sent Alarms from a ControlFile or Console

If you have multiple PeerWays connected together, or if PeerWay performance has declined, you may want to limit the amount of PeerWay traffic by using the Configure Alarm Broadcast feature. Configure Alarm Broadcast (CAB) is used to reduce unnecessary alarm messages and alarm acknowledge traffic on the PeerWay.

Normally, if an alarm occurs or is acknowledged in a ControlFile, console, or TRU, an alarm message is sent to every existing node on all connected PeerWays. However, you can use the Configure Alarm Broadcast screens to specify which nodes are sent alarms from a specific ControlFile, TRU, or console (see Figure A.5). Each ControlFile, TRU, and console has its own alarm broadcast configuration.

Configure Alarm Broadcast screens are used to filter the sending of alarms, while the Plant Status and Plant Unit screens are used for receiving them. The CAB for consoles is saved in the Alarm/Event configuration portion of the Console Configuration file. The CAB for one or more ControlFiles can be saved to a Plant Config file (type CAB). To save and restore the Alarm Broadcast Configurations, see the *Disk and Tape Functions Manual*.

NOTE: When you configure a TRU, make sure that you send the alarms to a console. Otherwise, you will not receive alarm messages generated by that TRU.

To call up:

- **C A B** (node #) [ENTER] at the command line

To access other screens:

- [PAGE AHEAD] and [PAGE BACK] to see other ControlFile node numbers.

Nodes that are sent alarms are backlighted. Each ControlFile, TRU, and console must have its own CAB screen configured.

To select or deselect a single node:

- Cursor to the node number and press [ENTER].

Node	116	Configure Alarm Broadcast										23-Apr-99	11:47:12		
1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255
16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256

Set range →3,6

Clear range →

Local Pway

Initialize

CONFIG 4

To deselect a range of nodes:

- Cursor to the "Clear range" field, type a range of numbers separated by a comma (for example "3,6"), then press [ENTER].

To select a range of nodes:

- Cursor to the "Set range" field, type a range of numbers separated by a comma (for example "3,6"), then press [ENTER].

To select all the nodes on the local PeerWay

- Cursor to the "Local Pway" field and press [ENTER].

Uninitialize indicates that alarms are sent to all active nodes.
Initialize indicates that alarms are only sent to the selected nodes.
 This field is not used on the CAB screen for consoles.

Figure A.5. Configure Alarm Broadcast Screen

RS3: Appendixes

Miscellaneous Reference Material and Procedures

PeerWay Booting a TRU from Disk

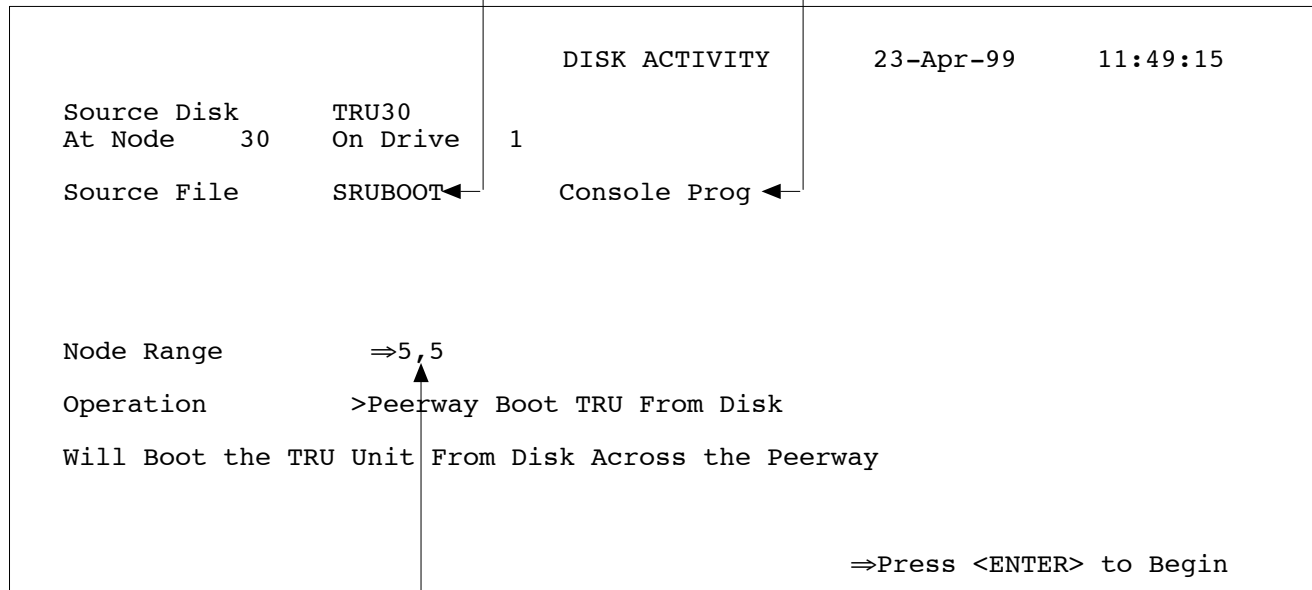
The PeerWay Boot TRU from Disk operation allows you to use the SRUBOOT file on a disk to get a TRU running. To boot a TRU from disk perform the following tasks:

1. Set the TRU boot jumpers to enable the PeerWay boot. For the jumper positions, see “Setting TRU Node Boot Jumpers” in Chapter 2.
2. Toggle the card cage power switch to on. The node performs a diagnostic check.
3. Perform the PeerWay Boot TRU From Disk operation described in Table A.2 to get the TRU running.
4. Perform a Disk File Delete operation to delete the current SRUBOOT file on the TRU node. See Table A.6.
5. Perform a Disk File Copy operation to copy the SRUBOOT file from the disk to the TRU. See Table A.7.
6. Toggle the card cage power switch to off.
7. Set the TRU boot jumpers to disable the PeerWay boot.
8. Toggle the card cage power switch to on. The node performs a diagnostic check.

NOTE: The PeerWay Boot TRU from Disk operation requires that the boot console own the TRU. Node ownership is configured on the Plant Status screen (see Chapter 4, 4-1-3).

Figure A.6 shows a sample Disk Activity screen for booting a TRU on node 5 from a TRU on node 30.

File used to boot the TRU—SRUBOOT SRUBOOT file is located in the Console Program folder



SRUBOOT file is to be loaded to the TRU on node 5

Figure A.6. Disk Activity Screen: Peerway Boot TRU from Disk

Table A.2. Procedure to PeerWay Boot TRU from Disk

Step	Operation	Description
1	Action: Comments:	Be sure that the TRU node boot jumpers are enabled. See "Setting TRU Node Boot Jumpers" in Chapter 2.
2	Action: Response:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears.
3	Action: Response:	Cursor to the disk volume name or location containing the SRUBOOT file, and press [SELECT]. The Disk Directory screen appears.
4	Action: Response:	Cursor to the Console Program folder name, and press [SELECT]. The Console Prog Directory screen appears.
5	Action: Response:	Cursor to the name of the file to be loaded (SRUBOOT), and press [ENTER]. The Disk Activity screen appears.

(continued on next page)

Table A.2. Procedure to PeerWay Boot TRU from Disk (continued)

Step	Operation	Description
6	<p>Action:</p> <p>Response:</p>	<p>Cursor to the "Operation" field on the Disk Activity screen. Press the [NEXT OPTION] button repeatedly until the following message appears above the "Operation" field:</p> <p style="padding-left: 40px;">Peerway Boot TRU From Disk</p> <p>Press [ENTER].</p> <p>The "Peerway Boot TRU From Disk" message appears in the "Operation" field.</p>
7	<p>Action:</p>	<p>Cursor to the "Node Range" field. Enter the address of the node to which the file is to be loaded. For example, 2,3 specifies that the SRUBOOT file is to be loaded to the TRU on nodes 2 and 3. Press [ENTER].</p>
8	<p>Action:</p> <p>Response:</p>	<p>Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. While the operation is in progress this field reads:</p> <p style="padding-left: 40px;">Disk Operation in Progress</p> <p>The operation is complete when the "Press <ENTER> to Begin" field reappears.</p>
9	<p>Action:</p> <p>Response:</p>	<p>To verify that the Peerway Boot TRU From Disk operation was successful, call up the DISK EVENT LIST screen by typing:</p> <p style="padding-left: 40px;">DEL [ENTER]</p> <p>The Disk Event List screen appears and shows the following entry:</p> <p style="padding-left: 40px;">Peerway Boot of TRU Node(s) x is successful</p>

PeerWay Booting a TRU from Tape

The PeerWay Boot TRU from Tape operation allows you to use the SRUBOOT file that is on a tape to get the TRU running. To boot a TRU from tape, perform the following tasks:

1. Set the TRU boot jumpers to enable the PeerWay boot. For the jumper positions, see “Setting TRU Node Boot Jumpers” in Chapter 2.
2. Perform the PeerWay Boot TRU From Tape operation (Table A.3) to get the TRU running.
3. Perform a Disk File Delete operation to delete the current SRUBOOT file on the TRU node. See Table A.6
4. Perform a Disk File Copy operation to copy the SRUBOOT file from the tape to the TRU. See Table A.7.
5. Toggle the card cage power switch to off.
6. Set the TRU boot jumpers to disable the PeerWay boot.
7. Toggle the card cage power switch to on. The node performs a diagnostic check.

Figure A.7 shows a sample Disk Activity screen for booting the TRU on node 10.

```

File used to boot the TRU—SRUBOOT
DISK ACTIVITY          23-Apr-99    11:52:35
Source Disk            TRU30
At Node                30           On Drive 1
Source File            SRUBOOT←
Node Range             =>10,10
Operation              >Peerway Boot TRU From Tape
Will Boot the TRU Unit From Tape Across the Peerway
                                                                =>Press <ENTER> to Begin
  
```

SRUBOOT file is to be loaded to the TRU on node 10

Figure A.7. Disk Activity Screen: Peerway Boot TRU from Tape

Table A.3. Procedure to PeerWay Boot a TRU from Tape

Step	Operation	Description
1	Action: Comments:	Be sure that the TRU node boot jumpers are enabled. See "Setting TRU Node Boot Jumpers" in Chapter 2.
2	Action: Response:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears.
3	Action: Response:	Cursor to the name or location of the tape containing the SRUBOOT file and press [ENTER]. The Disk Activity screen appears.
4	Action: Response:	Cursor to the "Operation" field on the DISK ACTIVITY screen. Press the [NEXT OPTION] button repeatedly until the following message appears above the "Operation" field: Peerway Boot TRU From Tape Press [ENTER]. The "Peerway Boot TRU From Tape" message appears in the "Operation" field.
5	Action:	Cursor to the "Node Range" field. Enter the address of the node to which the file is to be loaded. For example, 2,3 specifies that the SRUBOOT file is to be loaded to the TRU on nodes 2 and 3. Press [ENTER].
6	Action: Response:	Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. While the operation is in progress this field reads: Disk Operation in Progress The operation is complete when the "Press <ENTER> to Begin" field reappears.
7	Action: Response:	To verify that the Peerway Boot TRU From Tape operation was successful, call up the Disk Event List screen by typing: DEL [ENTER] The Disk Event List screen appears and shows the following entry: Peerway Boot of TRU Node(s) (Node #) successful

Loading a Tape

Before any activity can be performed with a tape, the tape must be loaded into the system.

Unless you have configured the Tape Auto Load feature, that loads tapes automatically when inserted in the tape drive, you must manually load a tape into the tape drive. Until the tape drive is loaded, the Disk Directory PeerWay screen displays “--UNLOADED--” for that media drive location. The Tape Load operation reads the entire tape, constructs a tape directory table (map of the files stored on the tape), and loads this table onto the hard disk. Figure A.8 shows a tape containing the files \$\$DEFAULT, TANKS1-2, and TANKS3-4 being loaded onto a disk.

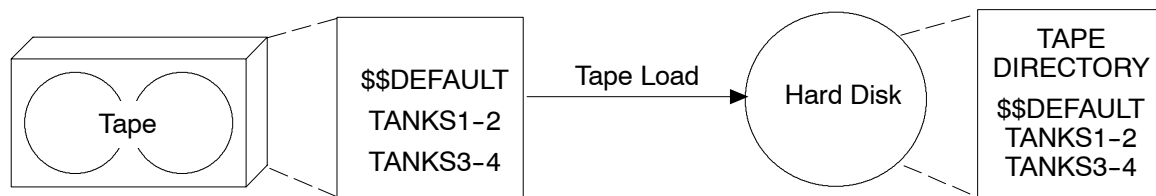


Figure A.8. Loading a Tape

The tape directory table is maintained as long as the tape is installed in the drive. If the tape is removed, the tape directory table is deleted from the hard disk. When a new tape is installed, a Tape Load operation must be performed in order to build a new tape directory table. To construct this table initially, allow up to 9 minutes, depending on the amount of data on the tape. Once constructed, the table is available for instant access as long as the tape remains loaded.

NOTE: If the “Tape Auto Load” field on the Configure Command Console screen is Yes, the tape is loaded as soon as it is inserted.

Figure A.9 shows the proper orientation of a tape cartridge that is to be loaded into a vertical or horizontal tape drive slot. Figure A.10 shows a sample Disk Activity screen for loading a tape in drive 2 of node 8. Table A.4 lists the steps in the Tape Load Operation.

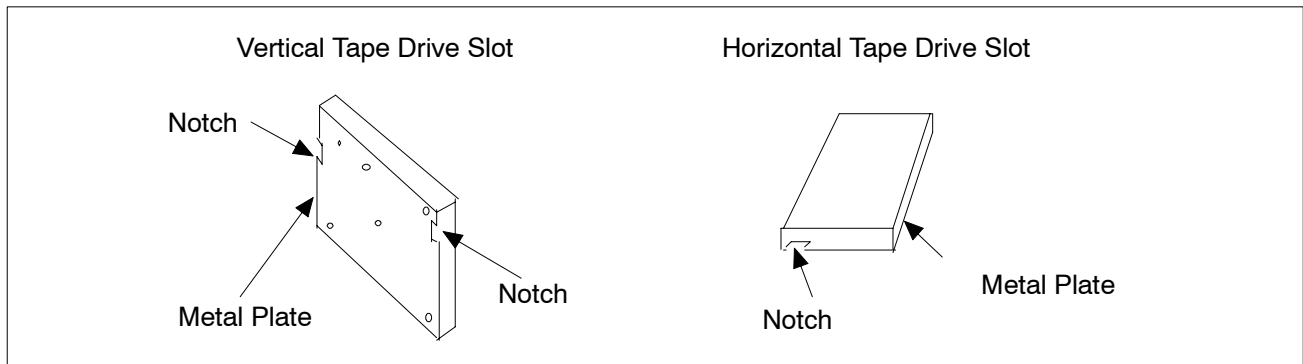


Figure A.9. Tape Cartridge

```

Node and drive indicating
location of tape to be loaded
↓
Source Disk      UNLOADED
At Node 8       On Drive 2

DISK ACTIVITY                23-Apr-99    10:27:44

Operation        >Tape Load
Will READ the contents of a Tape inserted into the drive

                                     >Press <ENTER> to Begin
    
```

Figure A.10. Disk Activity Screen: Tape Load

Table A.4. Tape Load Operation

Step	Operation	Description
1	Action:	<p>For vertical tape drives:</p> <ul style="list-style-type: none"> • Insert the tape cartridge into the tape drive as shown in , with the metal plate of the cartridge on the left side and the notches located near the top. • Slide the tape drive button down. <p>For horizontal tape drives:</p> <ul style="list-style-type: none"> • Insert the tape cartridge into the tape drive as shown in , with the metal plate of the cartridge on the bottom and the notches located on the left side. • Slide the tape drive button to the right.
2	Action: Response:	<p>Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears.</p>
3	Action: Response: Comments:	<p>Cursor to the name or location of the tape to be loaded, and press [ENTER]. The Disk Activity screen appears. The tape is listed as Unloaded in the "Drive" field.</p>
4	Action: Response:	<p>Cursor to the "Operation" field on the Disk Activity screen. Press the [NEXT OPTION] key repeatedly until the following message appears above the "Operation" field: Tape Load Press [ENTER]. The "Tape Load" message appears in the "Operation" field.</p>
5	Action: Response: Comments:	<p>Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. The tape drive light comes on and remains on until the Tape Unload procedure is completed. While the operation is in progress, this field reads: Tape Operation in Progress The operation is complete when the "Press <ENTER> to Begin" field reappears. The operation takes up to 9 minutes to complete.</p>
6	Action: Response:	<p>CAUTION Do not remove the tape until the operation is completed. The tape drive light remains on while the tape is being initialized or loaded. To prevent damaging the tape, never remove a tape while the tape drive light is on.</p> <p>To verify that the Tape Load operation was successful, call up the Disk Event List screen by typing: DEL [ENTER] The Disk Event List screen appears and the entry reads: Tape Load Complete Node:Drive = node number:drive number</p>

Unloading a Tape

The Tape Unload operation rewinds the tape back to the beginning, turns off the tape drive light so the tape can be removed, and deletes the tape directory table from the hard disk. The Tape Unload procedure should always be done before you remove a tape from the drive.

Figure A.11 shows a sample Disk Activity screen for unloading tape CCTAPE3 from node 8. Table A.5 lists the steps in the Tape Unload operation.

Name, node, and drive indicating location of tape to be unloaded

```

                                DISK ACTIVITY                23-Jun-92    11:47:12
Source Disk      CCTAPE3
At Node      8   On Drive    2

Operation      >Tape Unload
Will Unload Tape to be removed from the drive

                                >Press <ENTER> to Begin
```

Figure A.11. Disk Activity Screen: Tape Unload

Table A.5. Tape Unload

Step	Operation	Description
1	Action: Response:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears.
2	Action: Response:	Cursor to the name or location of the tape to be unloaded, and press [ENTER]. The Disk Activity screen appears.
3	Action: Response:	Cursor to the "Operation" field on the Disk Activity screen. Press the [NEXT OPTION] key repeatedly until the following message appears above the "Operation" field: Tape Unload Press [ENTER]. The "Tape Unload" message appears in the "Operation" field.
4	Action: Response: Comments:	Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. While the operation is in progress this field reads: Tape Operation in Progress The operation is complete when the "Press <ENTER> to Begin" field reappears and the tape drive light goes off. The operation takes several minutes to complete.
5	Action:	Lift the tape drive cover and slide up the tape drive button to eject the tape. Remove the tape from the tape drive.
6	Action: Response:	To verify that the Tape Unload operation was successful, call up the Disk Event List screen by typing: DEL [ENTER] The Disk Event List screen appears and the entry reads: Tape Unload Complete Node:Drive = node number:drive number

Deleting a File

The Disk File Delete operation erases the specified file from a disk. Use this operation to delete files in any type of folder.

Figure A.12 shows a sample Disk Activity screen for deleting the ECCBOOT file from disk CCBOOT30. Use the procedure in Table A.6 to delete a file.

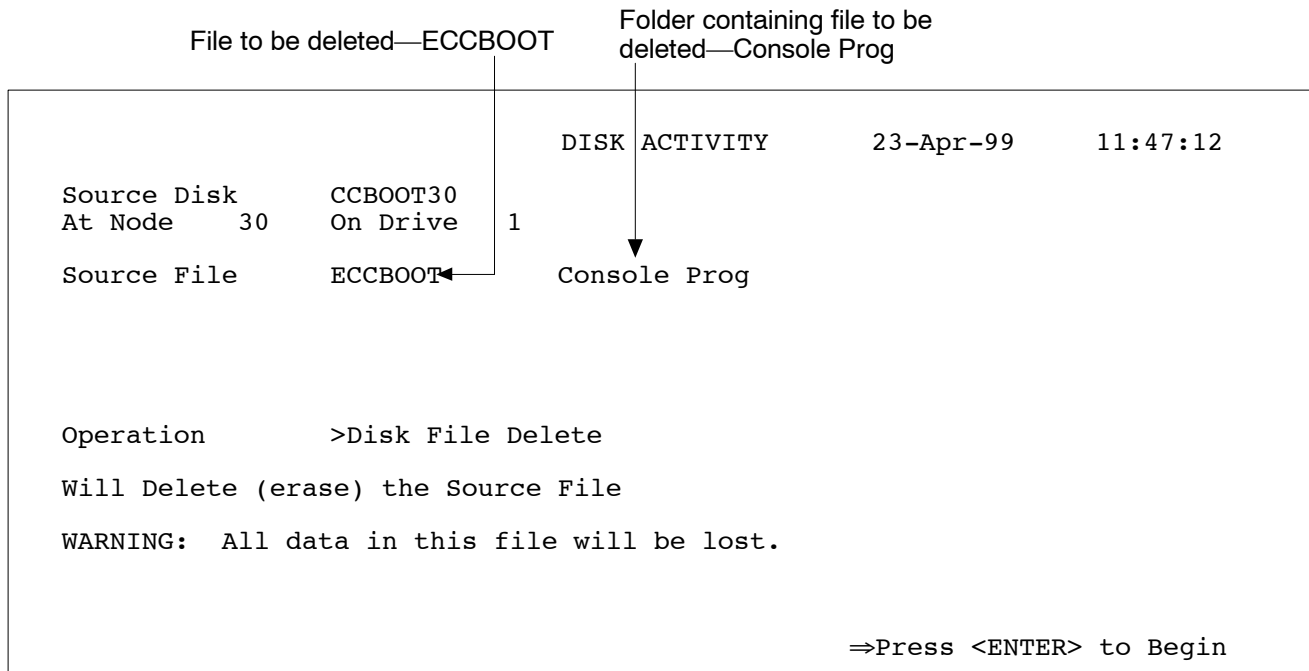


Figure A.12. Disk Activity Screen: Disk File Delete

Table A.6. Disk File Delete

Step	Operation	Description
1	Action: Response: Comments:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears. NOTE: If volumes with duplicate names are mounted, both names flash on and off on the Disk Directory PeerWay screen; also this message appears: WARNING: Duplicate Volume Names
2	Action: Response:	Cursor to the volume name or location of the file to be deleted, and press [SELECT]. The Disk Directory screen appears.
3	Action: Response:	Cursor to the name of the folder containing the file to be deleted, and press [SELECT]. The folder Directory screen appears.
4	Action: Response:	Cursor to the name of the file to be deleted, and press [ENTER]. The Disk Activity screen appears.
5	Action: Response:	CAUTION The Disk File Delete operation erases all data stored in that specific file. The data is lost forever unless the file is stored on a backup disk or tape. Action: Cursor to the "Operation" field on the Disk Activity screen. Press the [NEXT OPTION] key repeatedly until the following message appears above the "Operation" field: Disk File Delete Press [ENTER]. Response: The "Disk File Delete" message appears in the "Operation" field.
6	Action: Response: Comments:	CAUTION Continuing this procedure causes all data in the source file to be lost. Be sure that the correct disk and file names appear in the "Source Disk" and "Source File" fields. Action: Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. Response: While the operation is in progress this field reads: Operation in Progress The operation is complete when the "Press <ENTER> to Begin" field reappears. Comments: The operation takes several minutes depending on the amount of data to be deleted.
7	Action: Response:	To verify that the File Delete operation was successful, call up the Disk Event List screen by typing: DEL [ENTER] Response: The Disk Event List screen appears and the entry reads: DXD: Disk File Delete Done

Copying a File to a Disk

The Disk File Copy operation copies the contents of one file to another file. Files can be copied to the same disk, or to another disk. The Disk File Copy operation can be used to copy all files except console program files.

Figure A.13 shows a sample Disk Activity screen for copying file 10Min to file 10Min-1 on disk CCBOOT30. When a file is copied to the same disk, the duplicate file must have a different name than the source file.

Figure A.14 shows a sample Disk Activity screen for copying file 10Min on disk CCBOOT30 to disk CCBOOT60.

Use the procedure in Table A.7 to copy a file to a disk.

NOTE: To copy a file to a tape, perform a Disk File Backup operation.

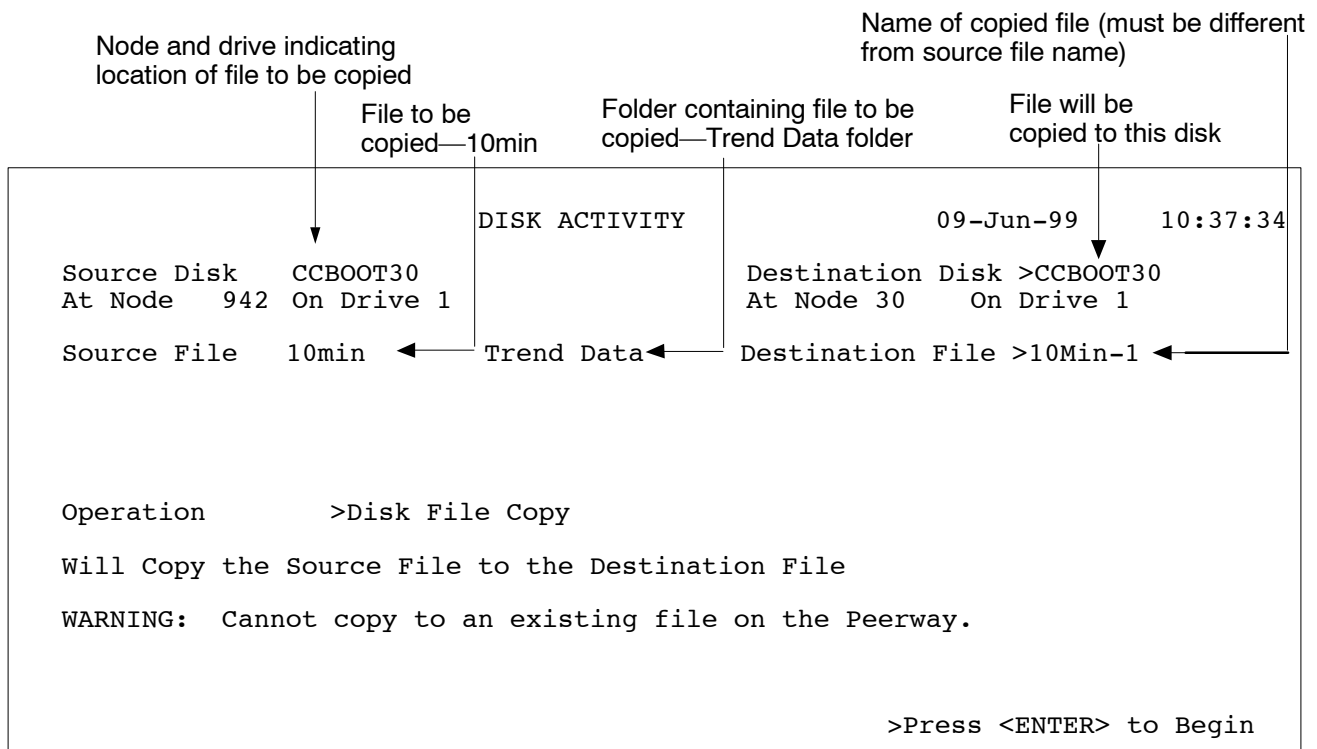


Figure A.13. Disk Activity Screen: Disk File Copy to the Same Disk

Copying a File to a Disk (continued)

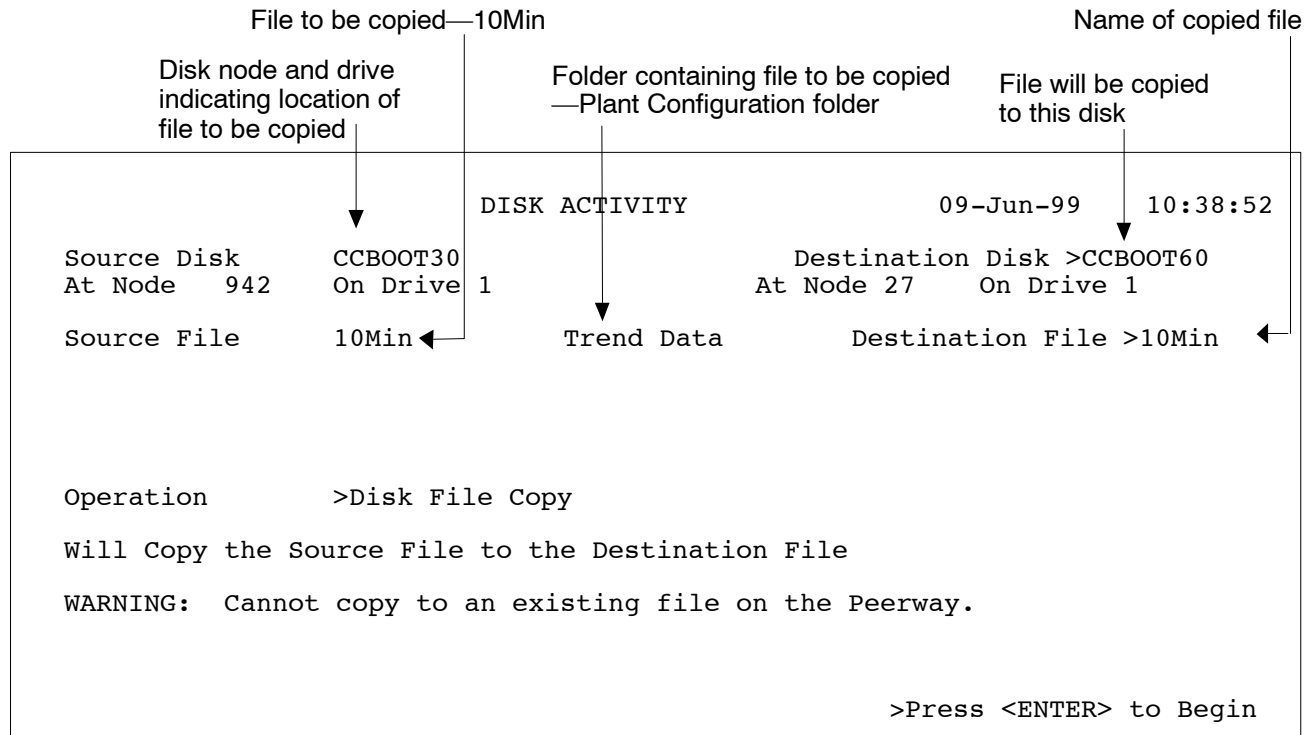


Figure A.14. Disk Activity Screen: Disk File Copy to a Different Disk

Figure A.15 shows a file 10Min on disk CCBOOT30 being copied to 10Min-1 on the same disk.

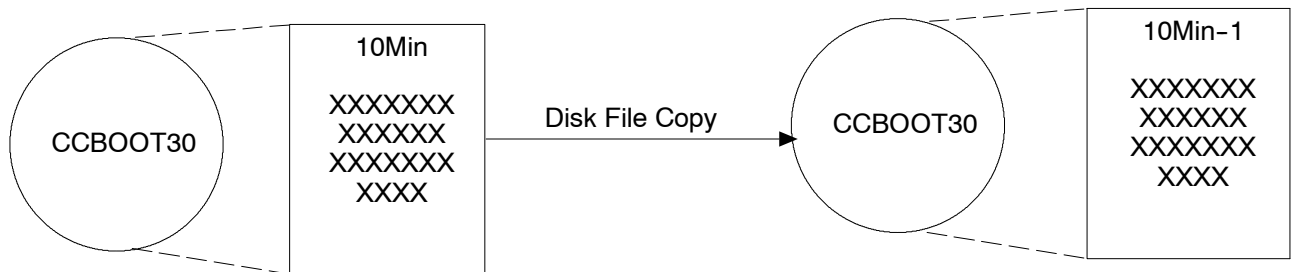


Figure A.15. Copying a File to a Disk

Table A.7. Disk File Copy

Step	Operation	Description
1	Action: Response:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory Peerway screen appears.
2	Action: Response:	Cursor to the disk name or location of the volume containing the console program, and press [SELECT]. The Disk Directory screen appears.
3	Action: Response:	Cursor to the name of the folder containing the file to be copied, and press [SELECT]. The folder Directory screen appears.
4	Action: Response:	Cursor to the name of the file to be copied , and press [ENTER]. The Disk Activity screen for the file to be copied appears.
5	Action: Response:	Cursor to the "Operation" field on the Disk Activity screen. Press the [NEXT OPTION] key repeatedly until the following message appears above the "Operation" field: Disk File Copy Press [ENTER]. The "Disk File Copy" message appears in the "Operation" field.
6	Action: Response:	To copy from one disk to another, cursor to the "Destination Disk" field. Type the name of the destination disk (or the node number:drive number) for a copy of the file, and press [ENTER]. The name of the destination disk appears in the "Destination Disk" field.
7	Action: Response: Comments:	Cursor to the "Destination File" field. Type the name of the file for a copy of the data, and press [ENTER]. This must be a new file name if copying to the same disk. The name of the destination file appears in the "Destination File" field. NOTE: If copying to a new file on the same disk, specify a different name for the duplicate file.
8	Action: Response: Comments:	Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. While the operation is in progress this field reads: Disk Operation in Progress The operation is complete when the "Press <ENTER> to Begin" field reappears. The operation takes several minutes to complete, depending on the amount of data to be copied.
9	Action: Response:	To verify that the Disk File Copy operation was successful, call up the Disk Event List screen by typing: DEL [ENTER] The Disk Event List screen appears and the entry reads: Disk File Copy Done, X Sector(s) Copied

Changing the Hard Disk Configuration

You can change the minimum starting configuration to configure a hard disk as desired. Figure A.16 shows the Disk Folder Configuration screen, with the recommended starting configuration. Use the procedure in Table A.8 to change the hard disk configuration.

NOTE: Before changing the hard disk configuration, be sure to disable trending on all consoles using the disk being configured.

Maximum number of files to be configured. Each file uses one disk sector. The highest value allowed is 1000.

10:54:44

DISK FOLDER CONFIGURATION 03-Jul-96

Disk Name WINI at Node 16 Drive 1 Capacity in K Bytes 264438
 Percent Disk Used 99 % Unused space in K Bytes 1472

Folder Type	Max Num of Files	Size in K Bytes	Folder Type	Max Num of Files	Size in K Bytes
Console Program	⇒1	⇒5120	Reports	⇒0	⇒0
Plant Prog	⇒200	⇒20480	Log Files	⇒0	⇒0
Peerway I/F Prog	⇒50	⇒2048	Trend Data	⇒200	⇒149500
Console Config	⇒300	⇒6144			
Peerway I/F Conf	⇒20	⇒3072	SRU Data	⇒200	⇒10240
Plant Config	⇒200	⇒6144	ABC Data	⇒0	⇒0
RBL Files	⇒0	⇒0	ABC Log	⇒0	⇒0
Batch Tasks	⇒0	⇒0	ASCII Files	⇒0	⇒0
Process Symbols	⇒0	⇒0			
Process Graphics	⇒0	⇒0			
Report Config	⇒0	⇒0			

Hit Enter to Configure

Figure A.16. Disk Folder Configuration Screen

Table A.8. Disk File Configuration Command

Step	Operation	Description
1	Action: Comments:	Determine the files that need to be backed up to tape (and reloaded later) and print out the filenames. Disk files will not be retained through the configuration change procedure. Filenames can be accessed through the Disk Directory PeerWay screen.
2	Action: Comments:	Backup all files that need to be saved. See the Disk Backup or Create Boot Tape operation to save all files, or the Folder Backup and Disk File Backup operations to save selected files. NOTE: We recommend that you perform a Tape Unload operation and then a Tape Load operation after the backup is complete to verify that the tape loads properly <i>before</i> continuing with the configuration change.
3	Action: Response:	Call up the Disk Folder Configuration screen by typing: DC: [ENTER] The Disk Folder Configuration screen appears.
4	Action: Response: Comments:	To change the maximum number of files contained in a folder, cursor to the "Max Num of Files" field for the folder to be changed. Type the new maximum file number, and press [ENTER]. When an entry is made on the Disk Folder Configuration screen, one or more folders flash in red. The folders that flash in red are initialized when the configuration change is made (step 6) and all data in them is deleted.
5	Action: Response: Comments:	To change the folder size, cursor to the "Size in K Bytes" field for the folder to be changed. Type the new folder size, and press [ENTER]. When an entry is made on the Disk Folder Configuration screen, one or more folders flash in red. The folders that flash in red are initialized when the configuration change is made (step 6) and all data in them is deleted.
6	Action: Response:	When the disk is ready to be configured, cursor to the "Hit Enter to Configure" field, and press [ENTER]. The following message appears in red and flashes: Configuring will Cause Loss of All Data
7	Action: Response: Comments:	CAUTION Continuing this procedure causes all data located within the folders flashing in red to be lost. The data is lost forever unless the folder is stored on a backup disk or tape. Action: Press [ENTER] again to configure. Response: When the configuration is complete the new disk folder configuration appears with folders in the normal color. Comments: NOTE: If all folder types flash in red before the configuration change, the disk is not completely initialized. IMMEDIATELY initialize the disk using the Disk Initialize operation.

(continued on next page)

Table A.8. Disk File Configuration Command (continued)

Step	Operation	Description
8	Action: Response:	After the configuration change is complete, call up the Disk Event List screen by typing: DEL [ENTER] The Disk Event List screen appears. Check the Disk Event List for any configuration errors.
9	Action:	Load the backup tape made earlier. See the Tape Load operation (Procedure 1-7).
10	Action: Response:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears.
11	Action: Response:	Cursor to the appropriate tape drive or location, and press [ENTER]. The Tape Directory screen appears.
12	Action: Response:	Cursor to the "Operation" field on the Disk Activity screen. Press the [NEXT OPTION] key repeatedly until the following message appears above the "Operation" field: <code>Restore Disk Tape File to Disk</code> Press [ENTER]. The "Restore Disk Tape File to Disk" message (for all folders with the winchester disk) appears in the "Operation" field:
13	Action: Response: Comments:	Cursor to the "Press <ENTER> to Begin" field, and press [ENTER] . While the operation is in progress this field reads: <code>Operation in Progress</code> The operation is complete when the "Press <ENTER> to Begin" field reappears. The restore operation takes a few minutes to complete.
14	Action: Comments:	Power down the console and then power up the console to boot from disk. Be sure to follow the proper power down/power up procedures.
15	Action:	When the power up Diagnostic screen appears, hold down the H key (or if you are using an operator keyboard, hold down the [HARDWARE ALARM] key) until the following message appears: <code>Loading From Streaming Tape</code>
16	Action:	Release the [HARDWARE ALARM] key.

Restoring Data from Tape

You can use the following operations to restore data from tape:

- Folders or all hard disk files can be restored from tape to disk using the Restore Tape Files to Disk operation.
- Files can be restored individually from tape to disk using the Disk File Restore From Tape operation.

Restoring a Folder or All Hard Disk Files from Tape to Disk

The Restore Tape Files to Disk operation loads the files of a selected folder type onto the specified disk. The individual file names are stored on the tape. The destination disk must be a hard disk. The Restore Tape Files to Disk operation restores files from a tape to a disk, folder by folder. You can restore one or all folders that were backed up to tape with the Folder Backup operation. Tape files are not restored to duplicate file names on the disk. To load individual files to disk, see “Restoring an Individual File from Tape to Disk”. Figure A.17 shows a tape file being restored to a disk by folder.

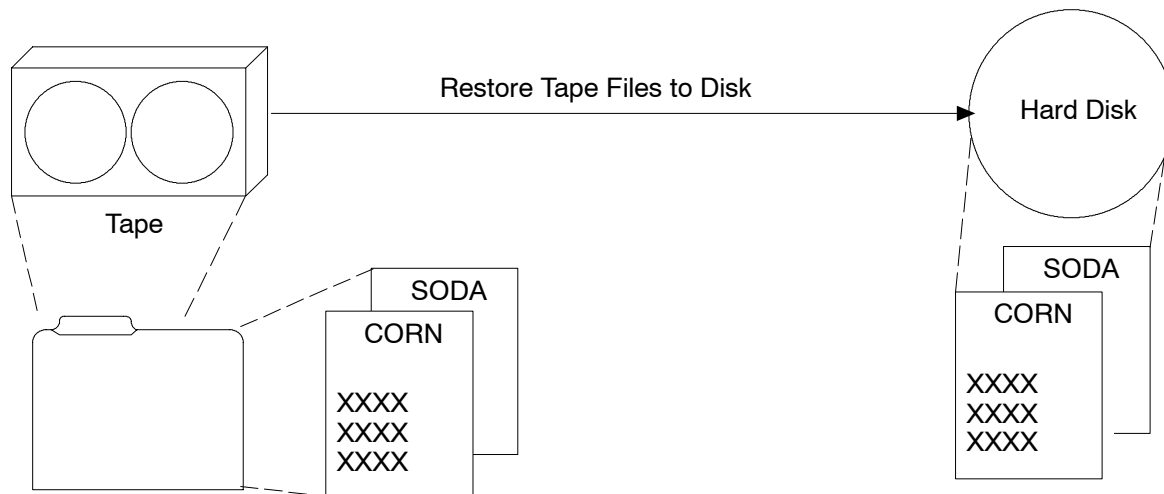


Figure A.17. Restoring a Folder or All Hard Disk Files from a Tape

Restoring an Individual File from Tape to Disk

The Disk File Restore From Tape operation loads the contents of the selected tape file back onto the hard disk as you indicate. When the tape is loaded onto the disk, the individual file names are stored on the disk with the file contents, without disturbing any files already on the disk. If a file with the same name already exists on the destination disk, you must change the existing file name or delete the file from the disk prior to restoring the file to the disk.

To restore individual files, they must have been individually backed up to tape with the Disk Backup, Disk File Backup, or Create Boot Tape operation.

The following are some examples of situations when you might want to use the Disk File Restore From Tape operation:

- To reload one or more files back onto the disk when files are lost or corrupted.
- To restore trend files back to the hard disk for viewing as historical data.

To restore files by folders, use the Restore Tape Files to Disk operation. Figure A.18 shows one individual file and a group of individual files being restored from a tape to a disk.

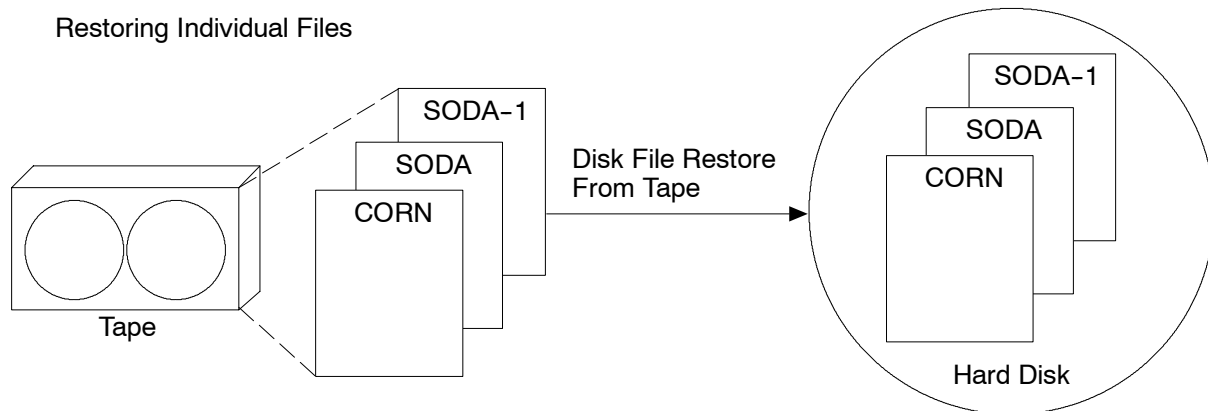


Figure A.18. Restoring Individual File(s) from Tape

Figure A.19 shows a sample Disk Activity screen for restoring tape file \$\$CB from CCTAPE3 to disk CCBOOT60. Table A.9 shows the procedure to restore an individual file or files from tape to disk.

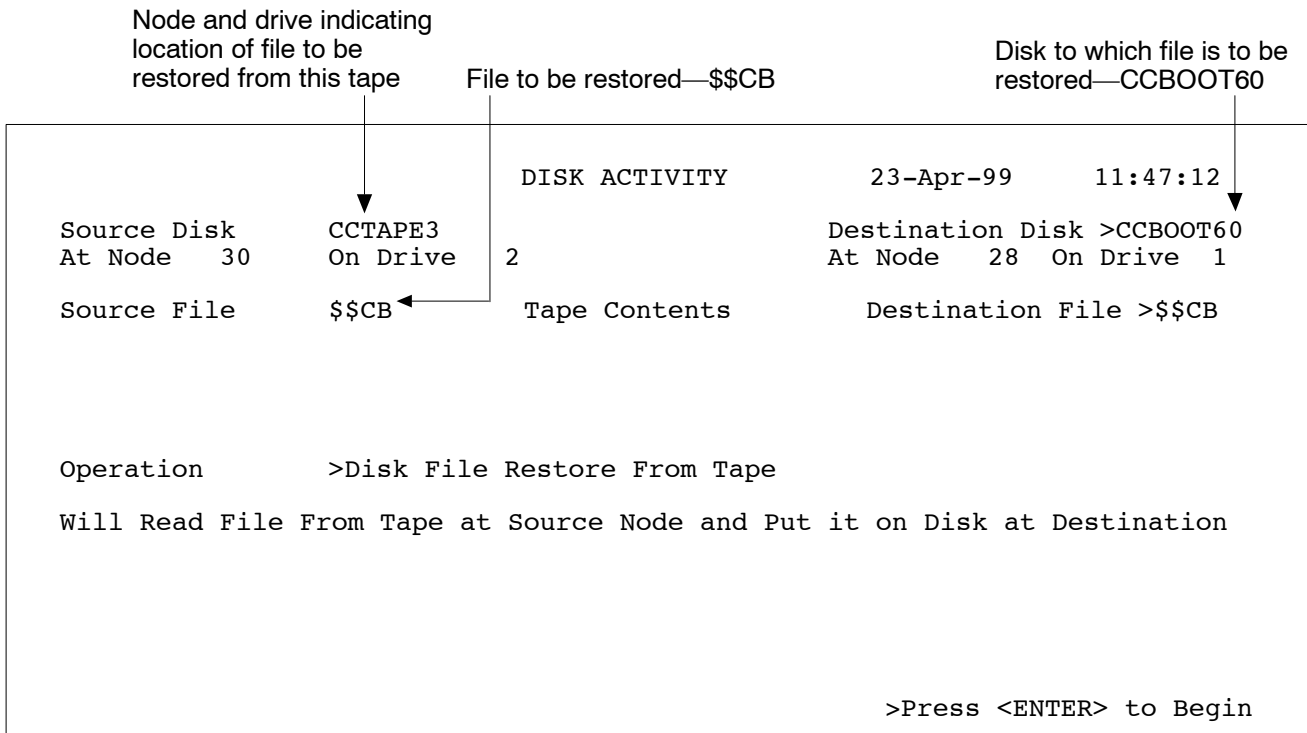


Figure A.19. Disk Activity Screen: Disk File Restore From Tape

Table A.9. Disk File Restore from Tape

Step	Operation	Description
1	Action:	See the Tape Load operation (Section 1-6) to load the tape containing the file(s) to be restored.
2	Action: Response:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears.
3	Action: Response:	Cursor to the tape name or location containing the disk file, and press [SELECT]. The Tape Directory screen appears.
4	Action: Response:	Cursor to the name of the file to be restored, and press [ENTER]. The Disk Activity screen appears.
5	Action: Response:	Cursor to the "Operation" field on the DISK ACTIVITY screen. Press the [NEXT OPTION] key repeatedly until the following message appears above the "Operation" field: Disk File Restore from Tape Press [ENTER]. The "Disk File Restore from Tape" message appears in the "Operation" field.
6	Action: Response:	Cursor to the "Destination Disk" field. Enter the disk name (or node number:drive number) for the restored file, and press [ENTER]. The destination disk name appears in the "Destination Disk" field.
7	Action: Response:	Cursor to the "Destination File" field. Enter the name of the file name to be restored, and press [ENTER]. The destination file name appears in the "Destination File" field.
8	Action: Response: Comments:	Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. The Master License Agreement is displayed. Select <CONFIRM> to continue the restore operation. While the operation is in progress, this field reads: Disk Operation in Progress The operation is complete when the "Press <ENTER> to Begin" field reappears. The operation takes several minutes to complete.
9	Action: Response:	To verify that the Disk File Restore from Tape operation was successful, call up the Disk Event List screen by typing: DEL [ENTER] The Disk Event List screen appears and the entry reads: Disk File Restore Completed, X Sector(s)

Backing Up a File to a Tape

The Disk File Backup operation copies the contents of a file on a hard disk to a file on a tape, as shown in Figure A.20. Depending on the size of the file, the Disk File Backup function takes only a few seconds to perform. Files backed up using this operation can be individually reloaded using the Disk File Restore From Tape operation.

This operation is particularly useful to make periodic copies of the contents of a specific file so that it can be reloaded if the data on the disk is lost or corrupted.

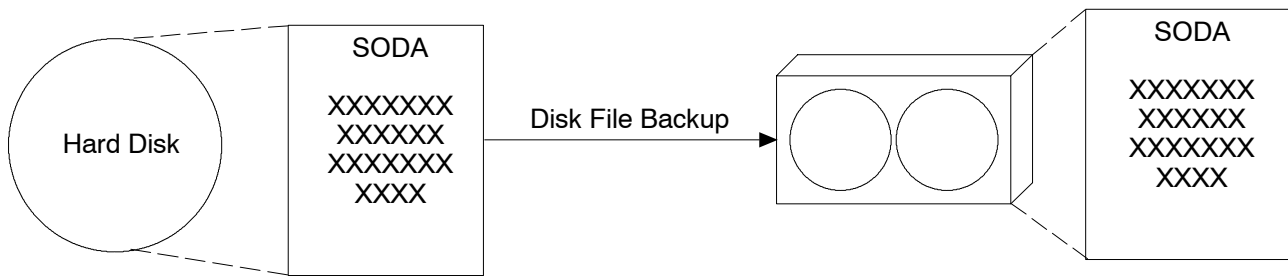


Figure A.20. Backing Up a File to a Tape

Figure A.21 shows a sample Disk Activity screen for backing up file \$\$CB to CCTAPE9. Table A.10 shows the procedure to back up a file to a tape.

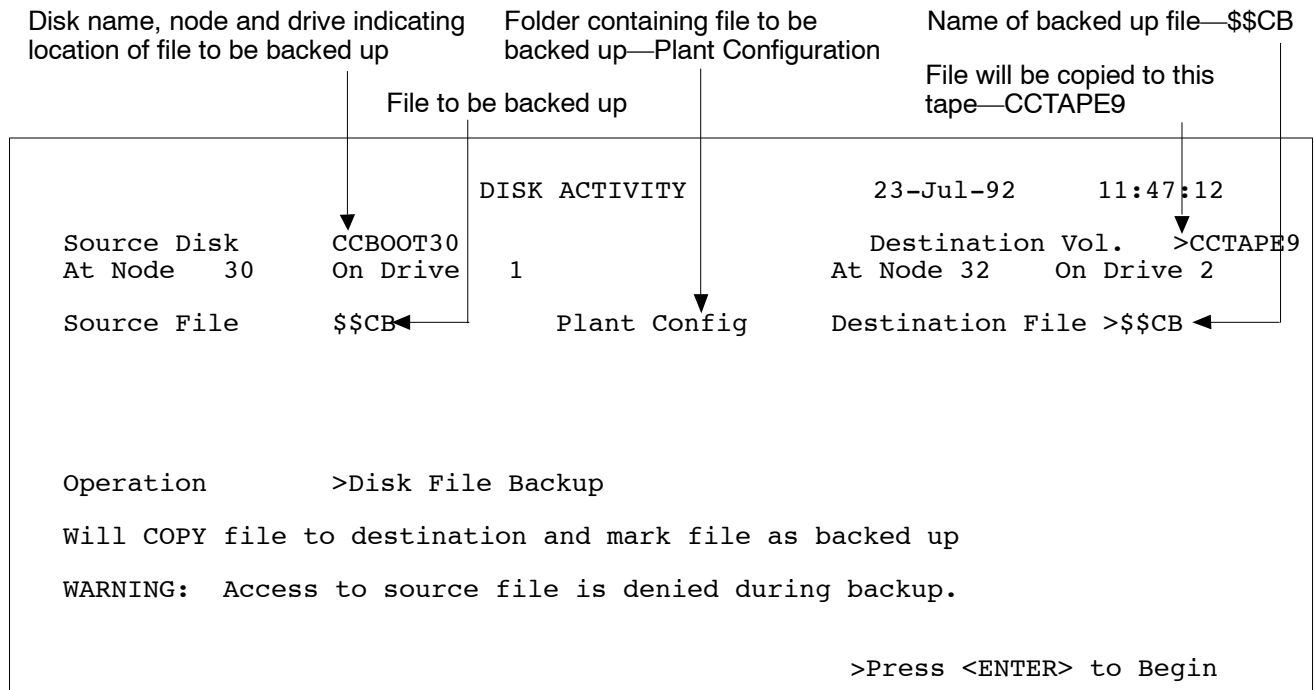


Figure A.21. Disk Activity Screen: Disk File Backup

Table A.10. Disk File Backup

Step	Operation	Description
1	Action:	To load a tape for backing up a file, see the Tape Load operation in Table A.4.
2	Action: Response:	Call up the Disk Directory PeerWay screen by typing: DDP [ENTER] The Disk Directory PeerWay screen appears.
3	Action: Response:	Cursor to the name of the hard disk containing the file, and press [SELECT]. The Disk Directory screen appears.
4	Action: Response:	Cursor to the name of the folder containing the file, and press [SELECT]. The folder Directory screen appears.
5	Action: Response:	Cursor to the name of the file to be backed up, and press [ENTER]. The Disk Activity screen appears.
6	Action: Response:	Cursor to the "Operation" field on the Disk Activity screen. Press the [NEXT OPTION] key repeatedly until the following message appears above the "Operation" field: Disk File Backup Press [ENTER]. The "Disk File Backup" message appears in the "Operation" field.
7	Action: Response:	To copy from one disk to another, cursor to the "Destination Vol." field. Type the name (or the node number:drive number) of the destination disk, and press [ENTER]. The name of the destination volume appears in the "Destination Vol." field.
8	Action: Response: Comments:	Cursor to the "Destination File" field. Type the name of a file for the backed up data, and press [ENTER]. The destination file name appears in the "Destination File" field. NOTE: If copying to a new file on the same disk, specify a different name for the duplicate file.
9	Action: Response: Comments:	Cursor to the "Press <ENTER> to Begin" field, and press [ENTER]. While the operation is in progress this field reads: Disk Operation in Progress The operation is complete when the "Press <ENTER> to Begin" field reappears. The operation takes several minutes to complete, depending on the amount of data to be copied.
10	Action: Response:	To verify that the Disk File Backup operation was successful, call up the Disk Event List screen by typing: DEL [ENTER] The Disk Event List screen appears and the entry reads: Disk File Backup Completed, X Sector(s)

FISHER-ROSEMOUNT

RS3™

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