

Manage HM Data Errors

L53924

LCN

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Acronyms

HM.....	History Module
HMI.....	History Module Initialization
HMO.....	History Module Operating
HVTS.....	Hardware Verification Test System
LCN	Local Control Network
RTJ.....	Real Time Journal
SCMD.....	Smart Controller Magnetic Disk
SMCC.....	System Maintenance Control Center
US	Universal Station

References

Publication Title	Publication Number	Binder Title	Binder Number
For R5xx: <i>History Module Service</i>	HM13-500	LCN Service	TPS 3060-2

Introduction

Module Overview

About this module	This course module introduces the techniques to recover from and work around recoverable data errors on the History Module (HM).
Objectives	Use the HM Sector Initialization/Reassignment media maintenance tool. Observe the restrictions when replacing a disk drive in a redundant drive HM configuration.
Sample test item	Provide the sequence of actions required to see the volume status of any disk drive on an HM with redundant drives.

Manage HM Data Errors

Data Error Handling and Messages

Background

Before R400, a nonredundant History Module initiated a node failure if it encountered an unrecoverable data error. The failure left the HM unavailable for subsequent access to any volume or file.

Data error handling

In R400 and later, the HM manages data errors on a file/volume basis. If the HM encounters an unrecoverable data error it remains on-line and handles the error as follows, depending on whether the drives are nonredundant or redundant:

- Nonredundant drive—The HM marks the specific file involved as “degraded” (had a data error) and the task is aborted. If a complete volume is inaccessible, the HM marks the volume “corrupted.” The HM still remains available to service the remaining good volumes.
- Redundant drive—The HM completes the task by using the duplicate copy of data from the redundant disk drive. The HM remembers and marks the volume/file as bad/corrupted for the drive with the problem.

The HM remains on-line and functional to support other good volumes/files; consequently, the user may decide to defer the HM maintenance activities until a convenient time

The functionality described above applies to all WREN I/II/III and WDA (3.5 inch) disk drives.

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Data Error Handling and Messages, Continued

Data error messages HM data error messages are sent to the system Real Time Journal (RTJ) and System Maintenance Control Center (SMCC) journals. Figure 1 shows an example of a nonrecoverable error message in the RTJ.

Whenever possible, the error messages (for data errors) provide the following essential data needed for recovery actions:

- HM node number (ex: 11)
- Disk drive number (ex: 5)
- Type of error (ex: Nonrecoverable data error)
- Bad sector number (ex: 00049408)
- Volume name (ex: !201)
- File name (ex: BB000000.CM)

Figure 1 Unrecoverable Data Error Message (example from RTJ)

```
13:40:36      NODE 11      INFORM      DISK_DRIVE 5 (OK  --> WARNING)
|
|_____ (Actually displayed on one line) _____|
|
|
NON RECOV DATA ERROR      - SECTOR 00049408 - !201>BB000000.CM
```

ATTENTION

ATTENTION—It is very important that you maintain accurate records for each drive on each HM. These records will be most valuable as you make decisions while using the new disk media maintenance tool discussed later in this course module.

Hardware requirements

HM node memory requirement:

- R400—two megawords
- R500—three megawords

WREN I and WREN II disk drives are not supported in R500.

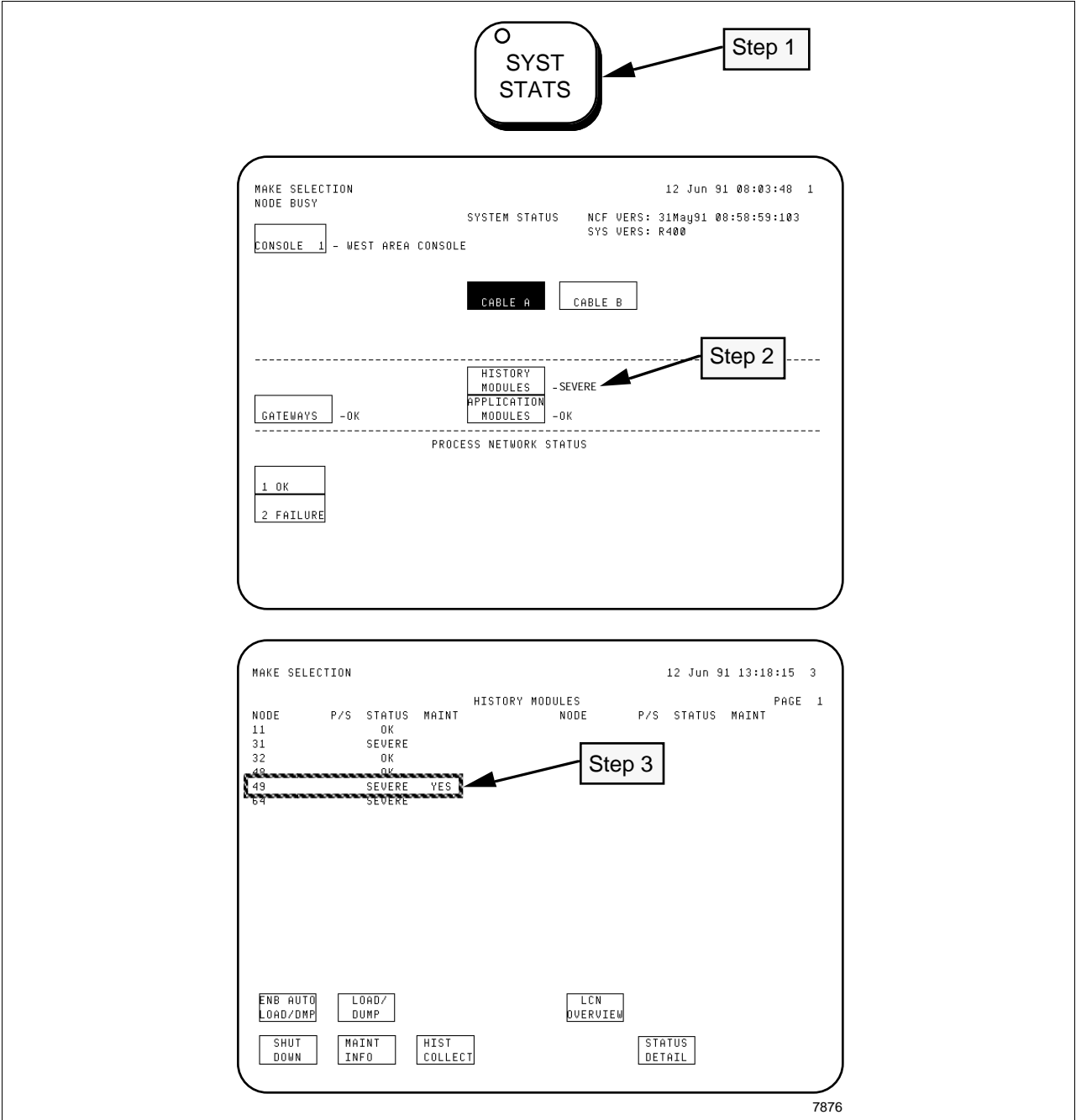
The use of WREN I disk drives for the *system* HM is not supported in R4xx; however, they can still be used for storage of user files and history data.

HM Node Status Display

Description The HM Node Status display shows the condition of all HMs on the system. Each line on the HM Status display gives the status of a separate HM on the LCN. A status column gives the specific status of each HM.

Call up procedure Figures 2 and 3 illustrate how to callup the HM Node Status display.

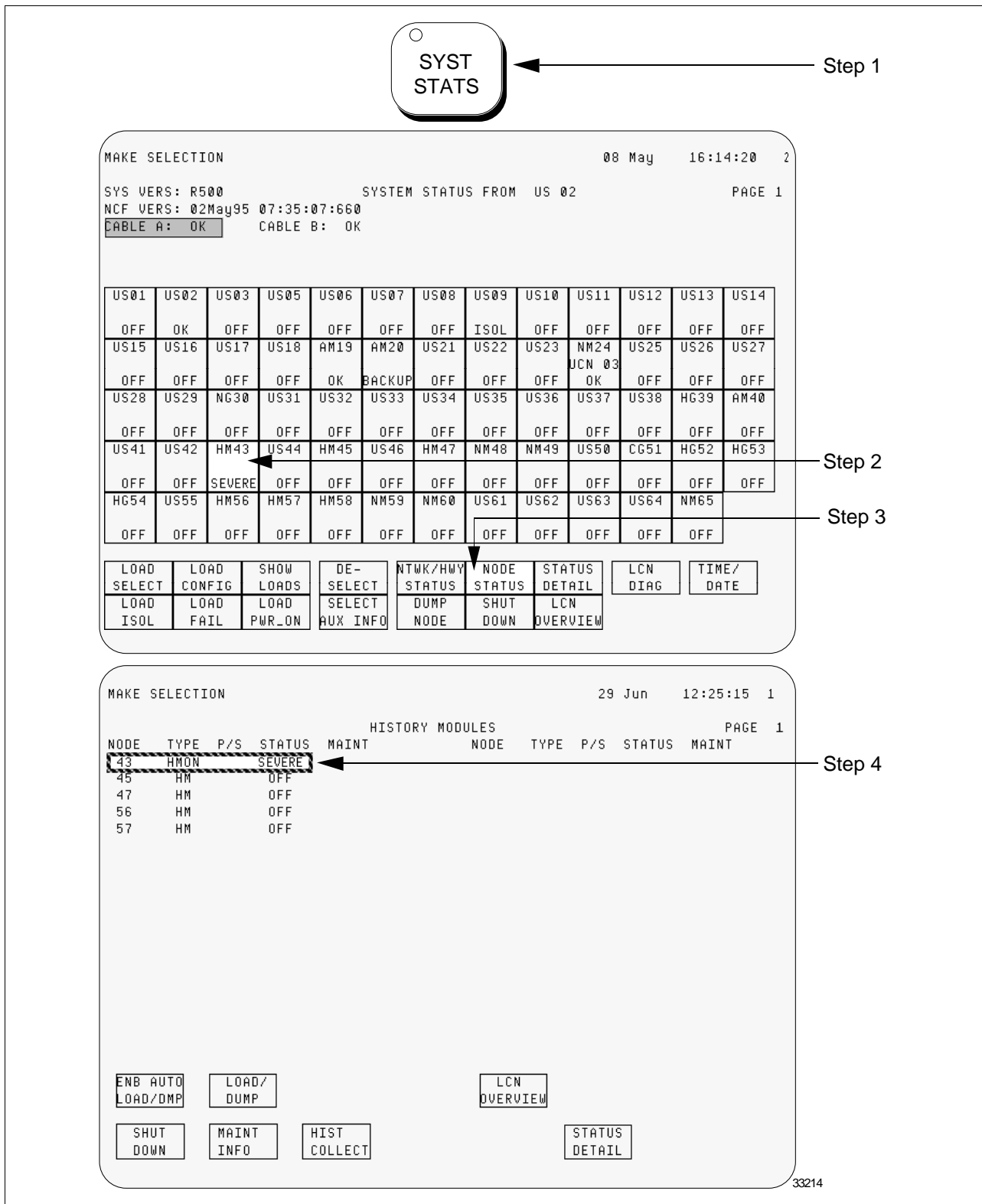
Figure 2 HM Node Status Display Callup (Before R500)



Continued on next page

HM Node Status Display, Continued

Figure 3 HM Node Status Display Callup (R500 and later)



Continued on next page

HM Node Status Display, Continued

HM statuses

The normal indication for a properly operating HM are the letters OK. Table 1 lists the statuses that may appear on the HM Node Status display.

Table 1 HM Statuses (Node Status Display)

Status	Description
OK	Qualified, loaded, and running with on-line or off-line personality.
OFF	Not physically on the LCN, or its power is off. Also displayed while HVTS (off-line test) is loaded in the node. During periods of LCN reconnect, this appears for the nodes on the bad LCN segment after autobooting the HM on the good LCN segment.
PWR_ON	The nodes power is on, but the node is not yet qualified.
QUALIF	Node has passed quality logic tests. HM changes from OK to READY to QUALIF after a manual shutdown has been executed.
NET LOAD	Node personality is being loaded from removable media.
LOC LOAD	HM is in the process of an autoboot.
TEST	Appears momentarily during autoboot, while HM is running QLTs (quality logic tests).
READY	Node passed tests and is "qualified," but not loaded.
Abnormal Status	
FAIL	Power is applied, but the node has failed.
ISOLATED	Disconnected from the token-passing scheme of the LCN as viewed by the LCN segment connected to the viewing station.
WARNING	An abnormal condition exists. Select the STATUS DETAIL target to obtain additional information.
SEVERE	A critical abnormal condition exists. Select the STATUS DETAIL target to obtain additional information.

HM type

Listed below are the *types* that may appear on the HM Node Status display.

Type	Description
HMON	The node is loaded with the &HMO on-line personality.
HMOFF	The node is loaded with the &HMI initialization personality and is considered "off-line." This personality is used to properly initialize the disk and load the desired information on the disk. Any prerecorded data is accessible through utility commands.
HM	The node is in a state other than on-line or off-line.

Continued on next page

HM Node Status Display, Continued

Autoboot states

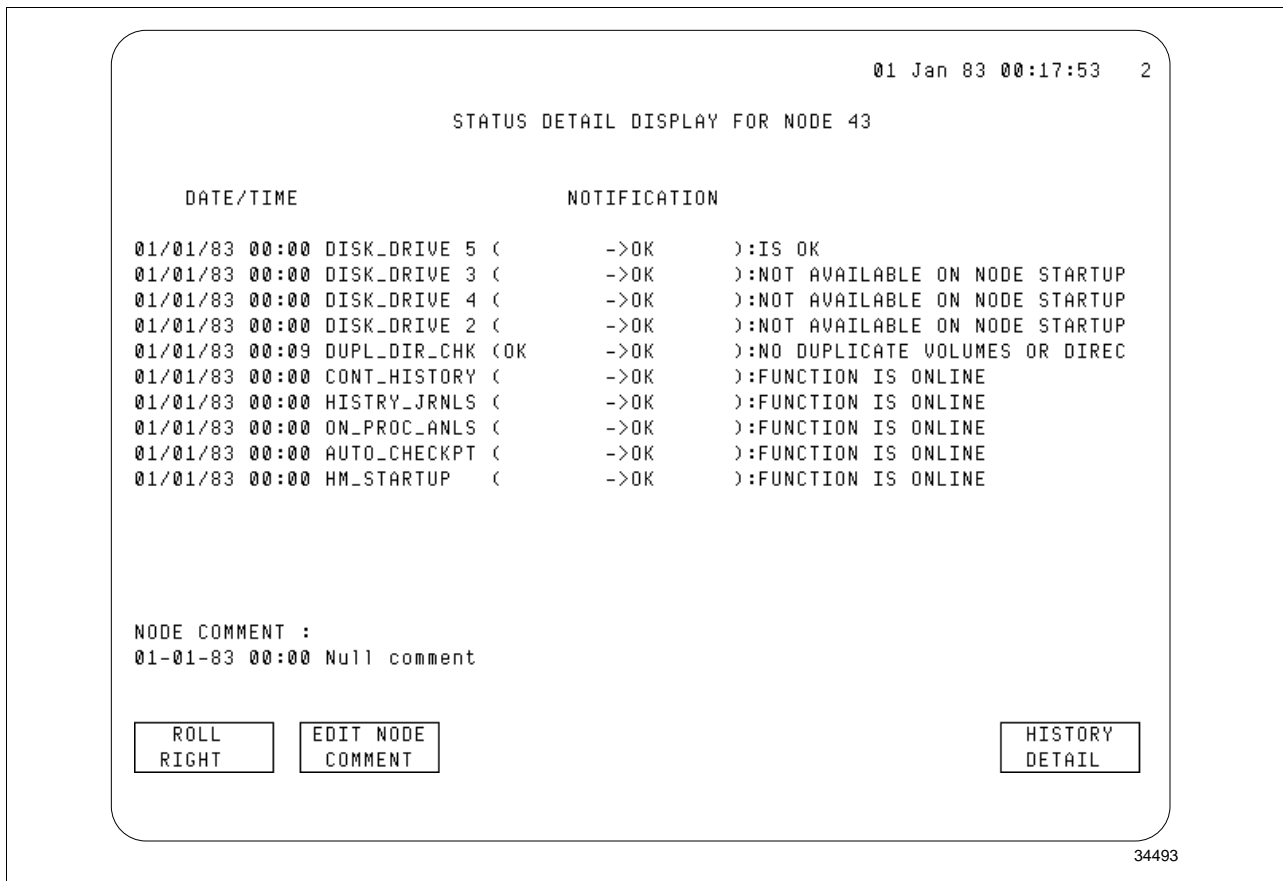
During an Autoboot, the HM changes from the FAIL or PWR_ON status, to LOC LOAD, to READY, to OK.

Status Detail target

Select a specific HM on the Node Status display, then select the **STATUS DETAIL** target to get more status information about the specific HM. (Refer to Figures 2 and 3.) The result is shown in Figure 4.

Figure 4 shows one abnormal item—the power is not applied to disk drive 3. All of the other messages are normal.

Figure 4 HM Status Detail Display



Continued on next page

HM Node Status Display, Continued

Displayed errors

One of the error messages given in Table 2 appears on the HM Status Detail display when a problem with a disk drive exists.

Table 2 Disk Drive Errors (Status Detail Display)

1	DISK CONTROLLER ERROR		
2	ERROR WITH BOTH CTL TRKS	-SECTOR xxxxxxxx	
3	NON RECOV DATA ERROR	-SECTOR xxxxxxxx	-volm>filename.ex
4	NON RECOV DEVICE ERROR	-SECTOR xxxxxxxx	-volm>filename.ex
5	NON RECOV ERR, 1 CTL TRK	-SECTOR xxxxxxxx	-volm>filename.ex
6 *	NON RECOV FAB ERROR FAB = FILE ALIAS DIRECTORY BLOCK	-SECTOR xxxxxxxx	-volm>filename.ex
7*	NON RECOV PDB PDB = PRIMARY DIRECTORY BLOCK	-SECTOR xxxxxxxx	-volm>filename.ex
8*	NON RECOV SAT ERROR SAT = SECTOR ALLOCATION TABLE	-SECTOR xxxxxxxx	-volm>filename.ex
9*	NON RECOV VVAT ERROR VVAT = VIRTUAL VOLUME ALIAS TABLE	-SECTOR xxxxxxxx	-volm>filename.ex
10*	NON RECOV VVID ERROR VVID = VIRTUAL VOLUME ID	-SECTOR xxxxxxxx	-volm>filename.ex
11	RECOV DISK DATA ERROR	-SECTOR xxxxxxxx	- volm>filename.ex
12	SYNCHRONIZE DESTIN. ERROR	-SECTOR xxxxxxxx	
13	SYNCHRONIZE SOURCE ERROR	-SECTOR xxxxxxxx	
* These errors are all directory related. Recovery must include HM initialization.			

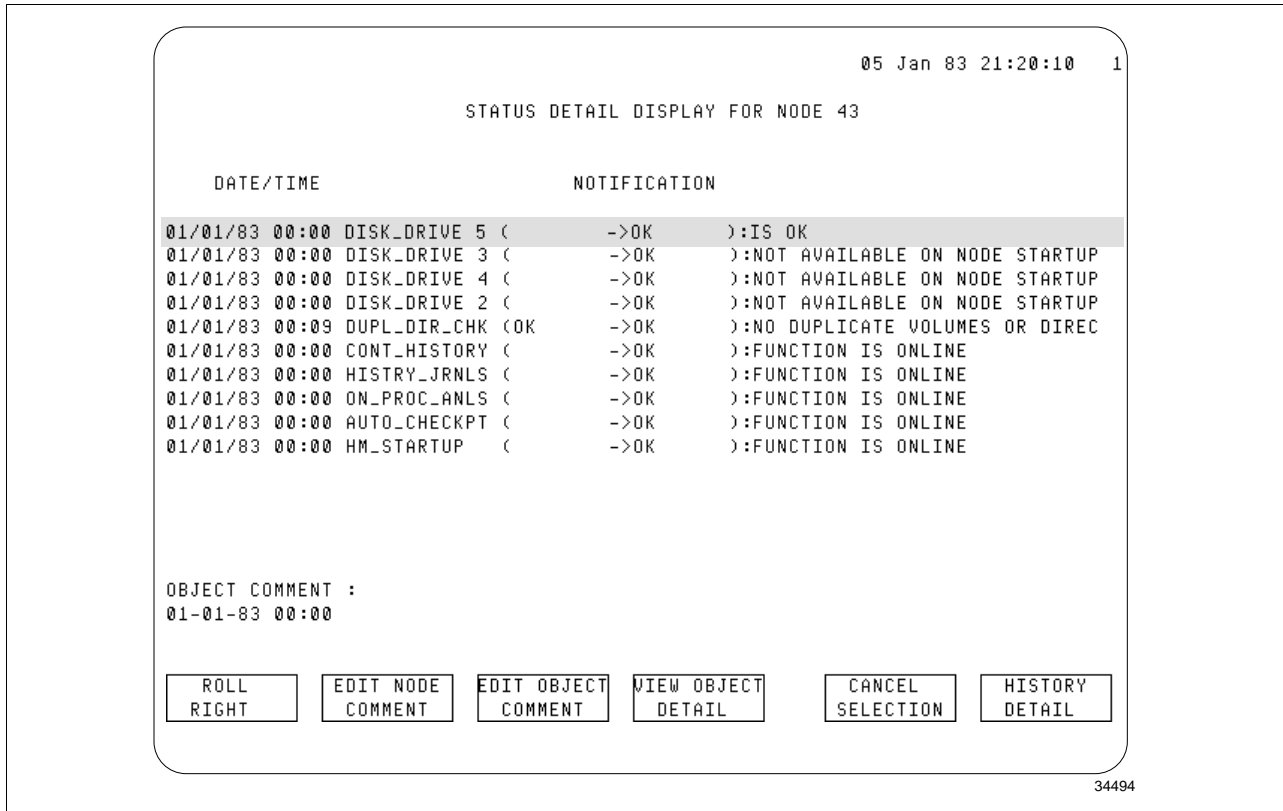
Continued on next page

HM Node Status Display, Continued

Object Detail target

Selecting any line that describes the condition of a disk drive produces a **VIEW OBJECT DETAIL** target at the bottom.

Figure 5 HM Status Detail Display With Object Selected



Volume Status display

Selecting the **VIEW OBJECT DETAIL** target produces a 2-page display describing the state of each of the four possible disk drives and the volumes stored on each drive.

The display can be most helpful when trying to see which, if any, volumes have been flagged as corrupted (complete volume cannot be accessed) or degraded (one or more files cannot be accessed) by the HM software.

The example shown in Figures 6 is an HM with a single WREN III drive. Notice that all volumes for drive 5 are flagged as OK in the example display.

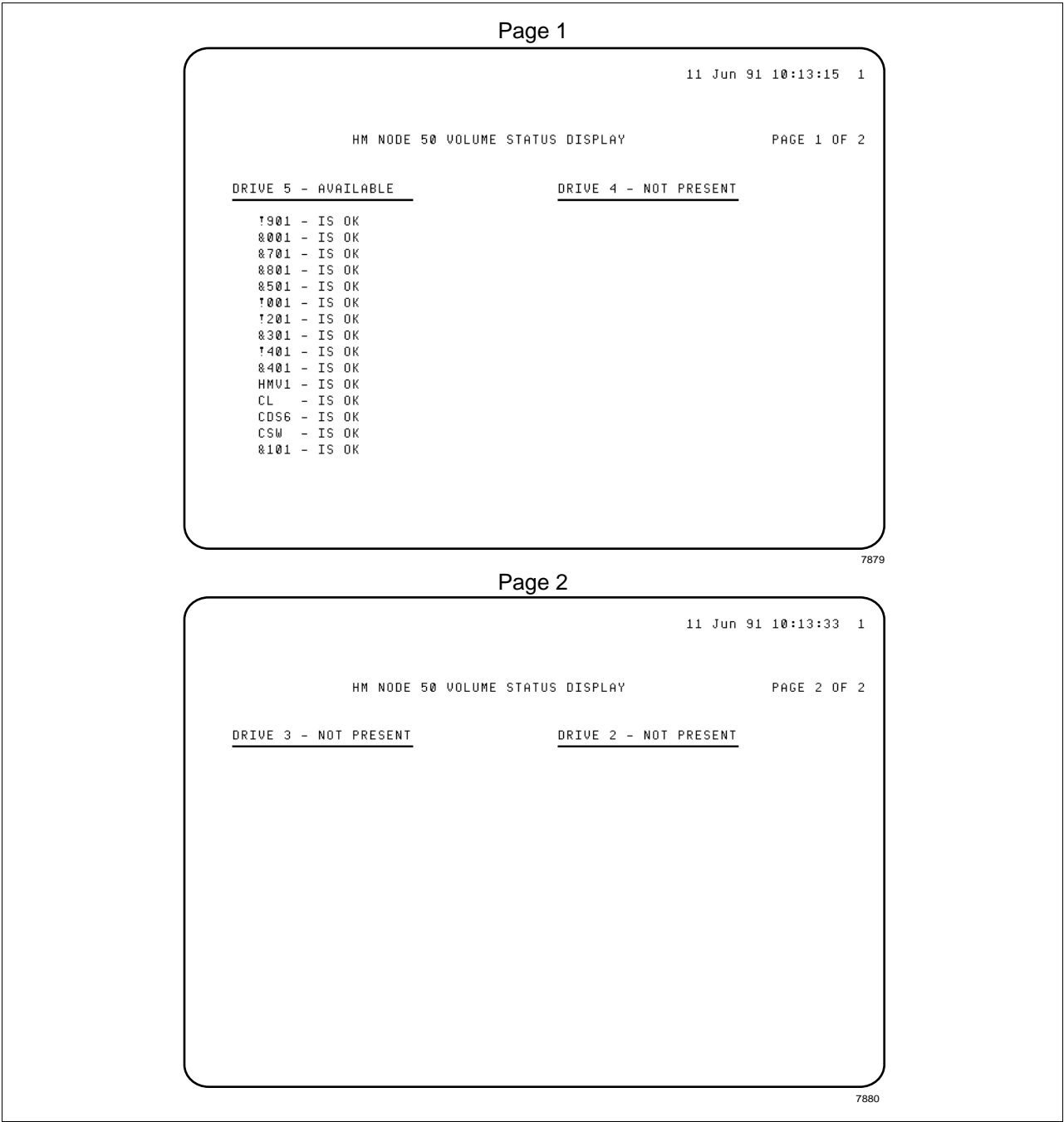
The possible HM drive numbers are

- WREN/II drives — 0 and 1
- WREN III and WDA — 2, 3, 4, and 5.

Continued on next page

HM Node Status Display, Continued

Figure 6 Volume Status Display



Media Maintenance

Sector initialization and reassignment

A tool for disk drive media (recording surface) maintenance provides the capability for on-line sector initialization (write zeros) and sector reassignment (to bad sector list). It can be used with WREN III and WDA (3.5 inch) disk drives, and all R500 supported disk drives.

You access the tool through the SMCC function.

Existing R300 techniques for recovery from unrecoverable data errors must be used for WREN I/II drives. These techniques consist of using the off-line Hardware Verification Test System (HVTs) for the purpose of reassigning the bad sector to the bad sector table and then performing a complete HM initialization and data reload.

Scenario for redundant drives

The basic steps to reinitialize a bad sector for redundant disk drive HM configurations are:

1. Set the device with the media problem off-line, using the OFFLINE command with the Command Processor.
2. Use the SMCC tool to initialize the bad sector
3. Synchronize the drive using the SYNCH command with the Command Processor. This data synchronize process brings the drive back on-line if the data synchronization is successful (no errors).
4. You can watch the synchronization progress from volume to volume by observing the Volume Status display, which is accessed through the selection of the **VIEW OBJECT DETAIL** target on the Status Detail display.
5. Watch for error messages on the RTJ. No errors are expected during synchronization.

ATTENTION

ATTENTION—Reassign the bad sector if the synchronization is unsuccessful and use the SYNCH command again.

The drive needs to be replaced if the synchronization is unsuccessful after reassigning the bad sector.

It could be remotely possible that an additional adjacent sector must be reassigned to recover from a single problem.

ATTENTION

ATTENTION—Keep detailed records with respect to media maintenance activities.

Continued on next page

Media Maintenance, Continued

Synch command

The SYNCH command causes a synch operation to start and continue through both drives (if dual redundant drives exist).

The synch operation works on a volume by volume basis, examining both the primary and secondary (redundant) drives. The result is that the drive with the most current good data serves as the data source if the volumes on the drives are found to be different. If a volume exists on one drive and not on the other, an attempt is made to copy the volume to the other drive. (This is why new drives introduced into the system must be newly formatted.)

Scenario for nonredundant drives

The basic steps to reinitialize a bad sector for nonredundant disk drive HM configurations are:

1. Load the HM with the HMI personality software.
 2. Use the SMCC tool to initialize the bad sector (or reassign to the Bad Sector List).
 3. Restore the bad file from an alternate source. The volume and file names are given in the RTJ error message whenever possible.
 4. Load the HMO personality software.
-

ATTENTION

ATTENTION—The above technique will not work for the cases where the complete volume is bad (corrupted) or if the file is from one of the following active categories:

- Maintenance System Software
- Journal
- Continuous History

In these cases, do the following:

1. First, save as much HM data as possible.
 2. Then, reassign the bad sector if it is known.
 3. Follow this with an HM disk initialization and restore operation to recover.
-

Drive formatting

Formatting a drive in the field should be avoided whenever possible. If formatting cannot be avoided, you must always configure the SCMD (test 21) under HVTS to keep (and append to) the existing bad sector list. This means all of the bad/marginal sectors found previously are definitely not reintroduced during the format.

Continued on next page



REFERENCE—The following manual includes detailed recovery procedures for *unrecoverable* data errors.

History Module Service, binder TPS 3060-2

Replacing a Redundant Drive

Purpose

The normal method of replacing a defective redundant drive is to change it while the HM continues on-line with the remaining good drive.

CAUTION

CAUTION—The replacement drive must be in a newly formatted (blank) condition. Replacement drives from Honeywell arrive in this condition (blank). Replacements brought from another system must first be formatted using HVTs before attempting a SYNCH command.

Basic steps

Table 3 describes the basic steps to replace a redundant drive.

Table 3 Basic Steps to Replace a Redundant Drive

Step	Action
1	Place the redundant drive to be replaced off-line by using the Command Processor. Be sure to place both drives in the same chassis off-line if dual redundant drives are present.
2	Turn the power off to the drive power supply in the chassis containing the redundant drive to be replaced.
3	Replace the drive and pin (drive options) it properly.
4	Turn the power on the drive power supply in the chassis containing the new drive.
5	Use the Command Processor to issue the SYNCH command that places a duplicate copy of data (obtained from the drives working partner) on the new drive.

ATTENTION

ATTENTION—There is no need to issue a SYNCH command for the possible second redundant disk drive that also had the power turned off during the replacement of one drive. The SYNCH command automatically goes through both redundant drives and places both drives on-line after the synchronization of data is successfully completed.

HM initialization

Redundant drives must be on-line and fully synchronized before an HM initialization effort is begun. The power on the secondary (redundant) drive must not be turned off during any portion of the HM initialization process. Doing so can create drives with a different volume structure, which causes problems when a subsequent SYNCH command is issued.

Sector Initialization/Reassignment

Description

To access the tool to initialize and reassign bad sector

- Select the System Maintenance Control Center (SMCC) target from the Engineering Main Menu. The display that appears (SMCC Main Menu) is shown at the top of Figure 7.
- Select the **SECTOR INIT./REASSIGN** target. The display shown at the bottom of Figure 7 appears.

Figure 7 SMCC Main Menu Display

12 Jun 91 13:52:01 2

SMCC MAIN MENU

MODULE MEMORY

HIWAY BOX MEMORY

PROBE FAILED MODULE

SYSTEM MAINT JOURNAL

ACTIVE MAINT JOURNAL

MODULE ERROR

REV/CONFIG STATUS

SECTOR INIT./REASSIGN

MAIN MENU

For Information On Functions And Options Displayed On This Menu,
Position The Cursor On The Desired Target And Press HELP.

12 Jun 91 14:03:59 2

SECTOR INITIALIZATION/REASSIGNMENT

ENTER PARAMETERS -

ENTER Module Number : (1 To 96)

ENTER Drive Number : (0 To 7)

ENTER Sector Number : (1 To 99999999)

ENTER Sector Initialize/Sector Reassign : (I or R)

WARNING - Use of Function Will Permanently Reassign Sector on the Requested HM.
This Should Only Be Used After Receipt of a System Message Requesting
Action Be Taken Against a Specific HM Drive.

For Information On Functions And Options Displayed On This Menu,
Position The Cursor On The Desired Target And Press HELP.

Continued on next page

Sector Initialization/Reassignment, Continued

CAUTION

CAUTION—Optimum care must be exercised when entering data for sector reassignment. Once a sector is added to the Bad Sector List, it cannot be recovered.

Parameter Entry

Table 4 describes the parameters that must be entered on the Sector Initialization/Reassignment display. Obtain the data that needs to be entered from the HM error message on the system RTJ.

Table 4 Parameters for Sector Initialization/Reassignment

Parameter	Definition
MODULE NUMBER	LCN number of the HM
DRIVE NUMBER	Specific disk drive number in the HM
SECTOR NUMBER	Sector number as provided in the error message
INITIALIZE/REASSIGN	I = Initialize sector (write zeros) R = Reassign sector to Bad Sector List

Continued on next page

Sector Initialization/Reassignment, Continued

Entry verification and execution

After typing in the parameters, press the RETURN key. The verification display shown in Figure 8 appears.

Select the **YES** target to cause the initialization or reassignment to be performed. Selecting the **NO** target effectively cancels your request.

Figure 8 Sector Initialization/Reassignment Verification Display

```
12 Jun 91 14:05:22 2
SECTOR INITIALIZATION/REASSIGNMENT

ENTER PARAMETERS -

ENTER Module Number : 11      (1 To 96)
ENTER Drive Number  : 2       (0 To 7)
ENTER Sector Number : 123455  (1 To 99999999)

ENTER Sector Initialize/Sector Reassign : I (I or R)

VERIFY THAT THE DATA ENTERED IS CORRECT?  YES  NO

WARNING - Use of Function Will Permanently Reassign Sector on the Requested HM.
This Should Only Be Used After Receipt of a System Message Requesting
Action Be Taken Against a Specific HM Drive.

For Information On Functions And Options Displayed On This Menu,
Position The Cursor On The Desired Target And Press HELP.
```

Output messages

One of three possible messages is output on the HM Detail Status display at the conclusion of the operation. The messages are

Disk yy Sector zzzzzz has been initialized.

Disk yy Sector zzzzzz has been reassigned, data recovered.

Disk yy Sector zzzzzz has been reassigned, data not recovered.

In some cases, the attempt to initialize a bad sector results in a message saying the drive is in use. In this case, do the following

1. Cycle the drive power off for a few seconds and then on again.
2. Retry the initialize operation.

Lab Exercise

Lab Overview

Lab overview

This lab consists of three exercises:

Lab Exercise 1—Access HM Displays

Lab Exercise 2—Initialize/Reassign Bad Sector (redundant drives)

Lab Exercise 3—Initialize/Reassign Bad Sector (nonredundant drives)

For Lab Exercises 2 and 3, you will only “go through the motions” of initializing/reassigning a bad sector.

Perform either lab exercise 2 or 3, depending on what equipment you have at your site. If you have both types of HMs, you may choose to do both lab exercises.

Duration

The time required for exercise 1 and either 2 or 3 is approximately 30 minutes.

Requirements

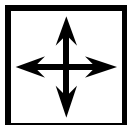
Required Equipment

For this lab, you need an HM with WREN III or WDA drives. Redundant and nonredundant drive exercises are available. You must select the HM type to meet their needs. Consult with your course manager to determine which HM you are to use.

Required Media

(The following media is required only if you plan to do lab exercise 3 for nonredundant HM drives)

- One “scratch” cartridge
- A recovery copy of file BB000000.CM in Volume !201.



DIRECTIONS—These lab exercises require that the HM be loaded with the HMO (online) personality software (status OK). If it is not, load it before you continue.

Lab Exercise 1—Access HM Displays

System Status display

Step	Action
1	Obtain the System Status Display by pressing the [SYST STATS] key
2	Observe the display. Note the status for the HMs. This status could be any of those shown in Table 1 of this course module.

HM Status display

Step	Action
1	Select any one of the History Modules.
2	Select the NODE STATUS target.
3	Observe the display. Note the status for each HM.

Status Detail Display

Step	Action
1	Select your assigned HM.
2	Select the STATUS DETAIL target.
3	Observe the Status Detail display. Compare it to Figure 4 in this module. It may be similar to, but not the same as Figure 4, depending on your actual hardware. Table 3 of this module shows all of the possible disk drive errors.

Volume Detail display

Step	Action
1	Select one of the lines that provides disk drive status information.
2	Select the VIEW OBJECT DETAIL target
3	Observe the Volume Detail display. Note the status for all of the volumes on your HM. The status is expected to be OK. They could be one of the following: Had Data Error (volume has one or more files with an unrecoverable data error) Corrupted (entire volume is bad) SYN_IP (Synchronization in process)

Continued on next page

Lab Exercise 1—Access HM Displays

Scenario

Assume the following situation:

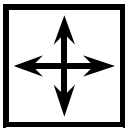
- The HM has been functioning properly for a long time.
- The following message has just printed on the RTJ:

13:40:36 NODE 11

INFORMDISK_DRIVE 5 (OK --> WARNING)

(Actually displayed on one line)

: NON RECOV DATA ERROR - SECTOR 00049411 - !201>BB000000.CM



DIRECTIONS—Substitute the node number of your practice HM for the node number specified in the above error message. *Cross out the 11 and write the node number of your HM.*

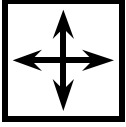
Check HM volume status

Determine if disk drive redundancy exists. Remember—drives 5 and 4 are the first redundant pair. Drives 3 and 2 are the second redundant pair.

Step	Action
1	Obtain the System Status Display by pressing the [SYS STATS] key
2	Select your assigned HM.
3	Select the STATUS DETAIL target.
4	Select one of the lines that provides disk drive status information.
5	Select the VIEW OBJECT DETAIL target
6	Check both pages (four drives) for the possibility that volumes are flagged other than OK.

If the given error message were real (not assumed), you would see the !201 volume marked as DEGRADED or possibly CORRUPTED (complete volume not accessible) on drive 5.

End of lab exercise 1



The next lab exercise, acquaints you with the process of initializing or reassigning a bad sector.

Do only the lab exercise that applies to the equipment at your site.

Lab Exercise 2—redundant drives

Lab Exercise 3—nonredundant drives

Lab Exercise 2—Initialize/Reassign Sector (redundant drives)

Introduction

This exercise is limited to redundant disk drives.
Skip this exercise if you do not have redundant drives at your site. Lab Exercise 3 for nonredundant drives follows this exercise.

Check drive status

Begin the recovery process by using utility commands (Command Processor) to check the HM drive status.

Command	Result
STA NET [ENTER]	This command displays the disk drive status of each HM on the LCN.

If the drive in question (per given error message) is not off-line, place it off-line using the following command syntax:

Command	Result
OFFLINE PN:nn x [ENTER] (where nn = LCN node number and x = the disk drive number)	This command places the drive off-line.

Check the drive status again by using the STA NET command. It should now be off-line.

Access Sector Init/Reassign display

Step	Action
1	Select the SMCC/MAINTENANCE target on the Engineering Main Menu.
2	Select the SECTOR INIT./REASSIGN target.

Input parameters

Step	Action
1	Module number = LCN number of the HM
2	Drive number = 5 (obtained from RTJ message)
3	Sector number = 00049411 (obtained from RTJ message.)
4	Initialize/Sector reassign = R Note: an "I" at this point would only initialize the sector
5	Check your entries for accuracy
6	Press the [ENTER] key.

Continued on next page

Lab Exercise 2—Initialize/Reassign Sector (redundant drives),

Continued

CAUTION

CAUTION—You have just reached the point of no return. The warning in the previous display indicated that you will permanently lose the reassigned sector.

This is your last chance to double check to see if the HM, Drive, and Sector numbers are correct.

CAUTION

CAUTION—For the purpose of this lab, **stop here!** The sector has not been reassigned. We do not want to permanently lose the sector on your practice HM; therefore, **do not** select the yes answer in the display. Please continue reading.

Completion message

One of following messages would be displayed on the HM Detail Status display if the operation completed:

- Disk yy Sector zzzzzz has been initialized
- Disk yy Sector zzzzzz has been reassigned, data recovered
- Disk yy Sector zzzzzz has been reassigned, data not recovered

In some cases, the attempt to initialize the bad sector results in a message saying the drive is in use. In this case, cycle the drive power off for a few seconds and then on again; then, retry the initialize operation.

Exit

The following forces an exit from the SMCC.

Step	Action
1	Press the "Control/Help" key now. It causes an immediate exit from the SMCC function and returns you to the Engineering Main Menu.

Continued on next page

Lab Exercise 2—Initialize/Reassign Sector (redundant drives),

Continued

Drive synchronization

For this lab exercise, assume that the preceding sector reassignment was done and consequently the data file involved was lost. The drive in question must be synchronized with its redundant partner.

Synchronize the drive on which you reassigned the sector by using SYNCH command with the Command Processor:

```
SYNCH PN:nn [ENTER]
```

(Where nn = the LCN node number)

The synch operation can take up to 45 minutes or more. This depends on drive size and on how busy the HM is with higher priority tasks. The activity on both disk drives can be seen by the flashing drive select indicator on the front of the drives.

The Synch process progress can be observed on the Volume Status display which is accessed by selecting the **VIEW OBJECT DETAIL** target on the HM Status Detail target. It can also be observed from the DRVSTS display on page 2 of the PERFMENU.

Synch status

The STA PN:nn command can also be used at periodic intervals to track the synch activity.

The drive shows as OK when the synch operation successfully finishes.

End of lab exercise 2

Lab Exercise 3—Initialize/Reassign Sector (nonredundant drives)

Introduction

This exercise is limited to nonredundant disk drives

Skip this exercise if you have redundant drives at your site. Lab Exercise 2 is for redundant drives.

Change HM personality to HMI

For an HM with *nonredundant drives*, the recovery from this error situation requires that the HM with the bad sector be loaded with the HMI (offline/Initialize) personality.

There are two possible ways of loading the HMI offline personality. If it is configured in the network Local Volume, an HM personality change is possible. If the HMI (offline) personality is not configured on the network Local Volume, it must be loaded into the HM from removable media. We assume that the HMI (offline) personality is available from the network.

Load the HMI (offline) personality from the HM Node Status display.

Step	Action
1	Obtain the HM Status display by Selecting the History Module on the System Status Display.
2	Select the NODE STATUS target.
3	Select the bad HM.
4	Select the LOAD/DUMP target.
5	Select the MANUAL LOAD target.
6	Select the INIT PROGRAM target
7	Select the DEFAULT and EXECUTE targets for the program source.
8	Select the DEFAULT and EXECUTE targets for the data source.
9	Press the [ENTER] key. The HM should perform a local load and successfully arrive in the HMOF state.

Continued on next page

Lab Exercise 3—Initialize/Reassign Sector (nonredundant drives), Continued

Restore of lost data

For this lab exercise, assume that the preceding sector reassignment was done and consequently the data file involved was lost. The file in question must be restored from a backup source

Obtain the recovery cartridge needed to restore the lost file (BB000000.CM) in Volume !201. Your course manager will provide the media for this purpose.

Step	Action						
1	Insert the recovery cartridge into the lower numbered drive.						
2	<p>Restore the missing file to your HM. Use the following copy command syntax:</p> <pre>CP \$Fn>!201>BB000000.CM PN:nn>!201>= -V [ENTER]</pre> <p>Where</p> <table><tr><td>n</td><td>=</td><td>the cartridge drive number</td></tr><tr><td>nn</td><td>=</td><td>the HM LCN node number</td></tr></table>	n	=	the cartridge drive number	nn	=	the HM LCN node number
n	=	the cartridge drive number					
nn	=	the HM LCN node number					

Verify restored data

Verify that the restored file can be accessed without error by doing a copy to a scratch cartridge.

Step	Action									
1	Mount the “scratch” cartridge into the lower number drive									
2	<p>Use the following command syntax to copy the file in question onto the scratch medium.</p> <p>1. CR \$Fn>!201 [ENTER]</p> <p>2. CP PN:nn>!201>BB000000.CM \$Fn>!201>= -v [ENTER]</p> <p>Where</p> <table><tr><td>n</td><td>=</td><td>cartridge drive number</td></tr><tr><td>np</td><td>=</td><td>node pair number of the HM</td></tr><tr><td>nn</td><td>=</td><td>the HM LCN node number</td></tr></table>	n	=	cartridge drive number	np	=	node pair number of the HM	nn	=	the HM LCN node number
n	=	cartridge drive number								
np	=	node pair number of the HM								
nn	=	the HM LCN node number								
3	An error-free copy to the removable media verifies that the problem on the HM has been corrected.									

Continued on next page

Lab Exercise 3—Initialize/Reassign Sector (nonredundant drives), Continued

Change HM personality to HMO

Step	Action
1	Obtain the HM Status display by Selecting the History Module on the System Status Display.
2	Select the NODE STATUS target.
3	Select the bad HM.
4	Select the LOAD/DUMP target.
5	Select the MANUAL LOAD target.
6	Select the OPERATOR PROGRAM target
7	Select the DEFAULT and EXECUTE targets for the program source.
8	Select the DEFAULT and EXECUTE targets for the data source.
9	Press the [ENTER] key. The HM should perform a local load and successfully arrive in the OK state.

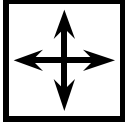
Recovery of lost sectors

You should understand that the sequence followed in this exercise results in a quick fix of the problem. Some of the sectors associated with the original file are lost out of the sector allocation table. They can be recovered only by doing the following steps in order.

The steps for recovery of the possible lost sectors can be deferred until some convenient time.

Step	Action
1	Do a complete save of the data on the specific HM (System, User, and Continuous History files).
2	Perform an HM initialization.
3	Restore the HM data (System, User, and Continuous History files). Note that the file on the corrupted sector will have to be restored from an alternate source that contains an uncorrupted copy of the file.

End of lab exercise 3



DIRECTIONS—This is the end of the study material for this course module. Discuss questions concerning the study material or the lab activities with a colleague or a course manager

If you are satisfied that you have achieved the objectives of this module, continue with the next section, the Student Proficiency Evaluation.

Student Proficiency Evaluation

Criterion Test

Given scenario

The HM has dual redundant disk drives.

The HM has been operating problem-free for a very long time.

The System Status and HM Node Status displays have just displayed a WARNING status for this HM.

The following message has been output on the RTJ:

```
13:40:36 NODE 31          INFORMDISK_DRIVE 5 (OK --> WARNING)
```

(Actually displayed on one line)

```
: NON RECOV DATA ERROR  - SECTOR 00032508 - !201>BB000000.CM
```

Sequence the following steps so that they reflect the proper initial recovery procedure for this situation.

Step	Action
	Observe any errors that may occur during the sync operation rendering it unsuccessful.
	Verify that the sync operation is complete by periodically checking the drive status using Command Processor commands.
	Use a Command Processor command to set disk drive 5 to the Off-Line state.
	Use a Command Processor command to synchronize drive 5 with its redundant partner.
	Use the SMCC function to initialize the identified sector.

Continued on next page

Criterion Test, Continued

HM status access

Provide the sequence of actions required to see the volume status on any disk drive of a redundant drive HM. The first step has been identified for you

Step	Action
1	Obtain the System Status Display by pressing the [SYST STATS] key
2	
3	
4	
5	
6	
7	

Self-Evaluation

Given scenario

Sequence the following steps so that they reflect the proper initial recovery procedure for this situation.

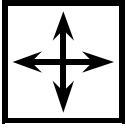
Step	Action
4	Observe any errors that may occur during the sync operation rendering it unsuccessful.
5	Verify that the sync operation is complete by periodically checking the drive status using Command Processor commands.
1	Use a Command Processor command to set disk drive 5 to the Off-Line state.
3	Use a Command Processor command to synchronize drive 5 with its redundant partner.
2	Use the SMCC function to initialize the identified sector.

HM status access

Provide the sequence of actions required to see the volume status on any disk drive of a redundant drive HM. The first step has been identified for you

Step	Action
1	Obtain the System Status Display by pressing the [SYS STATS] key
2	Select the History Module.
3	Select the NODE STATUS target.
4	Select your assigned HM.
5	Select the STATUS DETAIL target.
6	Select one of the lines that provides disk drive status information.
7	Select the VIEW OBJECT DETAIL target
8	Check both pages (four drives) for the possibility that volumes are flagged other than OK.

Directions



DIRECTIONS—This is the end of this course module.

Use your course map to

- Get your course manager to sign off this module.
- Choose your next eligible module.

If you have a question

- Ask your course manager.
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LAST PAGE

