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IBM Disk Storage Management Guide, Error Handling

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This Technical Newsletter provides replacement pages for the subject publication. Pages to be inserted and/or replaced are:

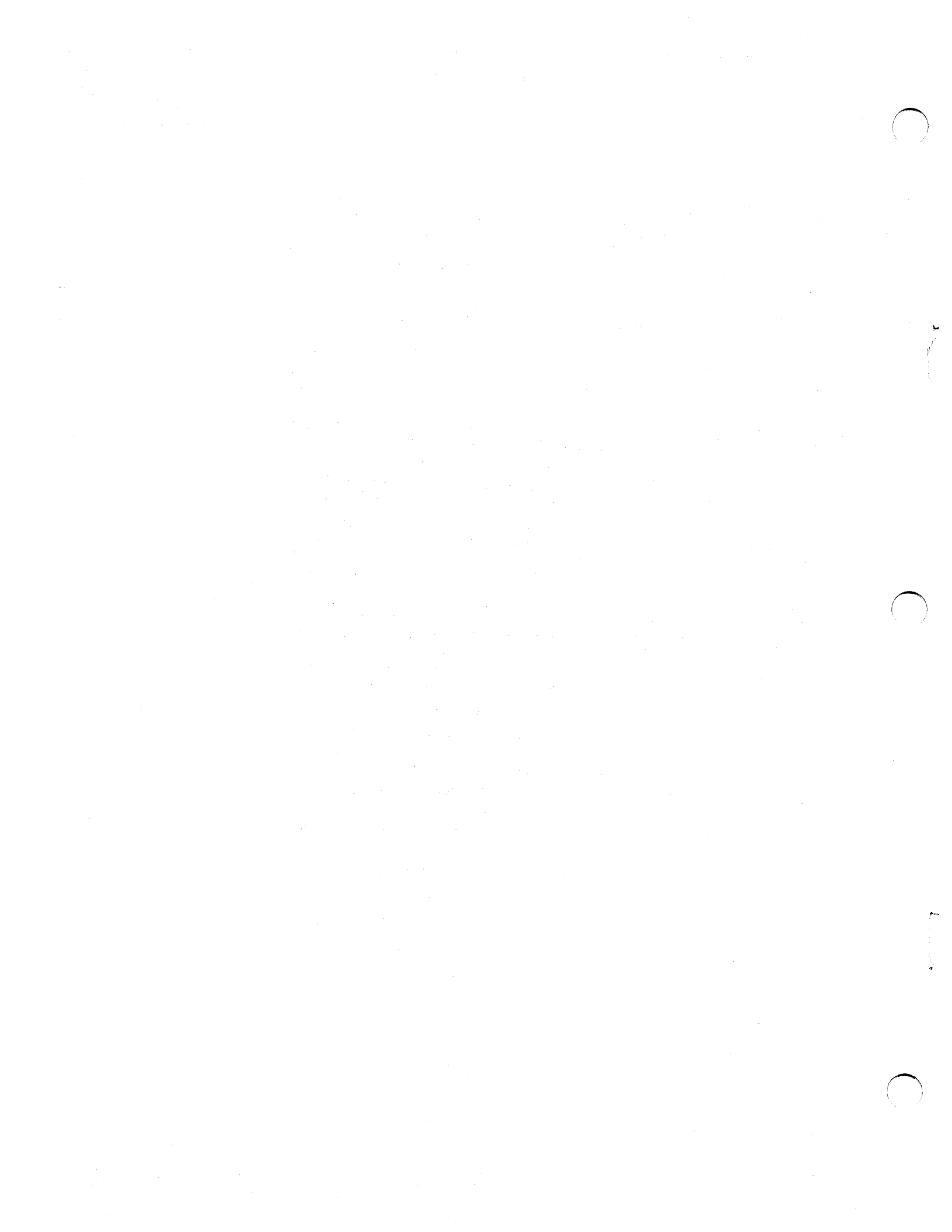
39, 40
47, 48

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

Summary of Amendments

Fuller explanation is given of special instructions for 3350 and 3380 errors.

Note: Please file this cover letter at the back of the manual to provide a record of changes.



3344 Condition 3: Temporary data checks at 1 to 10 track addresses.

Your Action	Device Support Facilities Actions	Your Response to Device Support Facilities Action
<p>Use appropriate utility or program to copy data from tracks, temporarily to another device.</p> <p>Use the following Device Support Facilities command sequence for each track.</p> <p>ANALYZE No Scan If Lastcc < 8 then INSPECT Track (cccc hhhh) - Check (1) - Assign - Preserve</p>	<p>Exercises hardware. If ANALYZE test detects hardware problem, issues diagnostic message, "Suspected Drive Problem."</p> <p>If ANALYZE test does not detect hardware problem, executes INSPECT. If data can be preserved, checks surface of tracks. Skips defect. If allowable skips are exhausted, flags the track and assigns an alternate track automatically. Rewrites HA and RO. Restores data.</p>	<p>If "Suspected Drive Problem" message, call hardware service representative for possible hardware problem.</p> <p>If INSPECT executed, and data was preserved, eliminate temporary copy.</p> <p>If data could not be preserved, you may wish to try INSPECT with No Preserve.</p>

3344 Condition 4: Permanent data checks at 11 or more track addresses.

Your Action	Device Support Facilities Actions	Your Response to Device Support Facilities Action
Call hardware service representative		

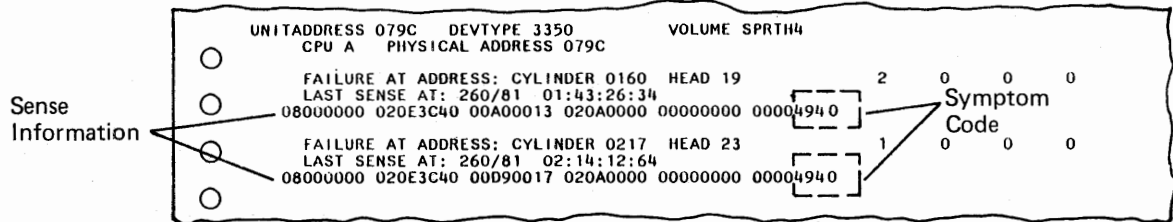
3344 Condition 5: Temporary data checks at 11 or more track addresses.

Your Action	Device Support Facilities Actions	Your Response to Device Support Facilities Action
<p>Use appropriate utility or program to copy data from volume temporarily to another device.</p> <p>Use Device Support Facilities ANALYZE No Scan If Lastcc < 8 then INIT Check (3)</p>	<p>Exercises hardware. If ANALYZE test detects hardware problem, issues diagnostic message, "Suspected Drive Problem."</p> <p>If ANALYZE test does not detect hardware problem, executes INIT. Checks surface of all tracks. Skips defects. If allowable skips are exhausted, flags the track and assigns an alternate track automatically. Rewrites HA and RO of all tracks. Rewrites volume label and VTOC.</p>	<p>If "Suspected Drive Problem" message, call hardware service representative for possible hardware problem.</p> <p>If INIT executed, restore data from temporary copy.</p>

Error Handling for 3350

Special Instructions

If permanent or temporary data checks occur on 3 to 10 tracks, examine the last four characters of the sense information for each track address. (Recall that sense information is given in the DASD Data Transfer Summary.)



These last four digits of the sense information are a symptom code. Symptom codes of 4940 and 4941 indicate errors in a home address or count area. If they are 4940 or 4941 at 3 or more tracks, special treatment is needed, as described in the table for condition 1. If you cannot copy your data, a hardware service representative may be able to help you.

If excessive temporary data checks are reported in the Subsystem Exception report, but cylinder and head numbers are not given in the DASD Data Transfer Summary, you can use the INIT command to check all of the tracks on the volume, as described in the table for condition 5.

A 3350 processing in 3330 emulation mode may be examined as a 3330 by following the specific guidelines given for the 3330. Instead of moving the pack to another drive, use the ANALYZE No Scan function to determine if there is a suspected drive problem. If checking the 3350 as a 3330 device, defects will not be skipped. However, you may wish to perform error handling as it applies to a 3350 to obtain defect skipping. To do this, follow these steps:

1. Copy the 3330 volumes to another device.
2. Call a hardware service representative to put the device in 3350 (native) mode.
3. Use the Device Support Facilities INIT command with Check (3). The program will surface-check all of the disks of the 3350 head and disk assembly, and skip any defects.
4. Have a hardware service representative put the device back into emulation mode.
5. Re-initialize the 3330 volumes using the INIT command with Validate.
6. Restore the data that was copied to another device.

Error Handling for 3375 and 3380

Special Instructions

For temporary errors, it is recommended that action be taken whenever the error rate threshold is exceeded 1 or more times. Examine the DASD Data Transfer Summary report to determine which tracks to check when the temporary threshold has been exceeded. The value in the temporary column is listed beside the address (cylinder and head numbers) where an operation was in progress when the data error rate threshold for the volume was exceeded.

Temporary errors may be recovered without offset invoked or with offset invoked. (When offset is invoked, the error is successfully recovered by retrying the operation with the head in an offset position on the track.) Treatment of temporary errors with offset invoked and without offset invoked are treated differently, as described in the condition tables. The following describes which tracks to treat under the two circumstances.

With Offset Invoked

If temporary errors are retried with offset invoked, it may be necessary to rewrite the home address. Errors recovered by retry with offset invoked are listed for the 3375 and 3380 in the DASD Data Transfer Summary under the Temporary Offset Invk Yes column. The illustration shows that offset was invoked on many scattered tracks of the volume. If offset was invoked on 3 or more tracks, special treatment is needed as described in the table for condition 1. It is recommended that surface checking also be performed.

DASD DATA TRANSFER SUMMARY		REPORT DATE 261 81		PERIOD FROM 260 81		TO 261 81	
PROBABLE FAILING UNIT - VOLUME		TEMPORARY		SENSE COUNTS		THRESHOLD	
		PERM		NO		YES	
				LOGGING			
UNIT ADDRESS 0720	DEVTYPE 3380	VOLUME ZZZZZZ					
CPU C	PHYSICAL ADDRESS XX-10-00						
FAILURE AT ADDRESS: CYLINDER 0355 HEAD 00		0	0	2	0	Offset Invoked	
LAST SENSE AT: 118/81 23:41:29:82							
00001000 008F2053 01220000 08951000 0600007A 0001C000							
FAILURE AT ADDRESS: CYLINDER 0355 HEAD 01		0	0	1	0		
LAST SENSE AT: 118/81 14:23:39:42							
00001000 008F2053 01220000 08951000 0600007A 0001C000							
FAILURE AT ADDRESS: CYLINDER 0770 HEAD 02		0	0	3	0		
LAST SENSE AT: 118/81 16:13:20:39							
00001000 00023153 01950001 08951000 06000F5A 00400000							
FAILURE AT ADDRESS: CYLINDER 0328 HEAD 05		0	0	2	0		
LAST SENSE AT: 118/81 22:34:11:07							
00001000 00481253 01480002 195C1000 0600072A 00100000							

Without Offset Invoked

The threshold for temporary data errors represents an accumulation of temporary error counts for a volume. A value other than zero in the Temporary Offset Invk No column identifies a track address where an operation was in progress when the volume exceeded the threshold. Others of the accumulated errors may have been for other tracks of the volume. Therefore, the track where the threshold was exceeded is not necessarily the one to check. Errors could have been accumulating at other tracks on the volume until a single error at this failure address caused the threshold to overflow. Once the threshold for a single volume is exceeded, all temporary data errors that occur at all volumes of the string are logged. These logged errors are shown in the Threshold Logging column.

To determine which tracks to check for temporary errors without offset invoked, refer to the examples in the illustration. *Add the value in the Temporary Offset Invk No column to the value in the Threshold Logging column.* The failure addresses with the *highest total values* are the tracks for corrective action. Refer to the three examples. In each case, the volume has exceeded the threshold two times, but the distribution of errors is different in each example. The tracks with the highest totals are indicated. When more than one track had many errors, both tracks should be checked, as in example 3. The track with address cylinder 0328, head 02 should be checked although the value in the Temporary Offset Invk No column is zero.

Example 1

DASD DATA TRANSFER SUMMARY PROBABLE FAILING UNIT - VOLUME		REPORT DATE 261 81 PERIOD FROM 260 81 TO 261 81	Logged Errors
		SENSE COUNTS	Threshold Exceeded
		TEMPORARY OFFSET INVK THRESHOLD	
		PERM NO YES LOGGING	

UNITADDRESS 0720	DEVTYPE 3380	VOLUME ZZZZZZ	
CPU C	PHYSICAL ADDRESS XX-10-00		
FAILURE AT ADDRESS: CYLINDER 0655 HEAD 00		0 0 0 2	
LAST SENSE AT: 118/81 23:41:29:82			
00001000 008F2053 01220000 08951000 0600007A 0001C000			
FAILURE AT ADDRESS: CYLINDER 0770 HEAD 01		0 2 0 15 = 17	
LAST SENSE AT: 118/81 16:13:20:39			
00001000 00023153 01950001 08951000 06000F5A 00400000			
FAILURE AT ADDRESS: CYLINDER 0328 HEAD 02		0 0 0 2	
LAST SENSE AT: 118/81 22:34:11:07			
00001000 00481253 01480002 195C1000 0600072A 00100000			
FAILURE AT ADDRESS: CYLINDER 0532 HEAD 07		0 0 0 2	
LAST SENSE AT: 118/81 23:14:05:02			
00001000 00142753 00A70007 07811000 06000284 06000000			

Example 2

UNITADDRESS 0720	DEVTYPE 3380	VOLUME ZZZZZZ	
CPU C	PHYSICAL ADDRESS XX-10-00		
FAILURE AT ADDRESS: CYLINDER 0655 HEAD 00		0 0 0 2	
LAST SENSE AT: 118/81 23:41:29:82			
00001000 008F2053 01220000 08951000 0600007A 0001C000			
FAILURE AT ADDRESS: CYLINDER 0770 HEAD 01		0 1 0 15 = 16	Highest Total Errors
LAST SENSE AT: 118/81 16:13:20:39			
00001000 00023153 01950001 08951000 06000F5A 00400000			
FAILURE AT ADDRESS: CYLINDER 0328 HEAD 02		0 1 0 2	
LAST SENSE AT: 118/81 22:34:11:07			
00001000 00481253 01480002 195C1000 0600072A 00100000			
FAILURE AT ADDRESS: CYLINDER 0532 HEAD 07		0 0 0 2	
LAST SENSE AT: 118/81 23:14:05:02			
00001000 00142753 00A70007 07811000 06000284 06000000			

Example 3

UNITADDRESS 0720	DEVTYPE 3380	VOLUME ZZZZZZ	
CPU C	PHYSICAL ADDRESS XX-10-00		
FAILURE AT ADDRESS: CYLINDER 0655 HEAD 00		0 1 0 2	
LAST SENSE AT: 118/81 23:41:29:82			
00001000 008F2053 01220000 08951000 0600007A 0001C000			
FAILURE AT ADDRESS: CYLINDER 0770 HEAD 01		0 1 0 15 = 16	
LAST SENSE AT: 118/81 16:13:20:39			
00001000 00023153 01950001 08951000 06000F5A 00400000			
FAILURE AT ADDRESS: CYLINDER 0328 HEAD 02		0 0 0 22 = 22	
LAST SENSE AT: 118/81 22:34:11:07			
00001000 00481253 01480002 195C1000 0600072A 00100000			